

A Template for Understanding
BIG DEBT CRISES

Part 1:
The Archetypal Big Debt Cycle

Acknowledgements

I cannot adequately thank the many people at Bridgewater who have shared, and continue to share, my mission to understand the markets and to test that understanding in the real world. I celebrate the meaningful work and meaningful relationships that we have had and that have led to the understandings and principles that have enriched us in the most profound ways.

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Introduction

I am writing this on the tenth anniversary of the 2008 financial crisis in order to offer the perspective of an investor who navigated that crisis well because I had developed a template for understanding how all debt crises work. I am sharing that template here in the hope of reducing the likelihood of future debt crises and helping them be better managed.

As an investor, my perspective is different from that of most economists and policy makers because I bet on economic changes via the markets that reflect them, which forces me to focus on the relative values and flows that drive the movements of capital. Those, in turn, drive these cycles. In the process of trying to navigate them, I've found there is nothing like the pain of being wrong or the pleasure of being right as a global macro investor to provide the practical lessons about economics that are unavailable in textbooks.

After repeatedly being bit by events I never encountered before, I was driven to go beyond my own personal experiences to examine all the big economic and market movements in history, and to do that in a way that would make them virtual experiences—i.e., so that they would show up to me as though I was experiencing them in real time. That way I would have to place my market bets as if I only knew what happened up until that moment. I did that by studying historical cases chronologically and in great detail, experiencing them day by day and month by month. This gave me a much broader and deeper perspective than if I had limited my perspective to my own direct experiences. Through my own experience, I went through the erosion and eventual breakdown of the global monetary system (“Bretton Woods”) in 1966–1971, the inflation bubble of the 1970s and its bursting in 1978–82, the Latin American inflationary depression of the 1980s, the Japanese bubble of the late 1980s and its bursting in 1988–1991, the global debt bubbles that led to the “tech bubble” bursting in 2000, and the Great Deleveraging of 2008. And through studying history, I experienced the collapse of the Roman Empire in the fifth century, the United States debt restructuring in 1789, Germany’s Weimar Republic in the 1920s, the global Great Depression and war that engulfed many countries in the 1930–45 period, and many other crises.

My curiosity and need to know how these things work in order to survive them in the future drove me to try to understand the cause-effect relationships behind them. I found that by examining many cases of each type of economic phenomenon (e.g., business cycles, deleveragings) and plotting the averages of each, I could better visualize and examine the cause-effect relationships of each type. That led me to create templates or archetypal models of each type—e.g., the archetypal business cycle, the archetypal big debt cycle, the archetypal deflationary deleveraging, the archetypal inflationary deleveraging, etc. Then, by noting the differences of each case within a type (e.g., each business cycle in relation to the archetypal business cycle), I could see what caused the differences. By stitching these templates together, I gained a simplified yet deep understanding of all these cases. Rather than seeing lots of individual things happening, I saw fewer things happening over and over again, like an experienced doctor who sees each case of a certain type of disease unfolding as “another one of those.”

I did the research and developed this template with the help of many great partners at Bridgewater Associates. This template allowed us to prepare better for storms that had never happened to us before, just as one who studies 100-year floods or plagues can more easily see them coming and be better prepared. We used our understanding to build computer decision-making systems that laid out in detail exactly how we’d react to virtually every possible occurrence. This approach helped us enormously. For example, eight years before the financial crisis of 2008, we built a “depression gauge” that was programmed to respond to the developments of 2007–2008, which had not occurred since 1929–32. This allowed us to do very well when most everyone else did badly.

While I won't get into Bridgewater's detailed decision making systems, in this study I will share the following: 1) my template for the "Archetypal Big Debt Cycle," 2) "Three Iconic Case Studies" examined in detail (the US in 2007–2011, which includes the "Great Recession"; the US in 1928–1937, which covers a deflationary depression; and Germany in 1918–1924, which examines an inflationary depression), and 3) a "Compendium of 48 Case Studies," which includes most of the big debt crises that happened over the last 100 years.* I guarantee that if you take the trouble to understand each of these three perspectives, you will see big debt crises very differently than you did before.

To me, watching the economy and markets, or just about anything else, on a day-to-day basis is like being in an evolving snowstorm with millions of bits and pieces of information coming at me that I have to synthesize and react to well. To see what I mean by being in the blizzard versus seeing what's happening in more synthesized ways, compare what's conveyed in Part 1 (the most synthesized/template version) with Part 2 (the most granular version), and Part 3 (the version that shows the 48 cases in chart form). If you do that, you will note how all of these cases transpire in essentially the same way as described in the archetypal case while also noting their differences, which will prompt you to ponder why these differences exist and how to explain them, which will advance your understanding. That way, when the next crisis comes along, you will be better prepared to deal with it.

To be clear, I appreciate that different people have different perspectives, that mine is just one, and that by putting our perspectives out there for debate we can all advance our understandings. I am sharing this study to do just that.

* There is also a glossary of economic terms at the start of Part 3, and for a general overview of many of the concepts contained in this study, I recommend my 30-minute animated video, "How the Economic Machine Works," which can be accessed at www.economicprinciples.org.

The Archetypal Big Debt Cycle

How I Think about Credit and Debt

Since we are going to use the terms “credit” and “debt” a lot, I’d like to start with what they are and how they work.

Credit is the giving of buying power. This buying power is granted in exchange for a promise to pay it back, which is debt. **Clearly, giving the ability to make purchases by providing credit is, in and of itself, a good thing, and not providing the power to buy and do good things can be a bad thing.** For example, if there is very little credit provided for development, then there is very little development, which is a bad thing. The problem with debt arises when there is an inability to pay it back. Said differently, **the question of whether rapid credit/debt growth is a good or bad thing hinges on what that credit produces and how the debt is repaid (i.e., how the debt is serviced).**

Almost by definition, financially responsible people don’t like having much debt. I understand that perspective well because I share it.¹ For my whole life, even when I didn’t have any money, I strongly preferred saving to borrowing, because I felt that the upsides of debt weren’t worth its downsides, which is a perspective I presume I got from my dad. I identify with people who believe that taking on a little debt is better than taking on a lot. But over time I learned that that’s not necessarily true, especially for society as a whole (as distinct from individuals), because those who make policy for society have controls that individuals don’t. From my experiences and my research, I have learned that **too little credit/debt growth can create as bad or worse economic problems as having too much, with the costs coming in the form of foregone opportunities.**

Generally speaking, **because credit creates both spending power and debt, whether or not more credit is desirable depends on whether the borrowed money is used productively enough to generate sufficient income to service the debt.** If that occurs, the resources will have been well allocated and both the lender and the borrower will benefit economically. If that doesn’t occur, the borrowers and the lenders won’t be satisfied and there’s a good chance that the resources were poorly allocated.

In assessing this for society as a whole, one should consider the secondary/indirect economics as well as the more primary/direct economics. For example, sometimes not enough money/credit is provided for such obviously cost-effective things as educating our children well (which would make them more productive, while reducing crime and the costs of incarceration), or replacing inefficient infrastructure, because of a fiscal conservatism that insists that borrowing to do such things is bad for society, which is not true.

I want to be clear that credit/debt that produces enough economic benefit to pay for itself is a good thing. But sometimes the trade-offs are harder to see. If lending standards are so tight that they require a near certainty of being paid back, that may lead to fewer debt problems but too little development. If the lending standards are looser, that could lead to more development but could also create serious debt problems down the road that erase the benefits. Let’s look at this and a few other common questions about debt and debt cycles.

How Costly Is Bad Debt Relative to Not Having the Spending That the Debt Is Financing?

Suppose that you, as a policy maker, choose to build a subway system that costs \$1 billion. You finance it with debt that you expect to be paid back from revenue, but the economics turn out to be so much worse than you expected that only half of the expected revenues come in. The debt has to be written down by 50 percent. Does that mean you shouldn’t have built the subway?

Rephrased, the question is whether the subway system is worth \$500 million more than what was initially budgeted, or, on an annual basis, whether it is worth about 2 percent more per year than budgeted, supposing the subway system has a 25-year lifespan. Looked at this way, you may well assess that having the subway system at that cost is a lot better than not having the subway system.

¹ I’m so debt averse that I’ve hardly had any debt in any form, even when I bought my first house. When I built Bridgewater, it was without debt, and I’m still a keen saver.

To give you an idea of what that might mean for an economy as a whole, really bad debt losses have been when roughly 40 percent of a loan's value couldn't be paid back. Those bad loans amount to about 20 percent of all the outstanding loans, so the losses are equal to about 8 percent of total debt. That total debt, in turn, is equal to about 200 percent of income (e.g., GDP), so the shortfall is roughly equal to 16 percent of GDP. If that cost is "socialized" (i.e., borne by the society as a whole via fiscal and/or monetary policies) and spread over 15 years, it would amount to about 1 percent per year, which is tolerable. Of course, if not spread out, the costs would be intolerable. For that reason, I am asserting that the **downside risks of having a significant amount of debt depends a lot on the willingness and the ability of policy makers to spread out the losses arising from bad debts. I have seen this in all the cases I have lived through and studied. Whether policy makers can do this depends on two factors: 1) whether the debt is denominated in the currency that they control and 2) whether they have influence over how creditors and debtors behave with each other.**

Are Debt Crises Inevitable?

Throughout history only a few well-disciplined countries have avoided debt crises. That's because lending is never done perfectly and is often done badly due to how the cycle affects people's psychology to produce bubbles and busts. While policy makers generally try to get it right, more often than not they err on the side of being too loose with credit because the near-term rewards (faster growth) seem to justify it. It is also politically easier to allow easy credit (e.g., by providing guarantees, easing monetary policies) than to have tight credit. That is the main reason we see big debt cycles.

Why Do Debt Crises Come in Cycles?

I find that whenever I start talking about cycles, particularly big, long-term cycles, people's eyebrows go up; the reactions I elicit are similar to those I'd expect if I were talking about astrology. For that reason, I want to emphasize that I am talking about *nothing more than logically-driven series of events that recur in patterns*. In a market-based economy, expansions and contractions in credit drive economic cycles, which occur for perfectly logical reasons. Though the patterns are similar, the sequences are neither pre-destined to repeat in exactly the same ways nor to take exactly the same amount of time.

To put these complicated matters into very simple terms, you create a cycle virtually anytime you borrow money. Buying something you can't afford means spending more than you make. You're not just borrowing from your lender; you are borrowing from your future self. Essentially, you are creating a time in the future in which you will need to spend less than you make so you can pay it back. The pattern of borrowing, spending more than you make, and then having to spend less than you make very quickly resembles a cycle. This is as true for a national economy as it is for an individual. Borrowing money sets a mechanical, predictable series of events into motion.

If you understand the game of Monopoly[®], you can pretty well understand how credit cycles work on the level of a whole economy. Early in the game, people have a lot of cash and only a few properties, so it pays to convert your cash into property. As the game progresses and players acquire more and more houses and hotels, more and more cash is needed to pay the rents that are charged when you land on a property that has a lot of them. Some players are forced to sell their property at discounted prices to raise that cash. So early in the game, "property is king" and later in the game, "cash is king." Those who play the game best understand how to hold the right mix of property and cash as the game progresses.

Now, let's imagine how this Monopoly[®] game would work if we allowed the bank to make loans and take deposits. Players would be able to borrow money to buy property, and, rather than holding their cash idly, they would deposit it at the bank to earn interest, which in turn would provide the bank with more money to lend. Let's also imagine that players in this game could buy and sell properties from each other on credit (i.e., by promising to pay back the money with interest at a later date). If Monopoly[®] were played this way, it would provide an almost perfect model for the way our economy operates. The amount of debt-financed spending on hotels would quickly grow to multiples of the amount of money in existence. Down the road, the debtors who hold those hotels will become short on the cash they need to pay their rents and service their debt. The bank will also get into trouble as their depositors' rising need for cash will cause them to withdraw it, even as more and more debtors are

falling behind on their payments. If nothing is done to intervene, both banks and debtors will go broke and the economy will contract. Over time, as these cycles of expansion and contraction occur repeatedly, the conditions are created for a big, long-term debt crisis.

Lending naturally creates self-reinforcing upward movements that eventually reverse to create self-reinforcing downward movements that must reverse in turn. During the upswings, lending supports spending and investment, which in turn supports incomes and asset prices; increased incomes and asset prices support further borrowing and spending on goods and financial assets. The borrowing essentially lifts spending and incomes above the consistent productivity growth of the economy. Near the peak of the upward cycle, lending is based on the expectation that the above-trend growth will continue indefinitely. But, of course, that can't happen; eventually income will fall below the cost of the loans.

Economies whose growth is significantly supported by debt-financed building of fixed investments, real estate, and infrastructure are particularly susceptible to large cyclical swings because the fast rates of building those long-lived assets are not sustainable. If you need better housing and you build it, the incremental need to build more housing naturally declines. As spending on housing slows down, so does housing's impact on growth. Let's say you have been spending \$10 million a year to build an office building (hiring workers, buying steel and concrete, etc.). When the building is finished, the spending will fall to \$0 per year, as will the demand for workers and construction materials. From that point forward, growth, income, and the ability to service debt will depend on other demand. This type of cycle—where a strong growth upswing driven by debt-financed real estate, fixed investment, and infrastructure spending is followed by a downswing driven by a debt-challenged slowdown in demand—is very typical of emerging economies because they have so much building to do.

Contributing further to the cyclicity of emerging countries' economies are changes in their competitiveness due to relative changes in their incomes. Typically, they have very cheap labor and bad infrastructure, so they build infrastructure, have an export boom, and experience rising incomes. But the rate of growth due to exports naturally slows as their income levels rise and their wage competitiveness relative to other countries declines. There are many examples of these kinds of cycles (i.e., Japan's experience over the last 70 years).

In “bubbles,” the unrealistic expectations and reckless lending results in a critical mass of bad loans. At one stage or another, this becomes apparent to bankers and central bankers and the bubble begins to deflate. One classic warning sign that a bubble is coming is when an increasing amount of money is being borrowed to make debt service payments, which of course compounds the borrowers' indebtedness.

When money and credit growth are curtailed and/or higher lending standards are imposed, the rates of credit growth and spending slow and more debt service problems emerge. At this point, the top of the upward phase of the debt cycle is at hand. Realizing that credit growth is dangerously fast, the central banks tighten monetary policy to contain it, which often accelerates the decline (though it would have happened anyway, just a bit later). In either case, when the costs of debt service become greater than the amount that can be borrowed to finance spending, the upward cycle reverses. Not only does new lending slow down, but the pressure on debtors to make their payments is increased. The clearer it becomes that debtors are struggling, the less new lending there is. The slowdown in spending and investment that results slows down income growth even further, and asset prices decline.

When borrowers cannot meet their debt service obligations to lending institutions, those lending institutions cannot meet their obligations to their own creditors. Policy makers must handle this by dealing with the lending institutions first. The most extreme pressures are typically experienced by the lenders that are the most highly leveraged and that have the most concentrated exposures to failed borrowers. These lenders pose the biggest risks of creating knock-on effects for credit worthy buyers and across the economy. Typically, they are banks, but as credit systems have grown more dynamic, a broader set of lenders has emerged, such as insurance companies, non-bank trusts, broker-dealers, and even special purpose vehicles.

The two main long-term problems that emerge from these kinds of debt cycles are:

- 1) ***The losses arising from the expected debt service payments not being made.*** When promised debt service payments can't be made, that can lead to either smaller periodic payments and/or the writing down of the value of the debt (i.e., agreeing to accept less than was owed.) If you were expecting an annual debt service payment of 4 percent and it comes in at 2 percent or 0 percent, there is that shortfall for each year, whereas if the debt is marked down, that year's loss would be much bigger (e.g., 50 percent).
- 2) ***The reduction of lending and the spending it was financing going forward.*** Even after a debt crisis is resolved, it is unlikely that the entities that borrowed too much can generate the same level of spending in the future that they had before the crisis. That has implications that must be considered.

Can Most Debt Crises Be Managed so There Aren't Big Problems?

Sometimes these cycles are moderate, like bumps in the road, and sometimes they are extreme, ending in crashes. In this study we examine ones that are extreme—i.e., all those in the last 100 years that produced declines in real GDP of more than 3 percent. Based on my examinations of them and the ways the levers available to policy makers work, I believe that it is possible for policy makers to manage them well in almost every case that the debts are denominated in a country's own currency. That is because the flexibility that policy makers have allows them to spread out the harmful consequences in such ways that big debt problems aren't really big problems. Most of the really terrible economic problems that debt crises have caused occurred before policy makers took steps to spread them out. Even the biggest debt crises in history (e.g., the 1930s Great Depression) were gotten past once the right adjustments were made. From my examination of these cases, the biggest risks are not from the debts themselves but from a) the failure of policy makers to do the right things, due to a lack of knowledge and/or lack of authority, and b) the political consequences of making adjustments that hurt some people in the process of helping others. It is from a desire to help reduce these risks that I have written this study.

Having said that, **I want to reiterate that 1) when debts are denominated in foreign currencies rather than one's own currency, it is much harder for a country's policy makers to do the sorts of things that spread out the debt problems, and 2) the fact that debt crises can be well-managed does not mean that they are not extremely costly to some people.**

The key to handling debt crises well lies in policy makers' knowing how to use their levers well and having the authority that they need to do so, knowing at what rate per year the burdens will have to be spread out, and who will benefit and who will suffer and in what degree, so that the political and other consequences are acceptable.

There are four types of levers that policy makers can pull to bring debt and debt service levels down relative to the income and cash flow levels that are required to service them:

- 1) Austerity (i.e., spending less)
- 2) Debt defaults/restructurings
- 3) The central bank "printing money" and making purchases (or providing guarantees)
- 4) Transfers of money and credit from those who have more than they need to those who have less

Each one of their levers has different impacts on the economy. Some are inflationary and stimulate growth (e.g., "printing money"), while others are deflationary and help reduce debt burdens (e.g., austerity and defaults). The key to creating a "beautiful deleveraging" (a reduction in debt/income ratios accompanied by acceptable inflation and growth rates, which I explain later) lies in striking the right balance between them. In this happy scenario, debt-to-income ratios decline at the same time that economic activity and financial asset prices improve, gradually bringing the nominal growth rate of incomes back above the nominal interest rate.

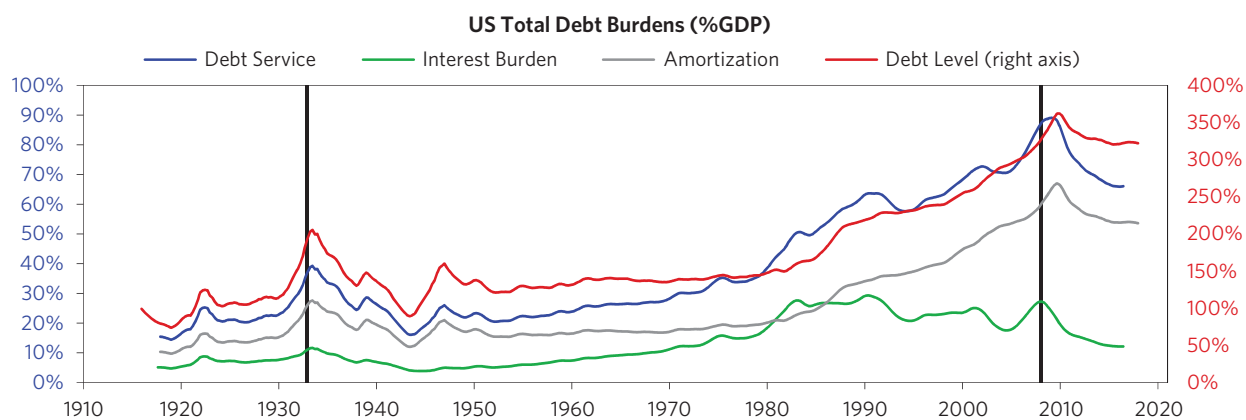
These levers shift around who benefits and who suffers, and over what amount of time. Policy makers are put in the politically difficult position of having to make those choices. As a result, they are rarely appreciated, even when they handle the debt crisis well.

The Template for the Archetypal Long-Term/Big Debt Cycle

The template that follows is based on my examination of 48 big debt cycles, which include all of the cases that led to real GDP falling by more than 3 percent in large countries (which is what I will call a depression). For clarity, I divided the affected countries into two groups: 1) Those that didn't have much of their debt denominated in foreign currency and that didn't experience inflationary depressions, and 2) those that had a significant amount of their debt denominated in foreign currency and did experience inflationary depressions. Since there was about a 75 percent correlation between the amounts of their foreign debts and the amounts of inflation that they experienced (which is not surprising, since having a lot of their debts denominated in foreign currency was a cause of their depressions being inflationary), it made sense to group those that had more foreign currency debt with those that had inflationary depressions.

Typically debt crises occur because debt and debt service costs rise faster than the incomes that are needed to service them, causing a deleveraging. While the central bank can alleviate typical debt crises by lowering real and nominal interest rates, severe debt crises (i.e., depressions) occur when this is no longer possible. Classically, a lot of short-term debt cycles (i.e., business cycles) add up to a long-term debt cycle, because each short-term cyclical high and each short-term cyclical low is higher in its debt-to-income ratio than the one before it, until the interest rate reductions that helped fuel the expansion in debt can no longer continue. The chart below shows the debt and debt service burden (both principal and interest) in the US since 1910. You will note how the interest payments remain flat or go down even when the debt goes up, so that the rise in debt service costs is not as great as the rise in debt. That is because the central bank (in this case, the Federal Reserve) lowers interest rates to keep the debt-financed expansion going until they can't do it any more (because the interest rate hits 0 percent). When that happens, the deleveraging begins.

While the chart gives a good general picture, I should make clear that it is inadequate in two respects: 1) it doesn't convey the differences between the various entities that make up these total numbers, which are very important to understand, and 2) it just shows what is called debt, so it doesn't reflect liabilities such as pension and health care obligations, which are much larger. Having this more granular perspective is very important in gauging a country's vulnerabilities, though for the most part such issues are beyond the scope of this book.



Our Examination of the Cycle

In developing the template, we will focus on the period leading up to the depression, the depression period itself, and the deleveraging period that follows the bottom of the depression. As there are two broad types of big debt crises—deflationary ones and inflationary ones (largely depending on whether a country has a lot of foreign currency debt or not)—we will examine them separately.

The statistics reflected in the charts of the phases were derived by averaging 21 deflationary debt cycle cases and 27 inflationary debt cycle cases, starting five years before the bottom of the depression and continuing for seven years after it.

Notably long-term debt cycles appear similar in many ways to short-term debt cycles, except that they are more extreme, both because the debt burdens are higher and the monetary policies that can address them are less effective. For the most part, short-term debt cycles produce bumps—mini-booms and recessions—while big long-term ones produce big booms and busts. Over the last century, the US has gone through a long-term debt crisis twice—once during the boom of the 1920s and the Great Depression of the 1930s, and again during the boom of the early 2000s and the financial crisis starting in 2008.

In the short-term debt cycle, spending is constrained only by the willingness of lenders and borrowers to provide and receive credit. When credit is easily available, there's an economic expansion. When credit isn't easily available, there's a recession. The availability of credit is controlled primarily by the central bank. The central bank is generally able to bring the economy out of a recession by easing rates to stimulate the cycle anew. But over time, each bottom and top of the cycle finishes with more economic activity than the previous cycle, and with more debt. Why? Because people push it—they have an inclination to borrow and spend more instead of paying back debt. It's human nature. As a result, over long periods of time, debts rise faster than incomes. This creates the long-term debt cycle.

During the upswing of the long-term debt cycle, lenders extend credit freely even as people become more indebted. That's because the process is self-reinforcing on the upside—rising spending generates rising incomes and rising net worths, which raises borrowers' capacities to borrow, which allows more buying and spending, etc. Most everyone is willing to take on more risk. Quite often new types of financial intermediaries and new types of financial instruments develop that are outside the supervision and protection of regulatory authorities. That puts them in a competitively attractive position to offer higher returns, take on more leverage, and make loans that have greater liquidity or credit risk. With credit plentiful, borrowers typically spend more than is sustainable, giving them the appearance of being prosperous. In turn, lenders, who are enjoying the good times, are more complacent than they should be. But debts can't continue to rise faster than the money and income that is necessary to service them forever, so they are headed toward a debt problem.

When the limits of debt growth relative to income growth are reached, the process works in reverse. Asset prices fall, debtors have problems servicing their debts, and investors get scared and cautious, which leads them to sell, or not roll over, their loans. This, in turn, leads to liquidity problems, which means that people cut back on their spending. And since one person's spending is another person's income, incomes begin to go down, which makes people even less creditworthy. Asset prices fall, further squeezing banks, while debt repayments continue to rise, making spending drop even further. The stock market crashes and social tensions rise along with unemployment, as credit and cash-starved companies reduce their expenses. The whole thing starts to feed on itself the other way, becoming a vicious, self-reinforcing contraction that's not easily corrected. Debt burdens have simply become too big and need to be reduced. Unlike in recessions, when monetary policies can be eased by lowering interest rates and increasing liquidity, which in turn increase the capacities and incentives to lend, interest rates can't be lowered in depressions. They are already at or near zero and liquidity/money can't be increased by ordinary measures.

This is the dynamic that creates long-term debt cycles. It has existed for as long as there has been credit, going back to before Roman times. Even the Old Testament described the need to wipe out debt once every 50 years, which was called the Year of Jubilee. Like most dramas, this one both arises and transpires in ways that have reoccurred throughout history.

Remember that money serves two purposes: it is a medium of exchange and a store hold of wealth. And because it has two purposes, it serves two masters: 1) those who want to obtain it for "life's necessities," usually by working for it, and 2) those who have stored wealth tied to its value. Throughout history these two groups have been called different things—e.g., the first group has been called workers, the proletariat, and "the have-nots," and the second group has been called capitalists, investors, and "the haves." For simplicity, we will call the first group proletariat-workers and the second group capitalists-investors. Proletariat-workers earn their money by selling their time and capitalists-investors earn their money by "lending" others the use of their money in exchange for either a) a promise to repay an amount of money that is greater than the loan (which is a debt instrument), or b) a piece of ownership in the business (which we call "equity" or "stocks") or a piece of another

asset (e.g., real estate). These two groups, along with the government (which sets the rules), are the major players in this drama. While generally both groups benefit from borrowing and lending, sometimes one gains and one suffers as a result of the transaction. This is especially true for debtors and creditors.

One person's financial assets are another's financial liabilities (i.e., promises to deliver money). When the claims on financial assets are too high relative to the money available to meet them, a big deleveraging must occur. Then the free-market credit system that finances spending ceases to work well, and typically works in reverse via a deleveraging, necessitating the government to intervene in a big way as the central bank becomes a big buyer of debt (i.e., lender of last resort) and the central government becomes a redistributor of spending and wealth. At such times, there needs to be a debt restructuring in which claims on future spending (i.e., debt) are reduced relative to what they are claims on (i.e., money).

This fundamental imbalance between the size of the claims on money (debt) and the supply of money (i.e., the cash flow that is needed to service the debt) has occurred many times in history and has always been resolved via some combination of the four levers I previously described. The process is painful for all of the players, sometimes so much so that it causes a battle between the proletariat-workers and the capitalists-investors. It can get so bad that lending is impaired or even outlawed. Historians say that the problems that arose from credit creation were why usury (lending money for interest) was considered a sin in both Catholicism and Islam.²

In this study we will examine big debt cycles that produce big debt crises, exploring how they work and how to deal with them well. But before we begin, I want to clarify the differences between the two main types: deflationary and inflationary depressions.

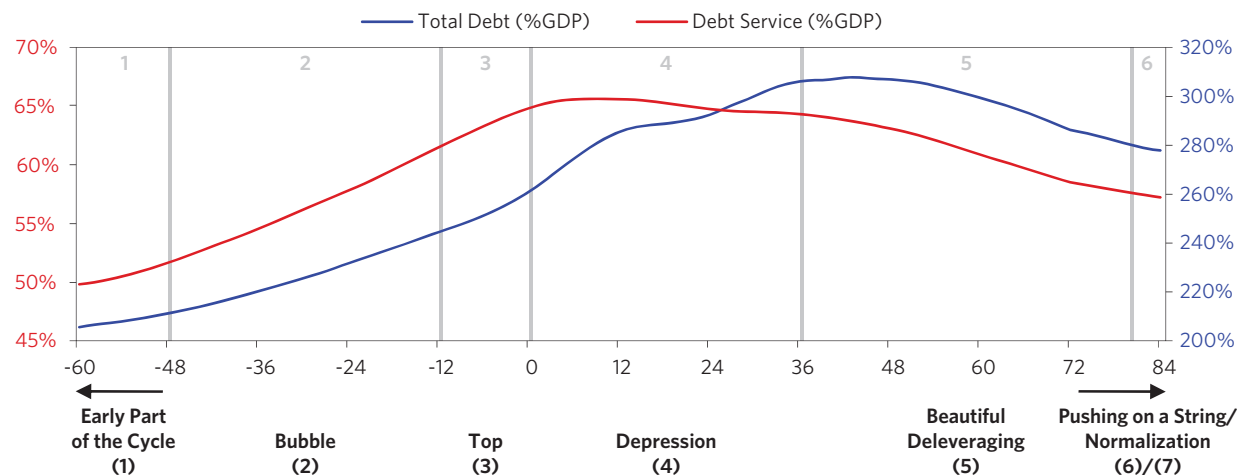
- In *deflationary depressions*, policy makers respond to the initial economic contraction by lowering interest rates. But when interest rates reach about 0 percent, that lever is no longer an effective way to stimulate the economy. Debt restructuring and austerity dominate, without being balanced by adequate stimulation (especially money printing and currency depreciation). In this phase, debt burdens (debt and debt service as a percent of income) rise, because incomes fall faster than restructuring, debt paydowns reduce the debt stock, and many borrowers are required to rack up still more debts to cover those higher interest costs. As noted, deflationary depressions typically occur in countries where most of the unsustainable debt was financed domestically in local currency, so that the eventual debt bust produces forced selling and defaults, but not a currency or a balance of payments problem.
- *Inflationary depressions* classically occur in countries that are reliant on foreign capital flows and so have built up a significant amount of debt denominated in foreign currency that can't be monetized (i.e., bought by money printed by the central bank). When those foreign capital flows slow, credit creation turns into credit contraction. In an inflationary deleveraging, capital withdrawal dries up lending and liquidity at the same time that currency declines produce inflation. Inflationary depressions in which a lot of debt is denominated in foreign currency are especially difficult to manage because policy makers' abilities to spread out the pain are more limited.

We will begin with deflationary depressions.

² Throughout the Middle Ages, Christians could generally not legally charge interest to other Christians. This is one reason why Jews played a large part in the development of trade, as they lent money for business ventures and financed voyages. But Jews were also the holders of the loans that debtors sometimes could not repay. Many historical instances of violence against Jews were driven by debt crises.

The Phases of the Classic Deflationary Debt Cycle

The chart below illustrates the seven stages of an archetypal long-term debt cycle, by tracking the total debt of the economy as a percentage of the total income of the economy (GDP) and the total amount of debt service payments relative to GDP over a period of 12 years.



Throughout this section, I'll include similar “archetype” charts that are built by averaging the deflationary deleveraging cases.³

1) The Early Part of the Cycle

In the early part of the cycle, debt is not growing faster than incomes, even though debt growth is strong. That is because debt growth is being used to finance activities that produce fast income growth. For instance, borrowed money may go toward expanding a business and making it more productive, supporting growth in revenues. Debt burdens are low and balance sheets are healthy, so there is plenty of room for the private sector, government, and banks to lever up. Debt growth, economic growth, and inflation are neither too hot nor too cold. This is what is called the “Goldilocks” period.

2) The Bubble

In the first stage of the bubble, debts rise faster than incomes, and they produce accelerating strong asset returns and growth. This process is generally self-reinforcing because rising incomes, net-worths, and asset values raise borrowers' capacities to borrow. This happens because lenders determine how much they can lend on the basis of the borrowers' 1) projected income/cash flows to service the debt, 2) net worth/collateral (which rises as asset prices rise), and 3) their own capacities to lend. All of these rise together. Though this set of conditions is not sustainable because the debt growth rates are increasing faster than the incomes that will be required to service them, borrowers feel rich, so they spend more than they earn and buy assets at high prices with leverage. Here's one example of how that happens:

Suppose you earn \$50,000 a year and have a net worth of \$50,000. You have the capacity to borrow \$10,000 per year, so you could spend \$60,000 per year for a number of years, even though you only earn \$50,000. For an economy as a whole, increased borrowing and spending can lead to higher incomes, and rising stock valuations and other asset values, giving people more collateral to borrow against. People then borrow more and more, but as long as the borrowing drives growth, it is affordable.

³ Archetype charts are sensitive to outliers, especially for metrics like inflation that vary widely. For each chart, we excluded roughly the third of cases that were least related to the average.

In this up-wave part of the long-term debt cycle, promises to deliver money (i.e., debt burdens) rise relative to both the supply of money in the overall economy and the amount of money and credit debtors have coming in (via incomes, borrowing, and sales of assets). This up-wave typically goes on for decades, with variations primarily due to central banks' periodic tightenings and easings of credit. These are short-term debt cycles, and a bunch of them generally add up to a long-term debt cycle.

A key reason the long-term debt cycle can be sustained for so long is that central banks progressively lower interest rates, which raises asset prices and, in turn, people's wealth, because of the present value effect that lowering interest rates has on asset prices. This keeps debt service burdens from rising, and it lowers the monthly payment cost of items bought on credit. But this can't go on forever. Eventually the debt service payments become equal to or larger than the amount debtors can borrow, and the debts (i.e., the promises to deliver money) become too large in relation to the amount of money in existence there is to give. When promises to deliver money (i.e., debt) can't rise any more relative to the money and credit coming in, the process works in reverse and deleveraging begins. Since borrowing is simply a way of pulling spending forward, the person spending \$60,000 per year and earning \$50,000 per year has to cut his spending to \$40,000 for as many years as he spent \$60,000, all else being equal.

Though a bit of an oversimplification, this is the essential dynamic that drives the inflating and deflating of a bubble.

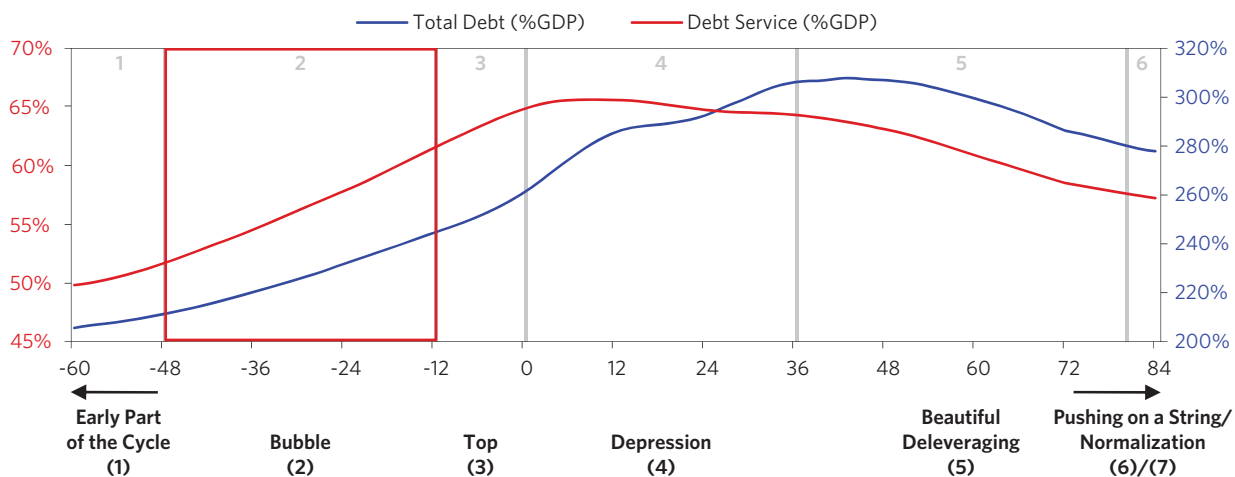
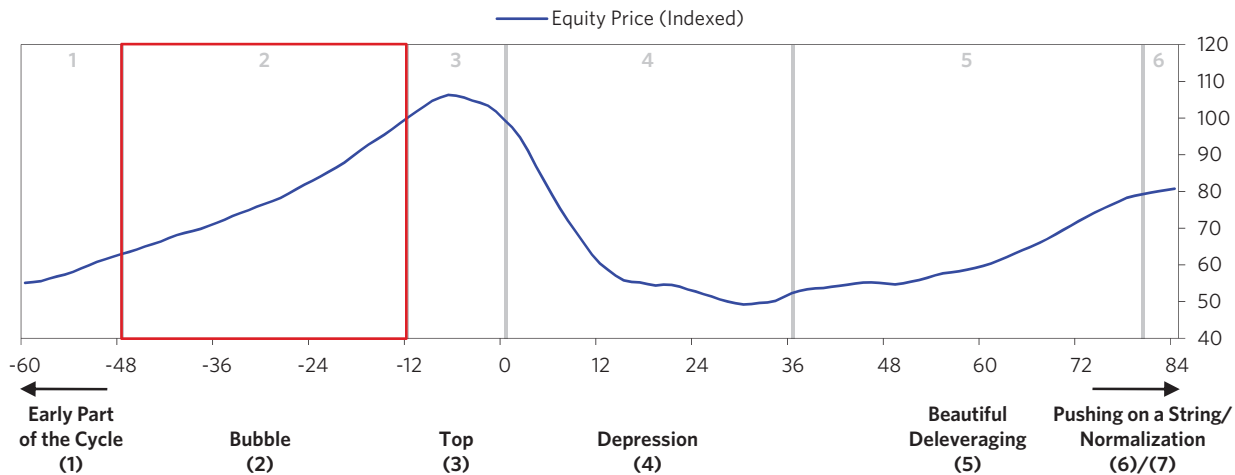
The Start of a Bubble: The Bull Market

Bubbles usually start as over-extrapolations of justified bull markets. The bull markets are initially justified because lower interest rates make investment assets, such as stocks and real estate, more attractive so they go up, and economic conditions improve, which leads to economic growth and corporate profits, improved balance sheets, and the ability to take on more debt—all of which make the companies worth more.

As assets go up in value, net worths and spending/income levels rise. Investors, business people, financial intermediaries, and policy makers increase their confidence in ongoing prosperity, which supports the leveraging-up process. The boom also encourages new buyers who don't want to miss out on the action to enter the market, fueling the emergence of a bubble. Quite often, uneconomic lending and the bubble occur because of implicit or explicit government guarantees that encourage lending institutions to lend recklessly.

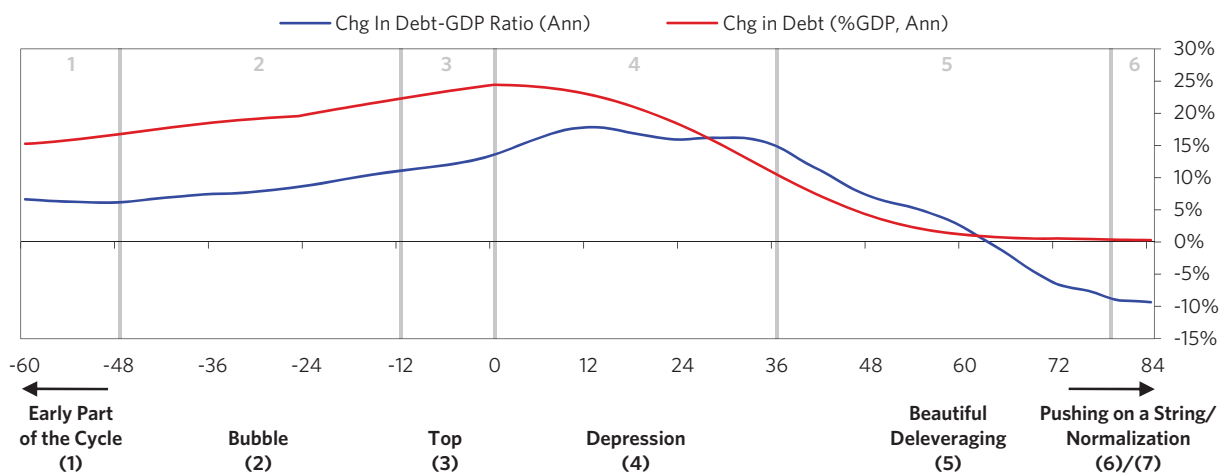
As new speculators and lenders enter the market and confidence increases, credit standards fall. Banks lever up and new types of lending institutions that are largely unregulated develop (these non-bank lending institutions are referred to collectively as a "shadow banking" system). These shadow banking institutions are typically less under the blanket of government protections. At these times, new types of lending vehicles are frequently invented and a lot of financial engineering takes place.

The lenders and the speculators make a lot of fast, easy money, which reinforces the bubble by increasing the speculators' equity, giving them the collateral they need to secure new loans. At the time, most people don't think that is a problem; to the contrary, they think that what is happening is a reflection and confirmation of the boom. This phase of the cycle typically feeds on itself. Taking stocks as an example, rising stock prices lead to more spending and investment, which raises earnings, which raises stock prices, which lowers credit spreads and encourages increased lending (based on the increased value of collateral and higher earnings), which affects spending and investment rates, etc. During such times, most people think the assets are a fabulous treasure to own—and consider anyone who doesn't own them to be missing out. As a result of this dynamic, all sorts of entities build up long positions. Large asset-liability mismatches increase in the forms of a) borrowing short-term to lend long-term, b) taking on liquid liabilities to invest in illiquid assets, and c) investing in riskier debt or other risky assets with money borrowed from others, and/or d) borrowing in one currency and lending in another, all to pick up a perceived spread. All the while, debts rise fast and debt service costs rise even faster. The charts below paint the picture.



In markets, when there's a consensus, it gets priced in. This consensus is also typically believed to be a good rough picture of what's to come, even though history has shown that the future is likely to turn out differently than expected. In other words, humans by nature (like most species) tend to move in crowds and weigh recent experience more heavily than is appropriate. In these ways, and because the consensus view is reflected in the price, extrapolation tends to occur.

At such times, increases in debt-to-income ratios are very rapid. The above chart shows the archetypal path of debt as a percent of GDP for the deflationary deleveragings we averaged. The typical bubble sees leveraging up at an average rate of 20 to 25 percent of GDP over three years or so. The blue line depicts the arc of the long-term debt cycle in the form of the total debt of the economy divided by the total income of the economy as it passes through its various phases; the red line charts the total amount of debt service payments relative to the total amount of income.



Bubbles are most likely to occur at the tops in the business cycle, balance of payments cycle, and/or long-term debt cycle. As a bubble nears its top, the economy is most vulnerable, but people are feeling the wealthiest and the most bullish. In the cases we studied, total debt-to-income levels averaged around 300 percent of GDP. To convey a few rough average numbers, below we show some key indications of what the archetypal bubble looks like:

Conditions During the Bubble

	Change During Bubble	Range
1 Debt growing faster than incomes	40%	14% to 79%
Debt growing rapidly	32%	17% to 45%
Income growth high but slower than debt	13%	8% to 20%
2 Equity markets extend rally	48%	22% to 68%
3 Yield curve flattens (SR - LR)	1.4%	0.9% to 1.7%

The Role of Monetary Policy

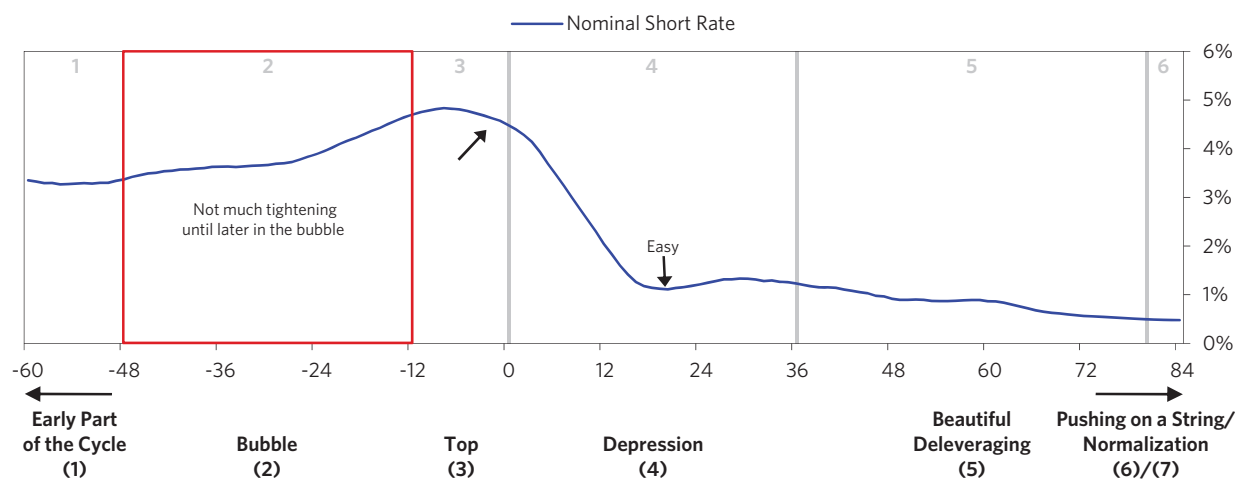
In many cases, **monetary policy helps inflate the bubble rather than constrain it**. This is especially true when inflation and growth are both good and investment returns are great. Such periods are typically interpreted to be a productivity boom that reinforces investor optimism as they leverage up to buy investment assets. In such cases, central banks, focusing on inflation and growth, are often reluctant to adequately tighten money. This is what happened in Japan in the late 1980s, and in much of the world in the late 1920s and mid-2000s.

This is one of the biggest problems with most central bank policies—i.e., because central bankers target either inflation or inflation and growth and don't target the management of bubbles, the debt growth that they enable can go to finance the creation of bubbles if inflation and real growth don't appear to be too strong. In my opinion it's very important for central banks to target debt growth with an eye toward keeping it at a sustainable level—i.e., at a level where the growth in income is likely to be large enough to service the debts regardless of what credit is used to buy. Central bankers sometimes say that it is too hard to spot bubbles and that it's not their role to assess and control them—that it is their job to control inflation and growth.⁴ But what they control is money and credit, and when that money and credit goes into debts that can't be paid back, that has huge implications for growth and inflation down the road. The greatest depressions occur when bubbles burst, and if the central banks that are producing the debts that are inflating them won't control them, then who will? The economic pain of allowing a large bubble to inflate and then burst is so high that it is imprudent for policy makers to ignore them, and I hope their perspective will change.

⁴ In the US, the central bank doesn't take this debt service perspective as it applies to investment assets into consideration—e.g., it's nowhere to be found in the Taylor Rule.

While central banks typically do tighten money somewhat and short rates rise on average when inflation and growth start to get too hot, typical monetary policies are not adequate to manage bubbles, because bubbles are occurring in some parts of the economy and not others. Thinking about the whole economy, central banks typically fall behind the curve during such periods, and borrowers are not yet especially squeezed by higher debt-service costs. Quite often at this stage, their interest payments are increasingly being covered by borrowing more rather than by income growth—a clear sign that the trend is unsustainable.

All this reverses when the bubble pops and the same linkages that inflated the bubble make the downturn self-reinforcing. Falling asset prices decrease both the equity and collateral values of leveraged speculators, which causes lenders to pull back. This forces speculators to sell, driving down prices even more. Also, lenders and investors “run” (i.e., withdraw their money) from risky financial intermediaries and risky investments, causing them to have liquidity problems. Typically, the affected market or markets are big enough and leveraged enough that the losses on the accumulated debt are systemically threatening, which is to say that they threaten to topple the entire economy.



Spotting Bubbles

While the particulars may differ across cases (e.g., the size of the bubble; whether it’s in stocks, housing, or some other asset⁵; how exactly the bubble pops; and so on), the many cases of bubbles are much more similar than they are different, and each is a result of logical cause-and-effect relationships that can be studied and understood. If one holds a strong mental map of how bubbles form, it becomes much easier to identify them.

To identify a big debt crisis before it occurs, I look at all the big markets and see which, if any, are in bubbles. Then I look at what’s connected to them that would be affected when they pop. While I won’t go into exactly how it works here, the most defining characteristics of bubbles that can be measured are:

- 1) Prices are high relative to traditional measures
- 2) Prices are discounting future rapid price appreciation from these high levels
- 3) There is broad bullish sentiment
- 4) Purchases are being financed by high leverage
- 5) Buyers have made exceptionally extended forward purchases (e.g., built inventory, contracted for supplies, etc.) to speculate or to protect themselves against future price gains
- 6) New buyers (i.e., those who weren’t previously in the market) have entered the market
- 7) Stimulative monetary policy threatens to inflate the bubble even more (and tight policy to cause its popping)

⁵ In the 2008 crisis in the US, residential and commercial real estate, private equity, lower grade credits and, to a lesser extent, listed equities were the assets that were bought at high prices and on lots of leverage. During both the US Great Depression and the Japanese deleveraging, stocks and real estate were also the assets of choice that were bought at high prices and on leverage.

As you can see in the table below, which is based on our systematic measures, most or all of these indications were present in past bubbles. (N/A indicates inadequate data.)

Applying the Framework to Past Bubbles

	USA 2007	USA 2000	USA 1929	Japan 1989	Spain 2007	Greece 2007	Ireland 2007	Korea 1994	HK 1997	China 2015
1 Are prices high relative to traditional measures?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
2 Are prices discounting future rapid price appreciation?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
3 Are purchases being financed by high leverage?	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	N/A	Yes
4 Are buyers/companies making forward purchases?	Yes	Yes	N/A	Yes	No	Yes	No	Yes	Yes	No
5 Have new participants entered the market?	Yes	Yes	N/A	Yes	No	Yes	Yes	Yes	N/A	Yes
6 Is there broad bullish sentiment?	Yes	Yes	N/A	Yes	No	No	No	N/A	N/A	Yes
7 Does tightening risk popping the bubble?	Yes	Yes	Yes	Yes	Yes	Yes	No	No	Yes	Yes

At this point I want to emphasize that it is a mistake to think that any one metric can serve as an indicator of an impending debt crisis. The ratio of debt to income for the economy as a whole, or even debt service payments to income for the economy as a whole, which is better, are useful but ultimately inadequate measures. To anticipate a debt crisis well, one has to look at the specific debt-service abilities of the individual entities, which are lost in these averages. More specifically, a high level of debt or debt service to income is less problematic if the average is well distributed across the economy than if it is concentrated—especially if it is concentrated in key entities.

3) The Top

When prices have been driven by a lot of leveraged buying and the market gets fully long, leveraged, and overpriced, it becomes ripe for a reversal. This reflects a general principle: When things are so good that they can't get better—yet everyone believes that they will get better—tops of markets are being made.

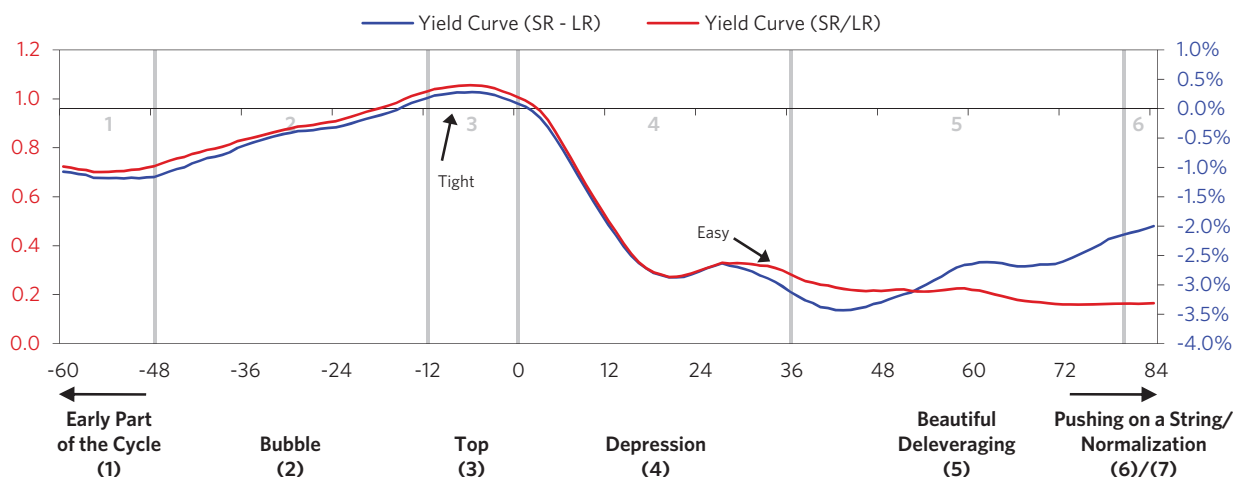
While tops are triggered by different events, most often they occur when the central bank starts to tighten and interest rates rise. In some cases the tightening is brought about by the bubble itself, because growth and inflation are rising while capacity constraints are beginning to pinch. In other cases, the tightening is externally driven. For example, for a country that has become reliant on borrowing from external creditors, the pulling back of lending due to exogenous causes will lead to liquidity tightening. A tightening of monetary policy in the currency in which debts are denominated can be enough to cause foreign capital to pull back. This can happen for reasons unrelated to conditions in the domestic economy (e.g., cyclical conditions in a reserve currency country leads to a tightening in liquidity in that currency, or a financial crisis results in a pullback of capital, etc.). Also, a rise in the currency the debt is in relative to the currency incomes are in can cause an especially severe squeeze. Sometimes unanticipated shortfalls in cash flows due to any number of reasons can trigger the debt crises.

Whatever the cause of the debt-service squeeze, it hurts asset prices (e.g., stock prices), which has a negative “wealth effect”⁶ as lenders begin to worry that they might not be able to get their cash back from those they lent it to. Borrowers are squeezed as an increasing share of their new borrowing goes to pay debt service and/or isn't rolled over and their spending slows down. This is classically the result of people buying investment assets at high prices with leverage, based on overly optimistic assumptions about future cash flow. Typically, these types of credit/debt problems start to emerge about half a year ahead of the peak in the economy, at first in its most vulnerable and frothy pockets. The riskiest debtors start to miss payments, lenders begin to worry, credit spreads start to tick up, and risky lending slows. Runs from risky assets to less risky assets pick up, contributing to a broadening of the contraction.

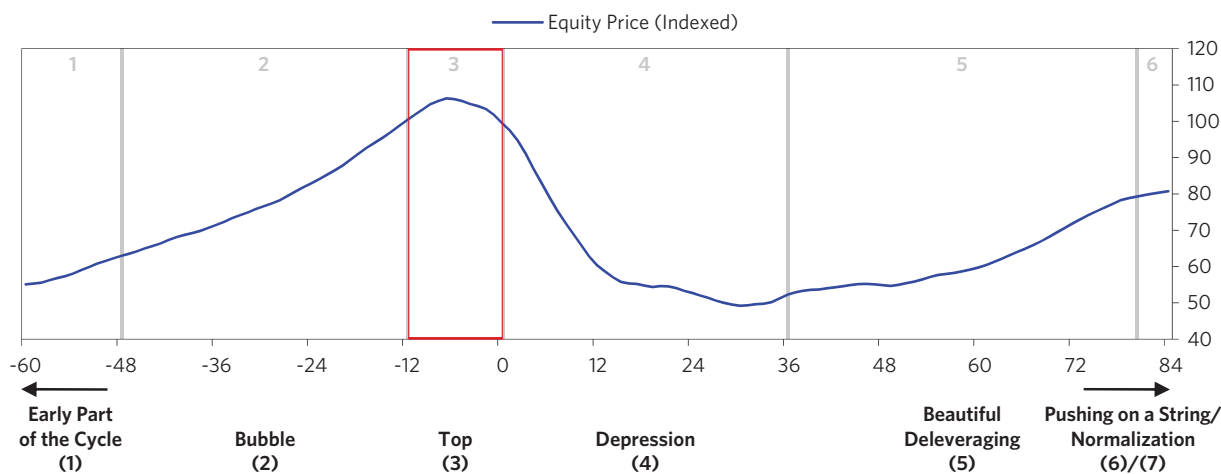
Typically, in the early stages of the top, the rise in short rates narrows or eliminates the spread with long rates (i.e., the extra interest rate earned for lending long term rather than short term), lessening the incentive to lend relative to the incentive to hold cash. As a result of the yield curve being flat or inverted (i.e., long-term interest

⁶ A negative “wealth effect” occurs when one's wealth declines, which leads to less lending and spending. This is due to both negative psychology of worry and worse financial conditions leading to borrowers having less collateral, which leads to less lending.

rates are at their lowest relative to short-term interest rates), people are incentivized to move to cash just before the bubble pops, slowing credit growth and causing the previously described dynamic.



Early on in the top, some parts of the credit system suffer, but others remain robust, so it isn't clear that the economy is weakening. So while the central bank is still raising interest rates and tightening credit, the seeds of the recession are being sown. The fastest rate of tightening typically comes about five months prior to the top of the stock market. The economy is then operating at a high rate, with demand pressing up against the capacity to produce. Unemployment is normally at cyclical lows and inflation rates are rising. The increase in short-term interest rates makes holding cash more attractive, and it raises the interest rate used to discount the future cash flows of assets, weakening riskier asset prices and slowing lending. It also makes items bought on credit de facto more expensive, slowing demand. Short rates typically peak just a few months before the top in the stock market.

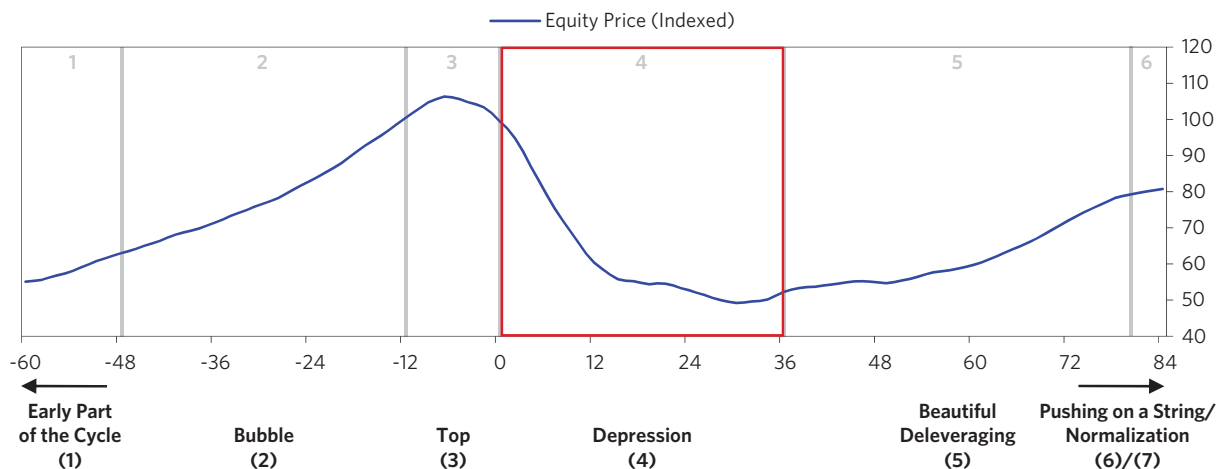


The more leverage that exists and the higher the prices, the less tightening it takes to prick the bubble and the bigger the bust that follows. To understand the magnitude of the downturn that is likely to occur, it is less important to understand the magnitude of the tightening than it is to understand each particular sector's sensitivity to tightening and how losses will cascade. These pictures are best seen by looking at each of the important sectors of the economy and each of the big players in these sectors rather than at economy-wide averages.

In the immediate postbubble period, the wealth effect of asset price movements has a bigger impact on economic growth rates than monetary policy does. People tend to underestimate the size of this effect. In the early stages of a bubble bursting, when stock prices fall and earnings have not yet declined, people mistakenly judge the

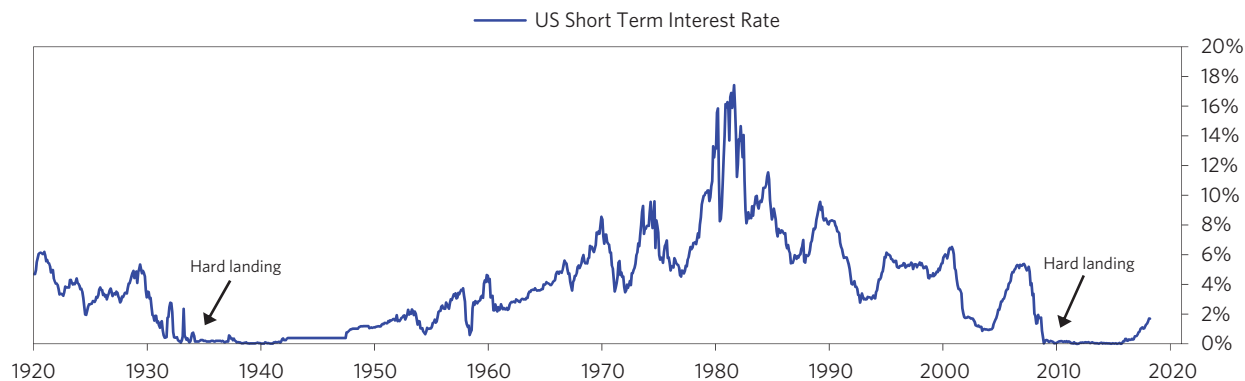
decline to be a buying opportunity and find stocks cheap in relation to both past earnings and expected earnings, failing to account for the amount of decline in earnings that is likely to result from what's to come. But the reversal is self-reinforcing. As wealth falls first and incomes fall later, creditworthiness worsens, which constricts lending activity, which hurts spending and lowers investment rates while also making it less appealing to borrow to buy financial assets. This in turn worsens the fundamentals of the asset (e.g., the weaker economic activity leads corporate earnings to chronically disappoint), leading people to sell and driving down prices further. This has an accelerating downward impact on asset prices, income, and wealth.

4) The “Depression”

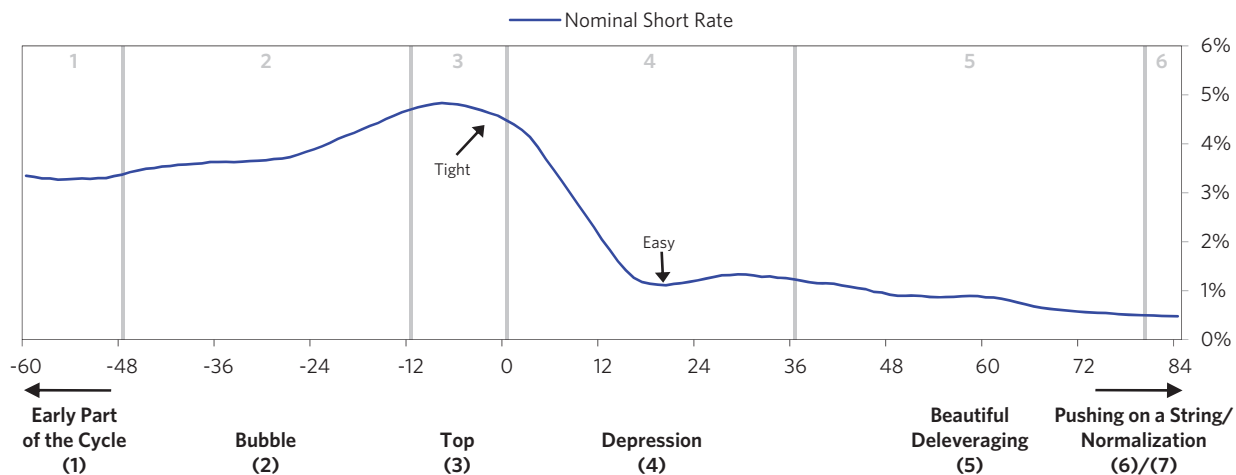


In normal recessions (when monetary policy is still effective), the imbalance between the amount of money and the need for it to service debt can be rectified by cutting interest rates enough to 1) produce a positive wealth effect, 2) stimulate economic activity, and 3) ease debt-service burdens. This can't happen in depressions, because interest rates can't be cut materially because they have either already reached close to 0 percent or, in cases where currency outflows and currency weaknesses are great, the floor on interest rates is higher because of credit or currency risk considerations.

This is precisely the formula for a depression. As shown, this happened in the early stage of both the 1930–32 depression and the 2008–09 depression. In well managed cases, like the US in 2007–08, the Fed lowered rates very quickly and then, when that didn't work, moved on to alternative means of stimulating, having learned from its mistakes in the 1930s when the Fed was slower to ease and even tightened at times to defend the dollar's peg to gold.



The chart below shows the sharp lowering of interest rates toward 0 percent for the average of the 21 deflationary debt crises that we looked at.



As the depression begins, debt defaults and restructurings hit the various players, especially leveraged lenders (e.g., banks), like an avalanche. Both lenders' and depositors' justified fears feed on themselves, leading to runs on financial institutions that typically don't have the cash to meet them unless they are under the umbrella of government protections. Cutting interest rates doesn't work adequately because the floors on risk-free rates have already been hit and because as credit spreads rise, the interest rates on risky loans go up, making it difficult for those debts to be serviced. Interest rate cuts also don't do much to help lending institutions that have liquidity problems and are suffering from runs. At this phase of the cycle, debt defaults and austerity (i.e., the forces of deflation) dominate, and are not sufficiently balanced with the stimulative and inflationary forces of printing money to cover debts (i.e., debt monetization).

With investors unwilling to continue lending and borrowers scrambling to find cash to cover their debt payments, liquidity—i.e., the ability to sell investments for money—becomes a major concern. As an illustration, when you own a \$100,000 debt instrument, you presume that you will be able to exchange it for \$100,000 in cash and, in turn, exchange the cash for \$100,000 worth of goods and services. However since the ratio of financial assets to money is high, when a large number of people rush to convert their financial assets into money and buy goods and services in bad times, the central bank either has to provide the liquidity that's needed by printing more money or allow a lot of defaults.

The depression can come from, or cause, either solvency problems or cash-flow problems. Usually a lot of both types of problems exist during this phase. A solvency problem means that, according to accounting and regulatory rules, the entity does not have enough equity capital to operate—i.e., it is “broke” and must be shut down. So, the accounting laws have a big impact on the severity of the debt problem at this moment. A cash-flow problem means that an entity doesn't have enough cash to meet its needs, typically because its own lenders are taking money away from it—i.e., there is a “run.” A cash-flow problem can occur even when the entity has adequate capital because the equity is in illiquid assets. Lack of cash flow is an immediate and severe problem—and as a result, the trigger and main issue of most debt crises.

Each kind of problem requires a different approach. If a solvency problem exists (i.e., the debtor doesn't have enough equity capital), it has an accounting/regulatory problem that can be dealt with by either a) providing enough equity capital or b) changing the accounting/regulatory rules, which hides the problem. Governments can do this directly through fiscal policy or indirectly through clever monetary policies if the debt is in their own currency. Similarly, if a cash-flow problem exists, fiscal and/or monetary policy can provide either cash or guarantees that resolve it.

A good example of how these forces are relevant is highlighted by the differences between the debt/banking crises of the 1980s and 2008. In the 1980s, there was not as much mark-to-market accounting (because the crisis involved loans that weren't traded every day in public markets), so the banks were not as "insolvent" as they were in 2008. With more mark-to-market accounting in 2008, the banks required capital injections and/or guarantees to improve their balance sheets. Both crises were successfully managed, though the ways they were managed had to be different.

Going into the "depression" phase of the cycle (by which I mean the severe contraction phase) some protections learned from past depressions (e.g., bank-deposit insurance, the ability to provide lender-of-last-resort financial supports and guarantees and to inject capital into systemically important institutions or nationalize them) are typically in place and are helpful, but they are rarely adequate, because the exact nature of the debt crisis hasn't been well thought through. Typically, quite a lot of lending has taken place in the relatively unregulated "shadow banking system," or in new instruments that have unanticipated risks and inadequate regulations. What happens in response to these new realities depends on the capabilities of the policy makers in the decision roles and the freedom of the system to allow them to do what is best.

Some people mistakenly think that depressions are psychological: that investors move their money from riskier investments to safer ones (e.g., from stocks and high-yield lending to government bonds and cash) because they're scared, and that the economy will be restored if they can only be coaxed into moving their money back into riskier investments. This is wrong for two reasons: First, contrary to popular belief, the deleveraging dynamic is not primarily psychological. It is mostly driven by the supply and demand of, and the relationships between, credit, money, and goods and services—though psychology of course also does have an effect, especially in regard to the various players' liquidity positions. Still, if everyone went to sleep and woke up with no memory of what had happened, we would be in the same position, because debtors' obligations to deliver money would be too large relative to the money they are taking in. The government would still be faced with the same choices that would have the same consequences, and so on.

Related to this, if the central bank produces more money to alleviate the shortage, it will cheapen the value of money, making a reality of creditors' worries about being paid back an amount of money that is worth less than what they loaned. While some people think that the amount of money in existence remains the same and simply moves from riskier assets to less risky ones, that's not true. Most of what people think is money is really credit, and credit does appear out of thin air during good times and then disappear at bad times. For example, when you buy something in a store on a credit card, you essentially do so by saying, "I promise to pay." Together you and the store owner create a credit asset and a credit liability. So where do you take the money from? Nowhere. You created credit. It goes away in the same way. Suppose the store owner rightly believes that you and others won't pay the credit card company and that the credit card company won't pay him. Then he correctly believes that the credit "asset" he has isn't really there. It didn't go somewhere else; it's simply gone.

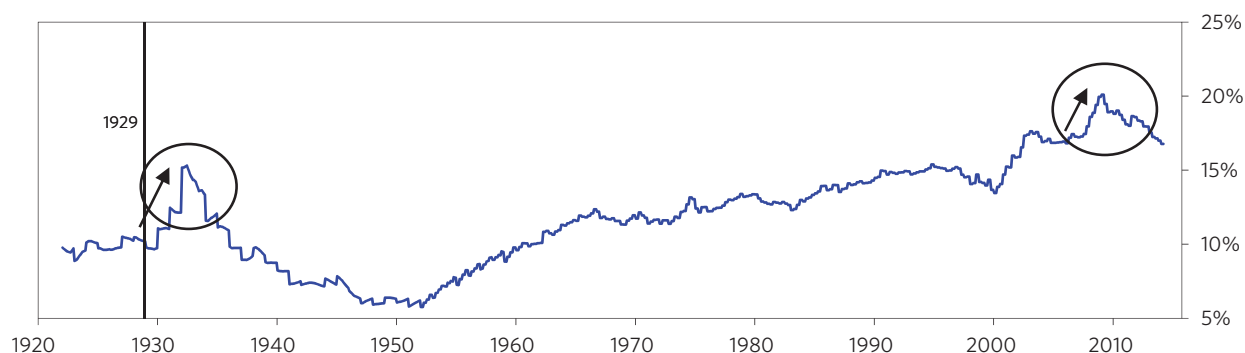
As this implies, a big part of the deleveraging process is people discovering that much of what they thought of as their wealth was merely people's promises to give them money. Now that those promises aren't being kept, that wealth no longer exists. When investors try to convert their investments into money in order to raise cash, they test their ability to get paid, and in cases where it fails, panic-induced "runs" and sell-offs of securities occur. Naturally those who experience runs, especially banks (though this is true of most entities that rely on short-term funding), have problems raising money and credit to meet their needs, so debt defaults cascade.

Debt defaults and restructurings hit people, especially leveraged lenders (e.g., banks), and fear cascades through the system. These fears feed on themselves and lead to a scramble for cash that results in a shortage (i.e., a liquidity crisis). The dynamic works like this: Initially, the money coming in to debtors via incomes and borrowing is not enough to meet the debtors' obligations; assets need to be sold and spending needs to be cut in order to raise cash. This leads asset values to fall, which reduces the value of collateral, and in turn reduces incomes. Since borrowers' creditworthiness is judged by both a) the values of their assets/collaterals in relation to their debts (i.e., their net worth) and b) the sizes of their incomes relative to the sizes of their debt-service payments, and since both their net worth and their income fall faster than their debts, borrowers become less creditworthy and lenders more reluctant to lend. This goes on in a self-reinforcing manner.

The depression phase is dominated by the deflationary forces of debt reduction (i.e., defaults and restructurings) and austerity occurring without material efforts to reduce debt burdens by printing money. Because one person's debts are another's assets, the effect of aggressively cutting the value of those assets can be to greatly reduce the demand for goods, services, and investment assets. For a write-down to be effective, it must be large enough to allow the debtor to service the restructured loan. If the write-down is 30 percent, then the creditor's assets are reduced by that much. If that sounds like a lot, it's actually much more. Since most lenders are leveraged (e.g., they borrow to buy assets), the impact of a 30 percent write-down on their net worth can be much greater. For example, the creditor who is leveraged 2:1 would experience a 60 percent decline in his net worth (i.e., their assets are twice their net worth, so the decline in asset value has twice the impact).⁷ Since banks are typically leveraged about 12:1 or 15:1, that picture is obviously devastating for them and for the economy as a whole.

Even as debts are written down, debt burdens rise as spending and incomes fall. Debt levels also rise relative to net worth, as shown in the chart below. As debt-to-income and debt-to-net-worth ratios go up and the availability of credit goes down, naturally the credit contraction becomes self-reinforcing on the downside.

Household Debt as a % of Net Worth



The capitalists-investor class experiences a tremendous loss of “real” wealth during depressions because the value of their investment portfolios collapses (declines in equity prices are typically around 50 percent), their earned incomes fall, and they typically face higher tax rates. As a result, they become extremely defensive. Quite often, they are motivated to move their money out of the country (which contributes to currency weakness), dodge taxes, and seek safety in liquid, noncredit-dependent investments (e.g., low-risk government bonds, gold, or cash).

Of course, the real economy as well as the financial economy suffers. With monetary policy constrained, the uncontrolled credit contraction produces an economic and social catastrophe. Workers suffer as incomes collapse and job losses are severe. Hard-working people who once were able to provide for their families lose the opportunity to have meaningful work and suddenly become either destitute or dependent. Homes are lost because owners can no longer afford to pay their mortgages, retirement accounts are wiped out, and savings for college are lost. These conditions can persist for many years if policy makers don't offset the depression's deflationary forces with sufficient monetary stimulation of a new form.

Managing Depressions

As mentioned earlier, the policies that reduce debt burdens fall under four broad categories: 1) austerity, 2) debt defaults/restructurings, 3) debt monetization/money printing, and 4) wealth transfers (i.e., from the haves to the

⁷ Here's how the math works. If you're leveraged 2:1, the value of your assets is twice your net worth. To put numbers on it, say you own \$100 of assets and your debts are \$50. In that case, your net worth is \$50. If the value of your assets falls by 30 percent, you're left with \$70 of assets and \$50 of debt. Your net worth is now \$20. That's 60 percent less than the net worth of \$50 you started with, even though your assets only fell 30 percent. Being leveraged 2:1 doubles the impact of the asset price decline on your net worth (similarly 3:1 leverage would triple it, and so on).

have-nots). By using these kinds of levers well, policy makers can mitigate the worst effects of a depression and manage both the failed lenders and borrowers and the economic conditions. But it's important to recognize that each of these levers has different impacts on the economy and creditworthiness. The key is to get the mix right, so that deflationary and depressive forces are balanced with inflationary and stimulative ones.

Policy makers typically get the mix between austerity, money printing, and redistribution wrong initially. Taxpayers are understandably angry at the debtors and at the financial institutions whose excesses caused the debt crisis, and don't want the government (i.e., their taxes) to bail them out. And policy makers justifiably believe that debt excesses will happen again if lenders and borrowers don't suffer the downsides of their actions (which is called the "moral hazard" problem). For all these reasons, policy makers are usually reluctant and slow to provide government supports, and the debt contraction and the agony it produces increase quickly. But the longer they wait to apply stimulative remedies to the mix, the uglier the deleveraging becomes.⁸ Eventually they choose to provide a lot of guarantees, print a lot of money, and monetize a lot of debt, which lifts the economy into a reflationary deleveraging. If they do these things and get the mix right quickly, the depression is much more likely to be relatively short-lived (like the short period of "depression" following the US crisis in 2008). If they don't, the depression is usually prolonged (like the Great Depression in the 1930s, or Japan's "lost decade" following its bubble in the late 1980s).

To reiterate, the two biggest impediments to managing a debt crisis are: a) the failure to know how to handle it well and b) politics or statutory limitations on the powers of policy makers to take the necessary actions. In other words, *ignorance and a lack of authority are bigger problems than debts themselves.* While being a successful investment manager is hard, it's not nearly as hard as being a successful economic policy maker. We investors only have to understand how the economic machine works and anticipate what will happen next. Policy makers have to do that, plus make everything turn out well—i.e., they have to know what should be done while navigating through all the political impediments that make it so hard to get it done. To do that requires a lot of smarts, a willingness to fight, and political savvy—i.e., skills and heroism—and sometimes even with all those things, the constraints under which they work still prevent them from being successful.

Below I'll walk through each of the four levers and how they are typically used in the depression phase.

Austerity

In the depression phase, policy makers typically try austerity because that's the obvious thing to do. It's natural to want to let those who got themselves and others in trouble to bear the costs. The problem is that even deep austerity doesn't bring debt and income back into balance. When spending is cut, incomes are also cut, so it takes an awful lot of painful spending cuts to make significant reductions in the debt/income ratios.

As the economy contracts, government revenues typically fall. At the same time, demands on the government increase. As a result, deficits typically increase. Seeking to be fiscally responsible, at this point governments tend to raise taxes.

Both moves are big mistakes.

"Printing Money" to Stop the Bleeding and Stimulate the Economy

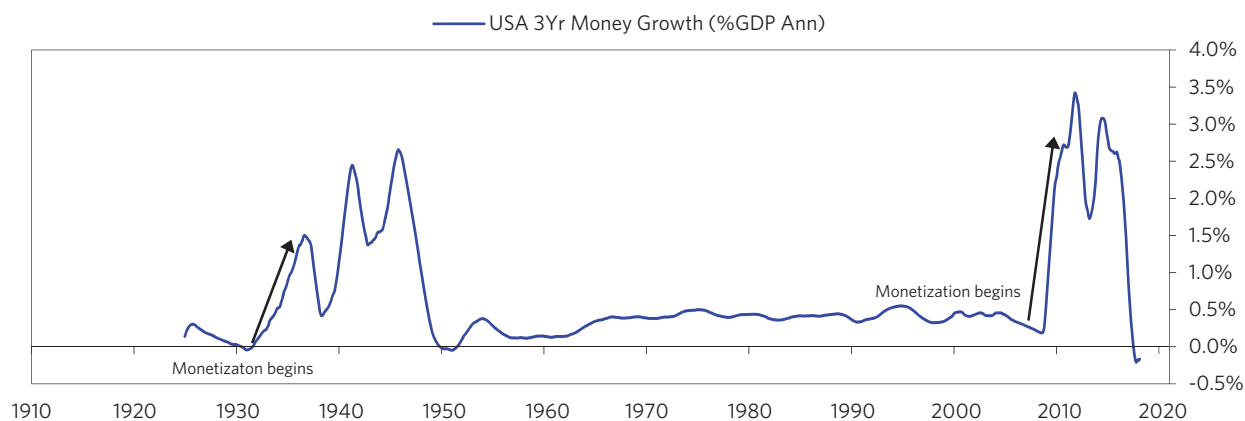
Quite often "runs" on lending institutions occur, especially those that aren't protected by government guarantees. That puts the central bank and the central government in the position of having to decide which depositors/lenders should be protected from losses and which should be allowed to sustain them, and which institutions are systemically important and should be saved—and how to do these things in a way that maximizes the safety of the

⁸ I don't mean to convey that debt reductions and austerity don't play beneficial roles in the deleveraging process because they do—but unless they are balanced with reflationary money printing, monetization, and guarantees, they cause a huge amount of pain while not doing enough to restore the economy.

financial/economic system while minimizing costs to the government/taxpayers. At such times all sorts of guarantees are offered to systemically critical financial institutions—and quite often some of these institutions are nationalized. Typically there are a lot of laws and politics that affect how quickly and how well this is done. Some of the money that is needed comes from the government (i.e., it is appropriated through the budget process) and some from the central banks (by “printing”). Governments inevitably do both, though in varying degrees. In addition to providing money to some essential banks, governments also typically provide money to some nonbank entities they consider essential.

Next, they must ease the credit crunch and stimulate the overall economy. Since the government is likely having trouble raising funds through taxation and borrowing, central banks are forced to choose between “printing” still more money to buy their governments’ debts or allowing their governments and their private sector to compete for the limited supply of money, which will only tighten money further. Inevitably, they choose to print.

Typically, though not necessarily, these moves come in progressively larger doses as more modest initial attempts fail to rectify the imbalance and reverse the deleveraging process. However, those early efforts do typically cause temporary periods of relief that are manifest in bear-market rallies in financial assets and increased economic activity. During the Great Depression there were six big rallies in the stock market (of between 16 percent and 48 percent) in a bear market that declined a total of 89 percent. All of those rallies were triggered by government actions that were intended to reduce the fundamental imbalance. When they are managed well, those shifts in policies to “print money,” buy assets, and provide guarantees are what moves the debt cycle from its depression/“ugly deleveraging” phase to its expansion/“beautiful deleveraging” phase. The chart below shows how this “money printing” happened in the US in the 1930s and again after 2008.



While highly stimulative monetary policy is a critical part of a deleveraging, it is typically not sufficient. When risks emerge that systemically important institutions will fail, policy makers must take steps to keep these entities running. They must act immediately to:

- **Curtail panic and guarantee liabilities.** Governments can increase guarantees on deposits and debt issuance. Central banks can provide systemically important institutions (i.e., institutions whose failures would threaten the ongoing operating of the financial system and/or that of the economy) with injections of money. Occasionally, governments can force liquidity to remain in the banking system by imposing deposit freezes, which is generally undesirable because it intensifies the panic, but is sometimes necessary because there is no other way of providing that money/liquidity.
- **Provide liquidity.** When private credit is contracting and liquidity is tight, the central bank can ensure that sufficient liquidity is provided to the financial system by lending against a widening range of collateral or to an increasingly wide range of financial institutions that are not normally considered part of their lending practices.

- **Support the solvency of systemically important institutions.** The first step is usually to incentivize the private sector to address the problem, often by supporting mergers between failed banks and healthy banks and by regulatory pushes to issue more capital to the private sector. In addition, accounting adjustments can be made to reduce the immediate need for capital to maintain solvency, buying more time for the institutions to earn their way out of their problems.
- **Recapitalize/nationalize/cover losses of systemically important financial institutions.** When the above approaches are insufficient to deal with the solvency problems of systemically important financial institutions, governments must step in to recapitalize failed banks. Moving to stabilize lenders and maintain the credit supply is critical to preventing a crisis from getting worse. Certain institutions are part of the plumbing of the system; one would hate to lose them even if they're not making money at the moment. It would be like losing a shipping port in a depression because the port goes broke. You want the port to continue to operate and ships to come in, so you have to protect it one way or another—whether through a nationalization, loans, or capital injections.

Debt Defaults/Restructurings

Ultimately, the process of cleansing existing bad debts is critical for the future flow of money and credit and for a return to prosperity. The challenge for policy makers is to allow that process to work itself out in an orderly way that ensures economic and social stability. The best-managed cases are those in which policy makers a) swiftly recognize the magnitude of the credit problems; b) don't save every institution that is expendable, balancing the benefits of allowing broke institutions to fail and be restructured with the risks that such failures can have detrimental effects on other creditworthy lenders and borrowers; c) create or restore robust credit pipes that allow for future borrowing by creditworthy borrowers; and d) ensure acceptable growth and inflation conditions while the bad debts are being worked out. Longer term, the most important decision that policy makers have to make is whether they will change the system to fix the root causes of the debt problems or simply restructure the debts so that the pain is distributed over the population and over time so that the debt does not impose an intolerable burden.

These things rarely happen right away. Policy makers typically fail to recognize the magnitude of the problem initially, instead enacting a number of one-off policies that are insufficient to move the needle. It is only after what is usually a couple of years and a lot of unnecessary economic pain that they finally act decisively. How quickly and aggressively policy makers respond is among the most important factors in determining the severity and length of the depression. And the question of exactly how these costs are divided between the government (which means the society as a whole) and the bond holders (of varying seniorities), equity holders, depositors, etc., is an important one.

Typically, nonsystemically important institutions are forced to absorb their losses, and if they fail, are allowed to go bankrupt. The resolution of these institutions can take several different forms. In many cases (about 80 percent of the cases we studied), they are merged with healthy institutions. In some other cases, the assets are liquidated or transferred to an "asset-management company" (AMC) set up by the government to be sold piecemeal.

In some cases, policy makers recognize that ensuring the viability of the whole banking system is critical and liquidity and solvency measures are taken at the banking system level. In recent years it has become common for guarantees of bank liabilities to be issued in countries in the developed world. In rare cases, government-financed bank recapitalization is done across all banks, rather than focused solely on systemically important institutions.

There are relatively clear lines for which creditors receive protections:

- **Small depositors are given preference and experience minimal or no losses (in nearly every case).** Often this is explicitly defined as part of a deposit insurance scheme. Coverage is usually expanded during the crisis period in order to ensure liquidity for the banks. Even in cases where there isn't an explicit deposit insurance scheme, depositors are often prioritized. In around 30 percent of cases studied, depositors did take losses, though they were often on foreign-exchange deposits through conversion at below-market exchange rates.
- **In most cases when institutions fail, equity, subordinated debt, and large depositors absorb losses regardless of whether the institution was systemically important or not.** Protection of senior and

subordinated debt holders, and equity recapitalizations that are simply dilutive to existing equity holders, are seen mostly in the developed world.

- **Sometimes policy makers prioritize domestic creditors over foreign creditors, especially when their loans are to private-sector players and are lower down in the capital structure.** This is especially true as deposit insurance programs run low on funds. But at the same time governments often end up prioritizing the payment of loans from multinational institutions like the IMF and BIS, as it's important to maintain availability of support from these public entities, who effectively act as lenders of last resort to countries under stress.

Typically, the process of dealing with the failed lenders is accompanied by a spate of regulatory reforms. Sometimes these changes are modest and sometimes they are very large; sometimes they are for the better and sometimes they are for the worse. They range from changes in how banks operate (e.g., putting in deposit guarantees in the 1930s or Dodd-Frank and the Volcker rule in 2010 in the US) to labor market reforms, from requiring banks to improve credit standards to opening the banking system to competition (including foreign entrants) to raising capital requirements and removing protections to lenders.

Politics plays a big role in determining what reforms are made. In some cases, such reforms end up distorting private-sector market-based incentives on the flow of lending, which can limit the flow of credit to creditworthy borrowers and/or increase the risks of future credit problems emerging. In other cases, they improve the flow of credit, protect households, and reduce the risk of debt problems in the future.

There are two main ways in which failed lenders' assets or existing lenders' bad assets are managed: They are either a) transferred to a separate entity (an AMC) to manage the restructuring and asset disposal (about 40 percent of the cases studied) or b) they remain on the balance sheet of the original lending institution to manage (about 60 percent of cases). And there are several main levers for disposing of the nonperforming loans: a) restructuring (e.g., working out the loans through extended terms), b) debt-for-equity swaps and asset seizures, c) direct sales of the loans or assets to third parties, and d) securitizations.

The use of an AMC generally accelerates the management of the debt problem because it frees up existing banks to return to lending and helps consolidate the bad debts to a centralized entity that can manage sales and restructurings. Selling assets to AMCs also often serves as a mechanism to engage in transfers to banks by pricing them at above market prices. AMCs are typically publicly owned entities that are mandated to sell the assets within some targeted time frame (e.g., 10 years) while minimizing costs to the taxpayer and disruptions of asset markets. They do this by seeking to quickly sell off the performing assets of failed institutions and working over time to manage and sell off nonperforming assets. In some cases AMCs have explicit goals to restructure the nonperforming debts to reduce debt burdens. They are generally financed by some form of direct or pseudo-government debt issuance, and they cannot work well when legal, political, or funding constraints limit their ability to recognize bad debts and restructure them.

Allowing the original lender to manage its bad debts often occurs when the original lender is state-sponsored, which makes it closer to a public AMC. In other cases losses may be allowed to sit on the lender's balance sheet if they are not too large, if the technical expertise to create a centralized AMC doesn't exist, or if effective resolution mechanisms already exist.

Much as with lenders, there is usually a relatively clear distinction between how systemically or strategically important borrowers are handled and how those that aren't are.

- For systemically important borrowers or strategically important ones, policy makers generally take steps to ensure that the businesses remain intact as entities. In general this occurs through a restructuring of the debts to make the ongoing debt service manageable. This can occur through debt-for-equity swaps, through reducing the existing debts, lowering interest rates, or terming out the borrowing. Occasionally policy makers also introduce new lending programs to these borrowers to ensure their ongoing liquidity. This process is often explicitly one of the goals of AMCs set up to manage bad debts.

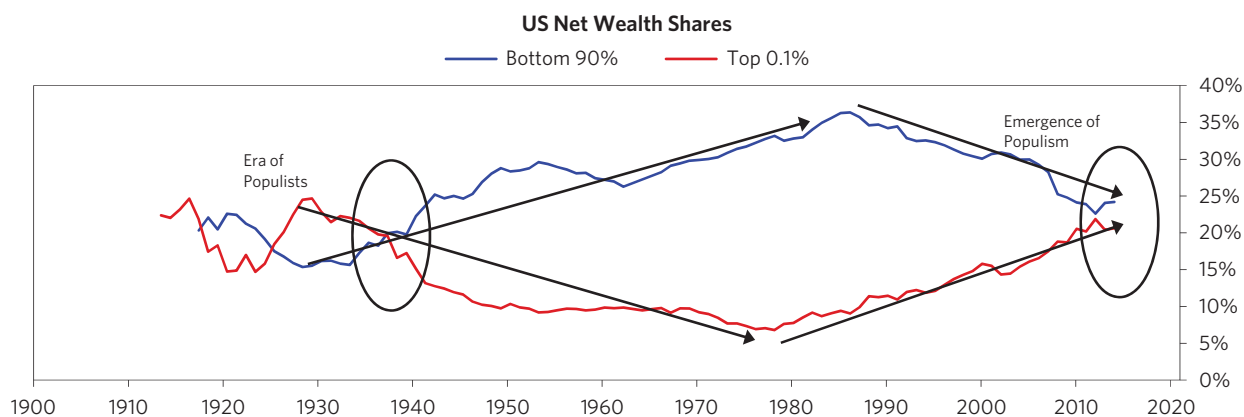
- Nonsystemically important borrowers are usually left to restructure their loans with private lenders or are allowed to go bankrupt and are liquidated.
- Central governments often take steps to help reduce the debt burdens on the household sector. AMC's may also take steps to restructure debt burdens rather than foreclosing on the loans as part of their goal of maximizing recovery values.

The table below shows how frequently the previously described policy moves were deployed in our study of the 48 historical cases detailed in Part 3.

Frequency of Levers Used to Manage Debt Problems (% of Cases)		
Liquidity Support	Emergency Lending/Liquidity	88%
	Bank Liability Guarantee	58%
	Bank Holiday/Deposit Freeze	21%
Address Insolvent Lenders	Bank Restructuring/Mergers	81%
	Recapitalization	73%
	Nationalizations	60%
	Losses Imposed on Depositors	29%
Dispose of Bad Debts	Through Asset Purchases and Transfers	44%
	Through Centralized Asset Management Co's	38%
Sovereign Default/Restructuring		35%
IMF Program		52%

Redistributing Wealth

Wealth gaps increase during bubbles and they become particularly galling for the less privileged during hard times. As a general rule, if rich people share a budget with poor people and there is an economic downturn, there will be economic and political conflict. It is during such times that populism on both the left and the right tends to emerge. How well the people and the political system handle this is key to how well the economy and the society weather the period. As shown below, both inequality and populism are on the rise in the US today, much as they were in the 1930s. In both cases, the net worth of the top 0.1 percent of the population equaled approximately that of the bottom 90 percent combined.



In some cases, raising taxes on the rich becomes politically attractive because the rich made a lot of money in the boom—especially those working in the financial sector—and are perceived to have caused the problems because of their greed. The central bank's purchases of financial assets also disproportionately benefit the rich, because the rich own many more such assets. Big political shifts to the left typically hasten redistributive efforts. This typically drives the rich to try to move their money in ways and to places that provide protection, which itself has effects on asset and currency markets. It can also cause an economic "hollowing out" of those areas because the big income earners, who are also the big income taxpayers, leave, reducing overall tax revenues and leading these areas to suffer sharp declines in property values and reductions in services.

Typically, increased taxation takes the form of greater income, property, and consumption taxes because these forms of taxation are the most effective at raising revenues. Wealth and inheritance taxes are sometimes also increased,⁹ though these typically raise very little money because so much wealth is illiquid that it is practically difficult to collect on, and forcing the taxpayer to sell liquid assets to make their tax payments undermines capital formation. Regardless, transfers rarely occur in amounts that contribute meaningfully to the deleveraging (unless there are “revolutions” and huge amounts of property are nationalized).

5) The “Beautiful Deleveraging”

A “beautiful deleveraging” happens when the four levers are moved in a balanced way so as to reduce intolerable shocks and produce positive growth with falling debt burdens and acceptable inflation. More specifically, deleveraging becomes beautiful when there is enough stimulation (i.e., through “printing of money”/debt monetization and currency devaluation) to offset the deflationary deleveraging forces (austerity/defaults) and bring the nominal growth rate above the nominal interest rate—but not so much stimulation that inflation is accelerated, the currency is devaluated, and a new debt bubble arises.

The best way of negating the deflationary depression is for the central bank to provide adequate liquidity and credit support, and, depending on different key entities’ needs for capital, for the central government to provide that too. Recall that spending comes in the form of either money or credit. When increased spending cannot be financed with increased debt because there is too much debt relative to the amount of money there is to service the debt, increased spending and debt-service relief must come from increased money. This means that the central bank has to increase the amount of money in the system.

The central bank can do this by lending against a wider range of collateral (both of lower quality and longer maturity) and also by buying (monetizing) lower-quality and/or longer-term debt. This produces relief and, if it’s done in the right amounts, allows a deleveraging to occur with positive growth. The right amounts are those that a) neutralize what would otherwise be a deflationary credit market collapse and b) get the nominal growth rate marginally above the nominal interest rate to tolerably spread out the deleveraging process.

So, what do I mean by that? Basically, income needs to grow faster than debt. For example: Let’s assume that a country going through a deleveraging has a debt-to-income ratio of 100 percent. That means that the amount of debt it has is the same as the amount of income the entire country makes in a year. Now think about the interest rate on that debt. Let’s say it’s 2 percent. If debt is 100 and the interest rate is 2 percent, then if no debt is repaid it will be 102 after one year. If income is 100 and it grows at 1 percent, then income will be 101, so the debt burden will increase from 100/100 to 102/101. So for the burdens from existing debt not to increase, nominal income growth must be higher than nominal interest rates, and the higher the better (provided it is not so high that it produces unacceptable inflation and/or unacceptable currency declines).

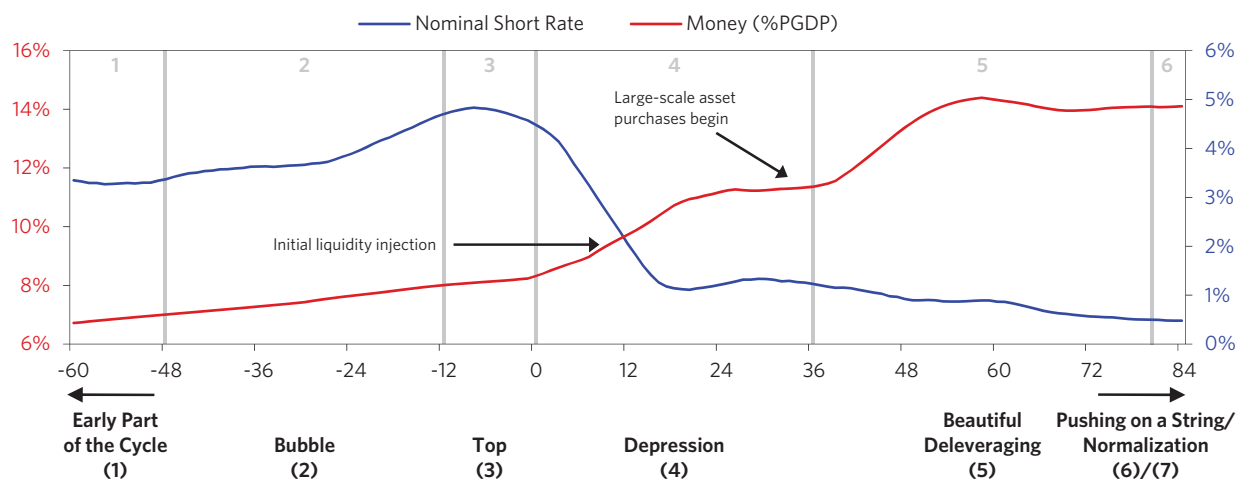
People ask if printing money will raise inflation. It won’t if it offsets falling credit and the deflationary forces are balanced with this reflationary force. That’s not a theory—it’s been repeatedly proven out in history. Remember, spending is what matters. A dollar of spending paid for with money has the same effect on prices as a dollar of spending paid for with credit. By “printing money,” the central bank can make up for the disappearance of credit with an increase in the amount of money. This “printing” takes the form of central bank purchases of government securities and nongovernment assets such as corporate securities, equities, and other assets, which is reflected in money growing at an extremely fast rate at the same time as credit and real economic activity are contracting. Traditional economists see that as the velocity of money declining, but it’s nothing of the sort. What is happening at such times is that credit destruction is being offset by money creation. If the balance between replacing credit and actively stimulating the economy is right, this isn’t inflationary.

But there is such a thing as abusive use of stimulants. Because stimulants work so well relative to the alternatives, there is a real risk that they can be abused, causing an “ugly inflationary deleveraging” (like the Weimar

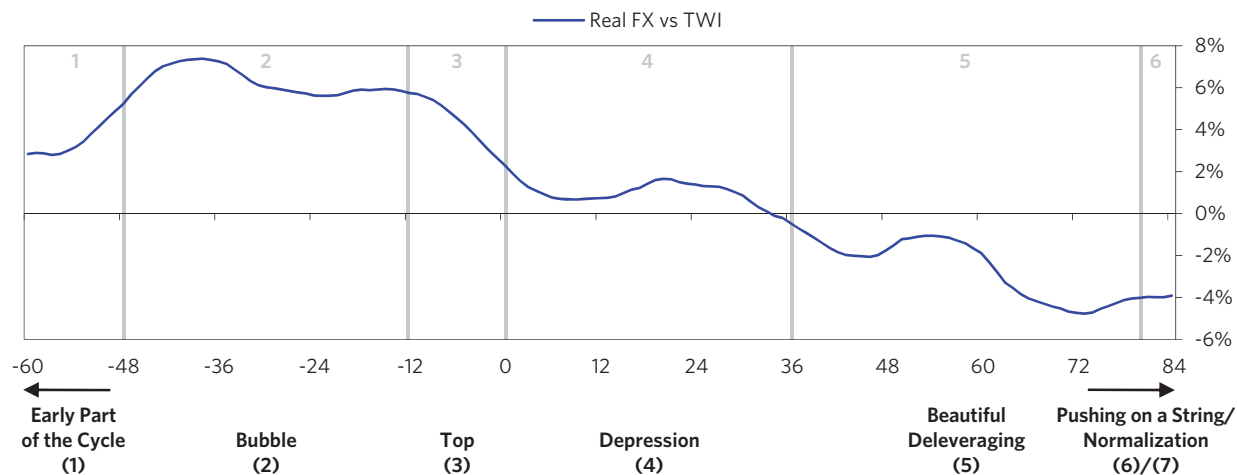
⁹ The extent to which wealth taxes can be applied varies by country. For example, they have been judged to be unconstitutional in the US but have been allowed in other countries.

hyperinflation of the 1920s, or those in Argentina and Brazil in the 1980s). The key is to avoid printing too much money. If policy makers achieve the right balance, a deleveraging isn't so dramatic. Getting this balance right is much more difficult in countries that have a large percentage of debt denominated in foreign currency and owned by foreign investors (as in Weimar Germany and the South American countries) because that debt can't be monetized or restructured as easily.

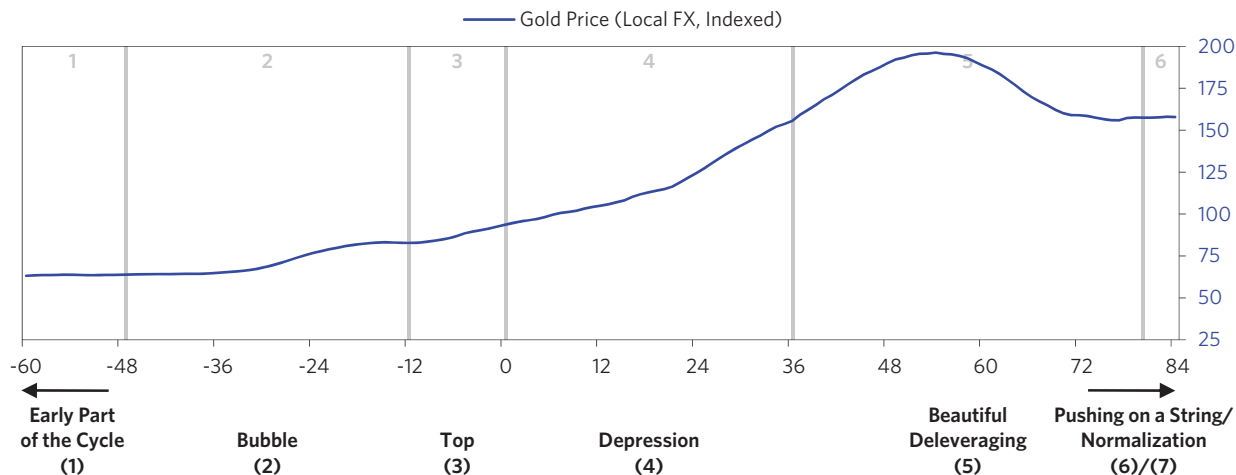
Printing money/debt monetization and government guarantees are inevitable in depressions in which interest rate cuts won't work, though these tools are of little value in countries that are constrained from printing or don't have assets to back printing up and can't easily negotiate the redistributions of the debt burdens. All of the deleveragings that we have studied (which is most of those that occurred over the past hundred years) eventually led to big waves of money creation, fiscal deficits, and currency devaluations (against gold, commodities, and stocks). In different cases, policy makers have varied which exact combination of the levers they used, typically as a function of the nature of their monetary systems. The chart below conveys the archetypal path of money printing in deflationary deleveragings over the 21 cases. The money printing occurs in two classic waves—central banks first provide liquidity to stressed institutions, and then they conduct large-scale asset purchases to broadly stimulate the economy.



Below we show the average real exchange rate versus trade partners, which reflects the strength/weakness of a currency relative to the country's trade partners.



Typically, governments with gold-, commodity-, or foreign-currency-pegged money systems are forced to have tighter monetary policies to protect the value of their currency than governments with fiat monetary systems. But eventually the debt contractions become so painful that they relent, break the link, and print (i.e., either they abandon these systems or change the amount/pricing of the commodity that they will exchange for a unit of money). For example, when the value of the dollar (and therefore the amount of money) was tied to gold during the Great Depression, suspending the promise to convert dollars into gold so that the currency could be devalued and more money created was key to creating the bottoms in the stock and commodity markets and the economy. Printing money, making asset purchases, and providing guarantees were much easier to do in the 2008 financial crisis, as they didn't require a legalized and official change in the currency regime. The chart below shows the archetypal path of gold prices. In the US Great Depression, gold rose overnight when Roosevelt broke the gold peg, and during the more recent financial crisis, Fed moves helped push down the value of the dollar versus all currencies, including gold.



In the end, policy makers always print. That is because austerity causes more pain than benefit, big restructurings wipe out too much wealth too fast, and transfers of wealth from haves to have-nots don't happen in sufficient size without revolutions. Also, printing money is not inflationary if the size and character of the money creation offsets the size and character of the credit contraction. It is simply negating deflation. In virtually all past deleveragings, policy makers had to discover this for themselves after they first tried other paths without satisfactory results. History has shown that those who did it quickly and well (like the US in 2008–09) have derived much better results than those who did it late (like the US in 1930–33).

The table below summarizes the typical amount of printing and currency devaluation required to create the turn from a depression to a “beautiful deleveraging.” On average the printing of money has been around 4 percent of GDP per year. There is a large initial currency devaluation of around 50 percent against gold, and deficits widen to about 6 percent of GDP. On average, this aggressive stimulation comes two to three years into the depression, after stocks have fallen more than 50 percent, economic activity has fallen about 10 percent, and unemployment has risen to around 10 to 15 percent, though there is a lot of variation.

I'm providing these numbers only as broad indicators, since circumstances vary considerably. When looking at the differences (which are very interesting but beyond the scope of this study), it is clear that when monetary and fiscal policies are rolled out faster and smarter, the results are much better than these averages.

Policy Responses

	Avg	Range
1 Length of contraction (months)	55	22 to 79
2 Size of FX decline vs. Gold	-44%	-58% to -37%
3 Peak Money Creation (%GDP, ann)	4%	1% to 9%
4 Peak Fiscal Deficit	-6%	-14% to -1%

To reiterate, the key to having a beautiful deleveraging lies in balancing the inflationary forces against the deflationary ones. That’s because too much money printing can also produce an ugly inflationary deleveraging (which we will go through later). The right amounts of stimulus are those that a) neutralize what would otherwise be a deflationary credit-market collapse and b) get the nominal growth rate above the nominal interest rate by enough to relieve the debt burdens, but not by so much that it leads to a run on debt assets.

In summary, when all is said and done, only a few things distinguish whether a deleveraging is managed well or poorly. I have outlined them below. A lot of pain can be avoided if policy makers can learn from the common pitfalls and understand the policies characteristic of beautiful deleveragings.

	Well Managed	Poorly Managed
Bubble	<ul style="list-style-type: none"> Central banks consider growth in debt and its effects on asset markets in managing policy. If they can prevent the bubble, they can prevent the bust. Central banks use macroprudential policies to target restraints in debt growth where bubbles are emerging and allow debt growth where it is not excessive. Fiscal policies are tightened. 	<ul style="list-style-type: none"> Big bubbles are fueled by speculators and lenders over-extrapolating past successes and making further debt-financed investments, and by central banks focusing just on inflation and/or growth and not considering debt bubbles in investment assets, thus keeping credit cheap for too long.
Top	<ul style="list-style-type: none"> Central banks constrict the bubble either with the control of broad monetary policy or with well-chosen macroprudential policies and then ease selectively (via macroprudential policies). 	<ul style="list-style-type: none"> Central banks continue to tighten well after bursting the bubble.
Depression	<ul style="list-style-type: none"> Central banks provide ample liquidity, ease short rates quickly until they hit 0%, and then pursue aggressive monetizations, using aggressive targeted macroprudential policies. Governments pursue aggressive and sustained fiscal stimulus, easing past the turn. Systemically important institutions are protected. 	<ul style="list-style-type: none"> Central banks are slower to cut rates, provide more limited liquidity, and tighten too early. They also wait too long to pursue aggressive monetization. Governments pursue austerity without adequately easing. Systemically important institutions are left damaged or failed.
Beautiful Deleveraging	<ul style="list-style-type: none"> Reflations begin with aggressive monetizations through asset purchases or big currency declines, enough to bring nominal growth above nominal rates. Stimulative macroprudential policies are targeted to protect systemically important entities and to stimulate high-quality credit growth. Nonsystemically important institutions are allowed to fail in an orderly way. Policy makers balance the depressive forces of defaults and austerity with the reflationary forces of debt monetization, currency declines, and fiscal stimulus. 	<ul style="list-style-type: none"> Initial monetizations stutter and start. Asset purchases are more muted and consist more of cash-like instruments rather than risky assets, so that purchases don't produce a wealth effect. Stimulation of the central bank is undermined by fiscal austerity. Overindebted entities are protected even though they are not systemically important, leading to zombie banks and malaise. Ugly inflationary depressions arise in cases where policy makers allow faith in the currency to collapse and print too much money.

6) “Pushing on a String”

Late in the long-term debt cycle, central bankers sometimes struggle to convert their stimulative policies into increased spending because the effects of lowering interest rates and central banks’ purchases of debt assets have diminished. At such times the economy enters a period of low growth and low returns on assets, and central bankers have to move to other forms of monetary stimulation in which money and credit go more directly to support spenders. When policy makers faced these conditions in the 1930s, they coined the phrase “pushing on a string.” One of the biggest risks at this stage is that if there is too much printing of money/monetization and too severe a currency devaluation relative to the amounts of the deflationary alternatives, an “ugly inflationary deleveraging” can occur.

To help understand the different kinds of monetary policies that can be used throughout a deleveraging, I think of them as coming in three different styles, each with its own effects on the economy and markets.

Monetary Policy 1

Interest-rate driven monetary policy (which I'll call Monetary Policy 1) is the most effective because it has the broadest impact on the economy. When central banks reduce interest rates, they stimulate the economy by a) producing a positive wealth effect (because the lower interest rate raises the present value of most investments); b) making it easier to buy items on credit (because the monthly payments decline), raising demand—especially for interest-rate-sensitive items like durable goods and housing; and c) reducing debt-service burdens (which improves cash flows and spending). MP1 is typically the first approach to a debt crisis, but when short-term interest rates hit around 0 percent, it no longer works effectively, so central banks must go to the second type.

Monetary Policy 2

“Quantitative easing” (QE) as it is now called (i.e., “printing money” and buying financial assets, typically debt assets), is Monetary Policy 2. It works by affecting the behavior of investors/savers as opposed to borrowers/spenders, because it is driven by purchases of financial assets, typically debt assets that impact investors/savers the most. When the central bank buys a bond, it gives investors/savers cash, which they typically use to buy another financial asset that they think is more attractive. What they do with that money and credit makes all the difference in the world. When they invest in the sort of assets that finance spending, that stimulates the economy. When they invest in those that don't (such as financial assets), there must be very large market gains before any money trickles down into spending—and that spending comes more from those who have enjoyed the market gains than from those who haven't. In other words, QE certainly benefits investors/savers (i.e., those who own financial assets) much more than people who don't, thus widening the wealth gap.

While MP2 is generally less effective than interest-rate changes, it is most effective when risk and liquidity premiums are large, because it causes those premiums to fall. When risk premiums are large, and money is added to the system, actual risks are reduced at the same time that there is more money seeking returns, which triggers purchases of riskier assets that are offering higher expected returns, driving their prices up and producing a positive wealth effect.

But over time, the use of QE to stimulate the economy declines in effectiveness because risk premiums are pushed down and asset prices are pushed up to levels beyond which they are difficult to push further, and the wealth effect diminishes. **In other words, at higher prices and lower expected returns, the compensation for taking risk becomes too small to get investors to bid prices up, which would drive prospective returns down further.** In fact, the reward-to-risk ratio could make those who are long a lot of assets view that terribly returning asset called cash as more appealing. As a result, QE becomes less and less effective. If they provide QE and private credit growth doesn't pick up, policy makers feel like they are pushing on a string.

At this stage, policy makers sometimes monetize debt in even larger quantities in an attempt to compensate for its declining effectiveness. While this can help for a bit, there is a real risk that prolonged monetization will lead people to question the currency's suitability as a store hold of value. This can lead them to start moving to alternative currencies, such as gold. The fundamental economic challenge most economies have in this phase is that the claims on purchasing power are greater than the abilities to meet them.

Think of it this way: There are only goods and services. Financial assets are claims on them. In other words, holders of investments/assets (i.e., capitalists/investors) believe that they can convert their holdings into purchasing power to get goods and services. At the same time, workers expect to be able to exchange a unit's worth of their contribution to the production of goods and services into buying power for goods and services. But since debt/money/currency have no intrinsic value, the claims on them are greater than the value of what they are supposed to be able to buy, so they have to be devalued or restructured. In other words, when there are too many debt liabilities/assets, they either have to be reduced via debt restructurings or monetized. Policy makers tend to use monetization at this stage primarily because it is stimulative rather than contractionary. But monetization simply swaps one IOU (debt) for another (newly printed money). The situation is analogous to a Ponzi scheme. Since there aren't enough goods and services likely to be produced to back up all the IOUs, there's a worry that people may not be willing to work in return for IOUs forever.

Low interest rates together with low premiums on risky assets pose a structural challenge for monetary policy. With Monetary Policy 1 (interest rates) and Monetary Policy 2 (QE) at their limits, the central bank has very little ability to provide stimulus through these two channels—i.e., monetary policy has little “gas in the tank.” This typically happens in the later years of the long-term debt cycle (e.g., 1937-38 and now in the US), which can lead to “pushing on a string.” When this happens, policy makers need to look beyond QE to the new forms of monetary and fiscal policy characterized by Monetary Policy 3.

Monetary Policy 3

Monetary Policy 3 puts money more directly into the hands of spenders instead of investors/savers and incentivizes them to spend it. Because wealthy people have fewer incentives to spend the incremental money and credit they get than less wealthy people, when the wealth gap is large and the economy is weak, directing spending opportunities at less wealthy people is more productive.

Logic and history show us that there is a continuum of actions to stimulate spending that have varying degrees of control to them. At one end are coordinated fiscal and monetary actions, in which fiscal policy makers provide stimulus directly through government spending or indirectly by providing incentives for nongovernment entities to spend. At the other end, the central bank can provide “helicopter money” by sending cash directly to citizens without coordination with fiscal policy makers. Typically, though not always, there is a coordination of monetary policy and fiscal policy in a way that creates incentives for people to spend on goods and services. Central banks can also exert influence through macroprudential policies that help to shape things in ways that are similar to how fiscal policies might. For simplicity, I have organized that continuum and provided references to specific prior cases of each below.

- **An increase in debt-financed fiscal spending.** Sometimes this is paired with QE that buys most of the new issuance (e.g., in Japan in the 1930s, US during World War II, US and UK in the 2000s).
- **Increase in debt-financed fiscal spending, where the Treasury isn’t on the hook for the debt,** because:
 - The central bank can print money to cover debt payments (e.g., Germany in the 1930s).
 - The central bank can lend to entities other than the government that will use it for stimulus projects (e.g., lending to development banks in China in 2008).
- **Not bothering to go through issuing debt, and instead giving newly printed money directly to the government to spend.** Past cases have included printing fiat currency (e.g., in Imperial China, the American Revolution, the US Civil War, Germany in the 1930s, and the UK during World War I) or debasing hard currency (Ancient Rome, Imperial China, 16th-century England).
- **Printing money and doing direct cash transfers to households (i.e., “helicopter money”).** When we refer to “helicopter money,” we mean directing money into the hands of spenders (e.g., US veterans’ bonuses during the Great Depression, Imperial China).

How that money is directed could take different forms—the basic variants are either to direct the same amount to everyone or aim for some degree of helping one or more groups over others (e.g., giving money to the poor rather than to the rich). The money can be provided as a one-off or over time (perhaps as a universal basic income). All of these variants can be paired with an incentive to spend it—such as the money disappearing if it’s not spent within a year. The money could also be directed to specific investment accounts (like retirement, education, or accounts earmarked for small-business investments) targeted toward socially desirable spending/investment. Another potential way to craft the policy is to distribute returns/holdings from QE to households instead of to the government.

- **Big debt write-down accompanied by big money creation** (the “year of Jubilee”) as occurred in Ancient Rome, the Great Depression, and Iceland.

While I won't offer opinions on each of these, I will say that the most effective approaches involve fiscal/monetary coordination, because that ensures that both the providing and the spending of money will occur. If central banks just give people money (helicopter money), that's typically less adequate than giving them that money with incentives to spend it. However, sometimes it is difficult for those who set monetary policy to coordinate with those who set fiscal policy, in which case other approaches are used.

Also, keep in mind that sometimes the policies don't fall exactly into these categories, as they have elements of more than one of them. For example, if the government gives a tax break, that's probably not helicopter money, but it depends on how it's financed. The government can also spend money directly without a loan financed by the central bank—that is helicopter money through fiscal channels.

While central banks influence the costs and availabilities of credit for the economy as whole, they also have powers to influence the costs and availabilities of credit for targeted parts of the financial system through their regulatory authorities. These policies, which are called macroprudential policies, are especially important when it's desirable to differentiate entities—e.g., when it is desirable to restrict credit to an overly indebted area while simultaneously stimulating the rest of the economy, or when it's desirable to provide credit to some targeted entities but not provide it broadly. Macroprudential policies take numerous forms that are valuable in different ways in all seven stages of the big debt cycle. Because explaining them here would require too much of a digression, they are explained in some depth in the Appendix.

7) Normalization

Eventually the system gets back to normal, though the recovery in economic activity and capital formation tends to be slow, even during a beautiful deleveraging. It typically takes roughly 5 to 10 years (hence the term “lost decade”) for real economic activity to reach its former peak level. And it typically takes longer, around a decade, for stock prices to reach former highs, because it takes a very long time for investors to become comfortable taking the risk of holding equities again (i.e., equity risk premiums are high).

Recovery Conditions

	Avg	Range
1 Length of equity drawdown (months)	119	60 to 249
2 Length of GDP drawdown (months)	72	25 to 106
3 Change in debt-to-GDP post-stimulation	-54%	-70% to -29%

Now that you have this template for deflationary depressions in mind, I encourage you to read the detailed accounts of the US 2007–2011 and 1928–1937 big debt cycles shown in Part 2 and then look at the summary statistics and auto-text of the 21 case studies shown in Part 3.

Inflationary Depressions and Currency Crises

In the previous section, we looked at the archetypal deflationary debt crisis, which we created by averaging the 21 deflationary cycles you can review in Part 3. We will now look at the archetypal inflationary debt crisis, which we created by averaging the 27 worst cases of inflationary cycles (also shown in Part 3). After reviewing this template, I encourage you to read about the hyperinflation in Germany's Weimar Republic, which is examined in depth in Part 2, to compare it to the archetypal case described here. Before we turn to the charts and other data, please remember that:

- Currency and debt serve two purposes: to be 1) mediums of exchange and 2) store holds of wealth
- Debt is one person's asset and another's liability
- Debt is a promise to pay in a certain type of currency (e.g., dollars, euro, yen, pesos, etc.)
- Holders of debt assets expect to convert them into money and then into goods and services down the road, so they are very conscious of the rate of its loss of purchasing power (i.e., inflation) relative to the compensation (i.e., the interest rate) they get for holding it
- Central banks can only produce the type of money and credit that they control (e.g., the Fed makes dollar denominated money and credit, the BoJ makes Japanese yen money and credit, etc.)
- Through a symbiotic relationship, over time central banks and free-market borrowers and lenders typically create bigger and bigger piles of debt assets and debt liabilities
- The bigger the pile, the greater the challenge for central bankers to balance the opposing pressures so the pile doesn't topple over into a deflationary depression in one direction or an inflationary depression in the other
- Policy makers (those who control monetary and fiscal policies) can usually balance these opposing forces in debt crises because they have a lot of power to redistribute the burdens so they are spread out, though they can't always balance them well
- Central banks typically relieve debt crises by "printing" a lot of the currency in which the debt is denominated, which, while stimulating spending on investment assets and the economy, also cheapens the value of the currency (all else being equal)
- If a currency falls in relation to another currency at a rate that is greater than the currency's interest rate, the holder of the debt in the weakening currency will lose money. If investors expect that weakness to continue without being compensated with higher interest rates, a dangerous currency dynamic will develop.

That last dynamic, i.e., the currency dynamic, is what produces inflationary depressions. Holders of debt denominated in the poorly returning currency are motivated to sell it and move their assets into another currency or a non-currency store hold of wealth like gold. When there is a debt crisis and economic weakness in a country, it is typically impossible for the central bank to raise interest rates enough to compensate for the currency weakness, so the money leaves that country and currency for safer countries. When so much money leaves the country that lending dries up, the central bank is faced with the choice of letting the credit markets tighten or printing money, which produces a lot of it. While it is widely known that central banks manage the trade-offs between inflation and growth by changing interest rates and liquidity in the system, what is not widely known is that the central bank's trade-offs between inflation and growth are easier to manage when money is flowing into a country's currency/debt and more difficult to manage when it's flowing out. That's because if there is more demand for the currency/debt, that will push the currency/debt prices up, which, all else being equal, will push inflation down and growth up (assuming the central bank keeps the amount of money and credit steady); when there is less demand, the reverse will happen. How much changing demand there is for a country's currency/debt will create changes in the currency versus changes in interest rates will depend on how the central bank moves its levers—which I'll cover below. For now, suffice it to say that in times when money is flowing out of a currency, real interest rates need to rise less if real exchange rates fall more (and vice versa).

Capital outflows tend to happen when an environment is inhospitable (e.g., because debt, economic, and/or political problems exist), and they typically weaken the currency a lot. To make matters worse, those who fund their activities in the country that has the weaker currency by borrowing the stronger currency see their debt costs soar; that drives down the weaker currency relative to the stronger one even more. For these reasons, **countries with the worst debt problems, a lot of debt denominated in a foreign currency, and a high dependence on foreign capital typically have significant currency weaknesses. The currency weakness is what causes inflation when there is a depression.**

Normally this all runs its course when the currency and the debt prices go down enough to make them very cheap. More specifically, the squeeze ends when a) the debts are defaulted on and/or enough money is created to alleviate the squeeze, b) the debt service requirements are reduced in some other way (e.g., forbearance) and/or c) the currency depreciates much more than inflation picks up, so that the country's assets and the items it sells to the world become so competitively priced that its balance of payments improves. But a lot depends on politics. If the markets are allowed to run their courses, the adjustments eventually take place and the problems are resolved, but if the politics get so bad that productivity is thrown into a self-reinforcing downward spiral, that spiral can go on for a long time.

Which Countries/Currencies Are Most Vulnerable to Severe Inflationary Deleveragings or Hyperinflations?

While inflationary depressions are possible in all countries/currencies, they are far more likely in countries that:

- *Don't have a reserve currency* (so there is not a global bias to hold their currency/debt as a store hold of wealth)
- *Have low foreign-exchange reserves* (the cushion to protect against capital outflows is small)
- *Have a large foreign debt* (so there is a vulnerability to the cost of the debt rising via increases in either interest rates or the value of the currency the debtor has to deliver, or a shortage of the availability of dollar denominated credit)
- *Have a large and increasing budget and/or current account deficit* (causing the need to borrow or print money to fund the deficits)
- *Have negative real interest rates* (i.e., interest rates that are significantly less than inflation rates), therefore inadequately compensating lenders for holding the currency/debt
- *Have a history of high inflation and negative total returns in the currency* (increasing lack of trust in the value of the currency/debt)

Generally speaking, the greater the degree to which these things exist, the greater the degree of the inflationary depression. The most iconic case is the German Weimar Republic in the early 1920s, which is examined at length in Part 2. If you are interested in reviewing actual case studies showing the reasons why inflationary depressions happen rather than deflationary ones, it is worth noting the differences between the Weimar case study and the US Great Depression and 2007–2011 case studies, which are also examined in Part 2.

Can reserve-currency countries that don't have significant foreign-currency debt have inflationary depressions? While they are much less likely to have inflationary contractions that are as severe, they can have inflationary depressions, though they emerge more slowly and later in the deleveraging process, after a sustained and repeated overuse of stimulation to reverse deflationary deleveraging. Any country, including one with a reserve currency, can experience some movement out of its currency, which changes the severity of the trade-off between inflation and growth described earlier. If a reserve-currency country permits much higher inflation in order to keep growth stronger by printing lots of money, it can further undermine demand for its currency, erode its reserve currency status (e.g., make investors view it as less of a store hold of wealth), and turn its deleveraging into an inflationary one.

The Phases of the Classic Inflationary Debt Cycle

Classically, inflationary deleveragings follow the ebbs and flows of money and credit through five stages that mirror the stages of deflationary deleveragings, but that are different in important ways. Over the past few decades I have navigated through a number of inflationary deleveragings and researched many more. They transpire pretty much as deflationary deleveragings do up until the fourth stage, the depression.

I'll begin this section with a look at the stages of the archetypal inflationary deleveraging, just as I did in the prior section. (This archetype was created by averaging 27 inflationary deleveragings in which there was a lot of debt denominated in foreign currencies.) Then I'll compare the archetype to four specific hyperinflationary cases in order to highlight their differences.

1) The Early Part of the Cycle

In the healthy upswing, favorable capital flows are a result of good fundamentals—i.e., because the country is competitive and there is potential for productive investment. At this point, debt levels are low, and balance sheets are healthy. That stimulates export sales and hence foreign capital, which funds investments that produce good returns and yield productive growth.

Capital flows—both within countries and among them—are typically the most important flows to watch because they are the most volatile. As the cycle begins, debt and incomes rise at comparable rates and both debt and equity markets are strong, which encourages investing, often with borrowed money. The private sector, government, and banks start to borrow, which makes sense for them because incomes are rising quickly, making it easier to service the debt. These strong fundamentals and early leveraging up set the country up for a boom that in turn attracts more capital.

The positive, self-reinforcing cycle is enhanced when the demand for the currency is improving. If the currency is cheap enough to offer attractive opportunities to foreign investors (who will typically lend to or invest in entities that can produce inexpensively in that country and sell into export markets to earn the foreign currency to provide them with a good return), and/or the country sells more to foreigners than it buys from them, a country's balance of payments will become favorable—i.e., the demand for its currency will be greater than its supply. This makes the central bank's job easier—i.e., it can get more growth per unit of inflation—because the positive inflows can be used to appreciate the currency, to lower interest rates, and/or to increase reserves, depending on how the central bank chooses to handle it.

At these times of early currency strength, some central banks choose to enter the foreign-currency exchange market to sell their own currency for the incoming foreign currency in order to prevent it from rising (and to prevent the adverse economic effects of its rise). If the central bank does this, it needs to do something with that newly acquired currency, which is to buy investment assets denominated in that foreign currency (most typically bonds) and put them in an account called “foreign-exchange reserves.” Foreign-exchange reserves are like savings: They can be used to bridge imbalances between the amount of currency demanded and the amount supplied by the free market in order to cushion the movements of the currency markets. They can also be used to purchase assets that might be desirable investments or offer strategic returns. The process of accumulating reserves is stimulative to the economy because it lessens the upward pressure on their own currency, which allows a country to maintain stronger export competitiveness and puts more money in the economy. Since central banks need to create more money to buy the foreign currency, doing that increases the amount of domestic currency funds to either buy assets (causing asset prices to rise) or lend out.

At this juncture, the currency's total return will be attractive because either a) those who want to buy what the country has to offer need to sell their own currency and buy the local currency or b) the central bank will increase the supply of its own currency and sell it for the foreign currency, which will make the country's assets go up when measured in its own currency. So, during this time when a country has a favorable balance of payments, there is a net inflow of money that leads to the currency appreciating and/or the foreign-exchange

reserves increasing. This influx of money stimulates the economy and causes that country's markets to rise. Those invested in the country make money from the currency return (through a combination of currency price changes and asset return differences) and/or the asset appreciation. The more the currency appreciates, the less assets will appreciate.

2) The Bubble

The bubble emerges in the midst of a self-reinforcing virtuous cycle of strong capital flows, good asset returns, and strong economic conditions. The capital that came in during the early upswing produced good returns, as it was invested productively and led to asset price appreciation, which attracted even more capital. In the bubble phase, the prices of the currency and/or the assets get bid up and increasingly financed by debt, making the prices of these investments too high to produce adequate returns, but the borrowing and buying continues because prices are rising, and so debts rise rapidly relative to incomes.

When there is a big wave of money coming into (and/or staying in) a country/currency, typically the exchange rate is strong, foreign-exchange reserves increase, and the economy booms—or in some cases the currency rises a lot and the economy grows more slowly. This upswing tends to be self-reinforcing until it is so overdone that it reverses. It is self-reinforcing because the inflows drive up the currency, making it desirable to hold assets denominated in it (and desirable to hold liabilities denominated in other currencies), and/or produce more money creation that causes prices to rise more.

In either case, during these bubbles the total returns of these assets to foreigners (i.e., asset prices in local currency plus the currency appreciation) are very attractive. That plus that country's hot economic activity encourage more foreign inflows and fewer domestic outflows. Over time, the country becomes the hot place to invest, and its assets become overbought so debt and stock-market bubbles emerge. Investors believe the country's assets are a fabulous treasure to own and that anyone not in the country is missing out. Investors who were never involved with the market rush in. When the market gets fully long, leveraged, and overpriced, it becomes ripe for a reversal. In the bullets here and in the ones that follow, we show some key economic developments typically seen as the bubble inflates.

- Foreign capital flows are high (on average *around* 10 percent of GDP)
- The central bank is accumulating foreign-exchange reserves
- The real FX is bid up and becomes overvalued on a purchasing power parity (PPP) basis by around 15 percent
- Stocks rally (on average by over 20 percent for several years into their peak)

All sorts of entities build up structurally long currency positions because there is constant reward for doing that. Most participants are motivated to be long the currency of the country that is enjoying a sustained wave of investment into it—though they often find themselves in this position without explicitly taking it on or fully recognizing it. For example, foreign businesses that set up operations in the hot country might fund their activities with their own currency (to keep the liability in the currency that they expect will be weaker), but they might prefer to hold their deposits in the local currency, and they might not hedge the currency exposures that come from the revenues of sales in that country. Similarly, local businesses might borrow in the weaker foreign currency, which the foreign bankers are eager to lend because the market is hot. There are lots of different ways that a sustained bull market will lead to multinational entities getting long that local currency.

- The influx of foreign capital finances a boom in consumption
- Imports rise faster than exports, and the current account worsens

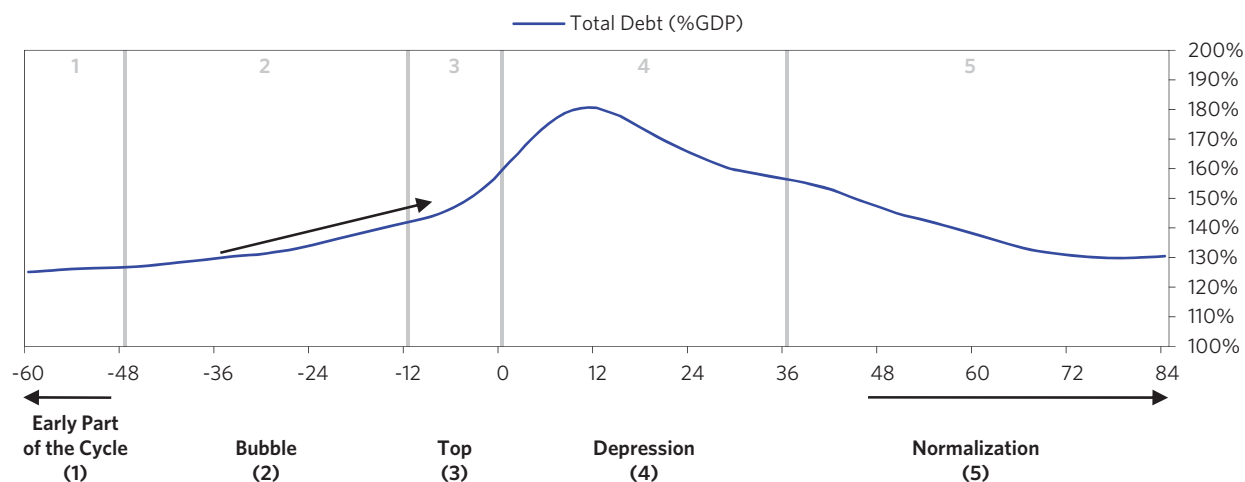
Meanwhile, investment in the country creates strong growth and rising incomes, which make borrowers in the country more creditworthy, and make them more willing to borrow at the same time that lenders are more willing to lend to them. High export prices, usually for commodities, increase the country's income and incentivize investment.

As the bubble emerges, there are fewer productive investments, and at the same time there is more capital going after them. The fundamental attractiveness of the country that sparked the boom fades, in part because the rising currency is eroding the country’s competitiveness.

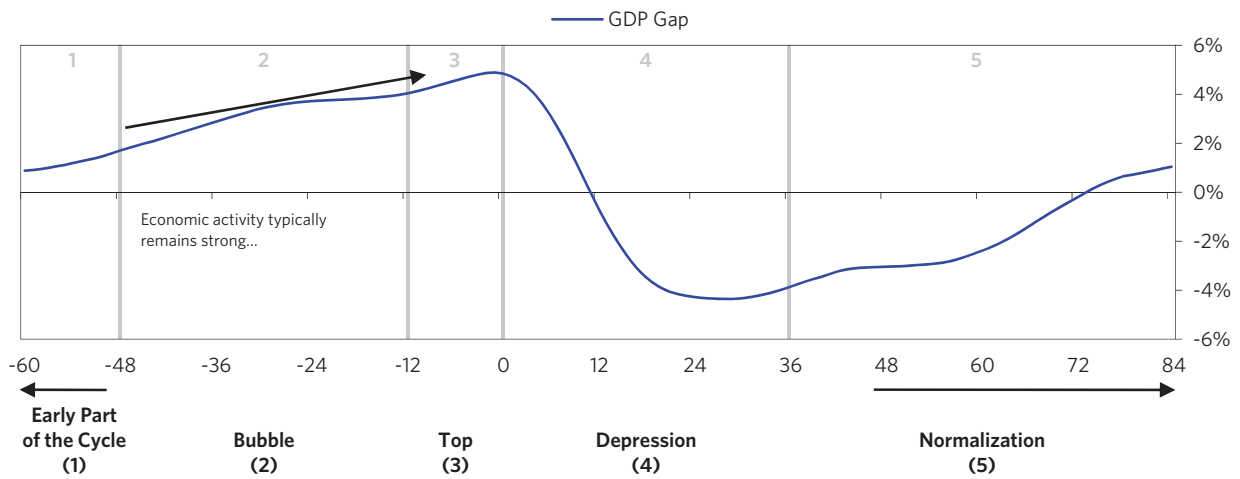
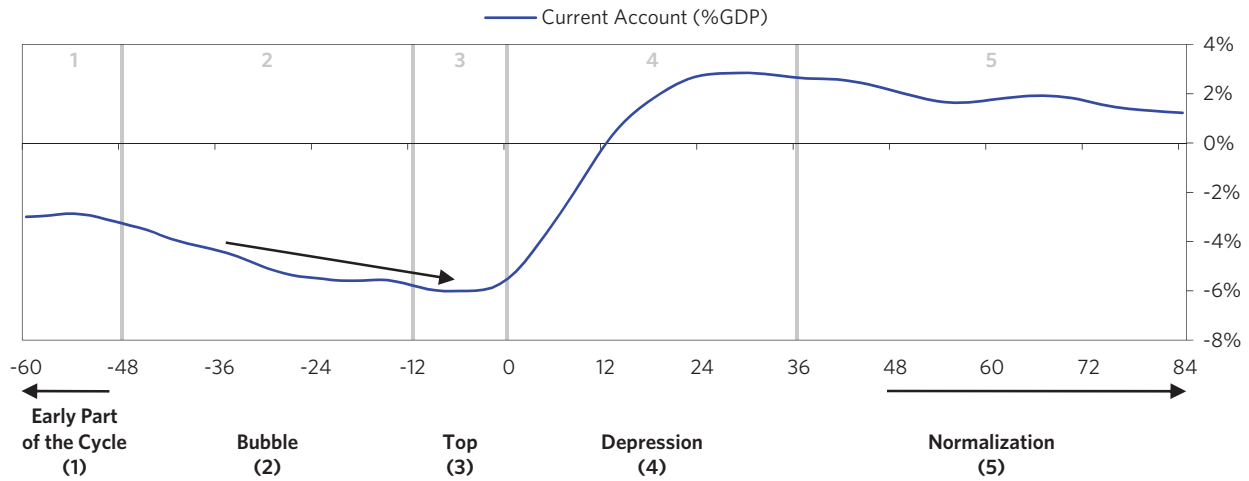
During this stage, growth is increasingly financed by debt rather than productivity gains, and the country typically becomes highly reliant on foreign financing. This shows up in foreign currency denominated debt rising. These emerging countries typically borrow primarily from abroad with debts denominated in foreign currencies because of a combination of factors—including the local financial system not being well developed, less faith in lending in the local currency, and a smaller stock of domestic savings available to be lent out. Asset prices rise, and the economy is strong. This creates both higher levels of spending in the economy and higher levels of obligations to pay in foreign currency in order to make debt-service payments. As with all debt cycles, the positive effects come first and the negative effects come later.

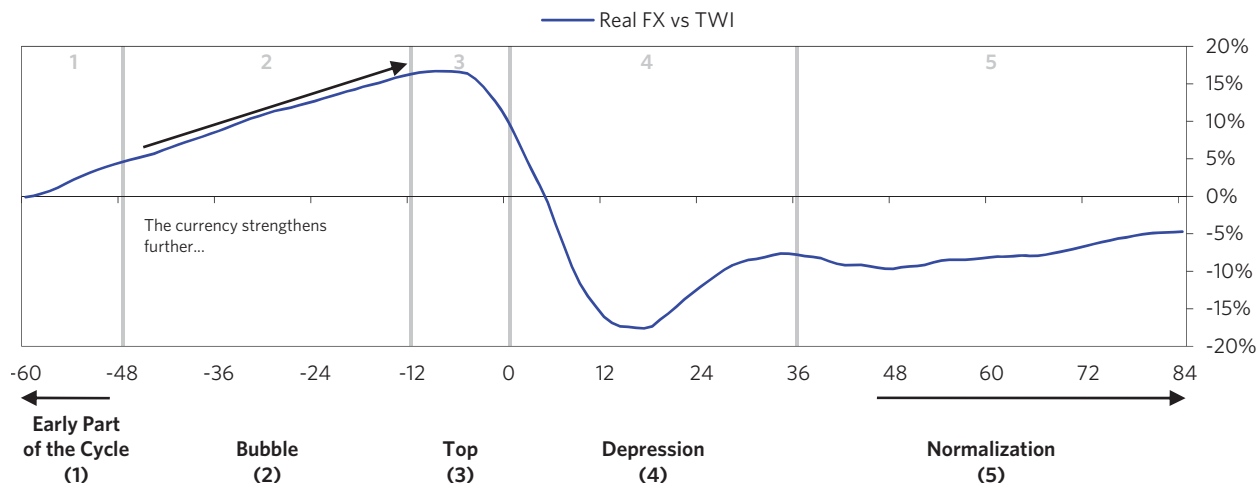
- Debt burdens rise fast. Debt to GDP rises at an annual rate of about 10 percent over three years.
- Foreign-currency debt rises (on average to around 35 percent of total debt and to around 45 percent of GDP).
- Typically, the level of economic activity (i.e., the GDP gap) is very strong and growth is well above potential, leading to tight capacity (as reflected in a GDP gap of around +4 percent).

The charts below convey what happens to debt and the current account in the average of the 27 inflationary deleveraging cases (which we call the “archetype”). Just as I did with the deflationary deleveraging archetype charts, I highlight each of the stages (with the “zero” point on the charts representing the top in economic activity). Classically, during the bubble, debt as a percentage of GDP rises from around 125 percent to about 150 percent, and the current account deteriorates by about 2 percent of GDP.



During the bubble, the gap between the country's income and its spending widens. The country requires an increasing inflow of capital to drive continued growth in spending. But levels of economic activity can remain strong at the top of the cycle only as long as continued inflows, motivated by expectations of continued high growth, drive up asset prices and cause the currency to strengthen further. At this point, the country is increasingly fragile and even a minor event can trigger a reversal.





Below we summarize the conditions through the upswings that led to the 27 inflationary deleveragings we looked at. We break out the cases with higher and lower levels of foreign-denominated debt and the cases that eventually had the least and most extreme economic outcomes (as measured by most severe declines in growth and equity prices and increases in unemployment and inflation). As you will see, the countries that were most externally reliant through the upswing and experienced the biggest asset bubbles ultimately experienced the most painful outcomes.

Inflationary Deleveragings
Average Conditions through the Bubble

	Foreign FX Debt (% Total) at Top	Foreign FX Debt (%GDP) at Top	Equities (USD) 3yr Chg	Capital Inflows (%GDP) at Top	Current Account (%GDP) at Top	Reserves (%GDP) at Top
Average All Cases	34%	46%	18%	12%	-6%	10%
Worst 1/3 Outcomes*	41%	46%	41%	14%	-9%	8%
Best 1/3 Outcomes*	25%	41%	7%	8%	-4%	10%
Higher FX Debt	51%	60%	25%	15%	-9%	8%
Lower FX Debt	29%	38%	12%	9%	-3%	10%

*Based on economic severity index, which measures severity of economic conditions

3) The Top and Currency Defense

The top-reversal/currency-defense occurs when the bubble bursts—i.e., when the flows that caused the bubble and the high prices of the currency level, the high asset prices and the high debt growth rates finally become unsustainable. This sets in motion a mirror-opposite cycle from what we saw in the upswing, in which weakening capital inflows and weakening asset prices cause deteriorating economic conditions, which in turn cause capital flows and asset prices to weaken further. This spiral sends the country into a **balance of payments crisis and an inflationary depression**.

Because at the top people are so invested in the optimistic scenario, and because that optimism is reflected in the prices, even a minor event can trigger a slowing of foreign capital inflows and an increase in domestic capital outflows. Though worsening trade balances typically play a role (usually because of the high currency level and excessive domestic consumption that led to high imports), adverse shifts in capital flows are usually more important.

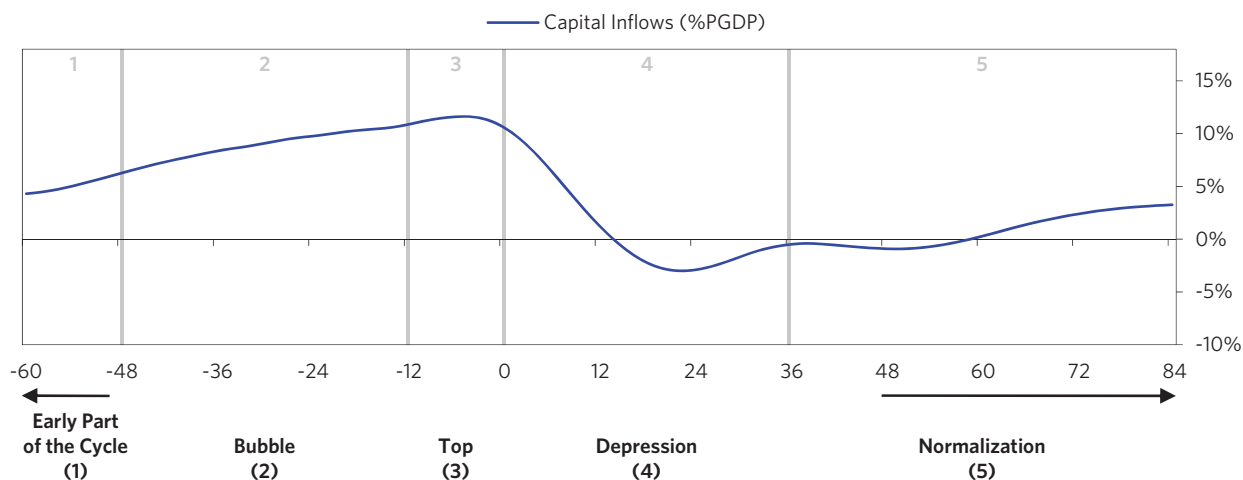
The circumstances that could set off such a crisis are akin to what might set off financial difficulties for a family or individual—a loss of income or credit tightening, a big increase in costs (such as rising gasoline or heating oil prices), or having borrowed so much that repayment becomes difficult. Any one of these shocks would create a gap between the amount of money coming in and the amount of money being spent, which has to be closed somehow.

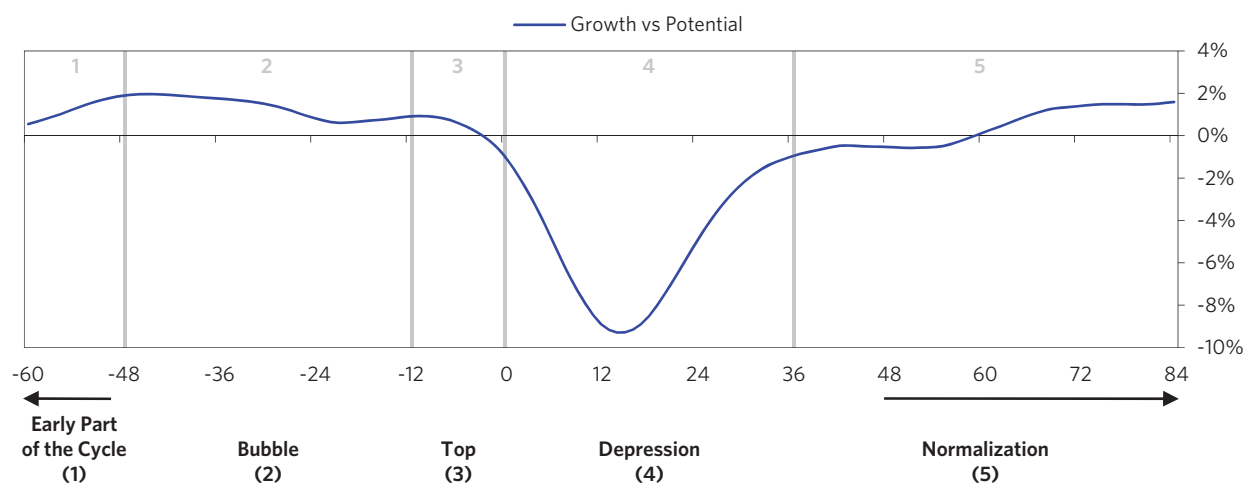
In the typical cycle, the crisis arises because the unsustainable pace of capital that drove the bubble slows, but in many cases, there is some sort of a shock (like a decline in oil prices for an oil producer). Generally the causes of the top-reversal fall into a few categories:

- 1) *The income from selling goods and services to foreigners drops* (e.g., the currency has risen to a point where it's made the country's exports expensive; commodity-exporting countries may suffer from a fall in commodity prices).
- 2) *The costs of items bought from abroad or the cost of borrowing rises.*
- 3) *Declines in capital flows coming into the country* (e.g., foreign investors reduce their net lending or net investment into the country). This occurs because:
 - a) The unsustainable pace naturally slows,
 - b) Something leads to greater worries about economic or political conditions, or
 - c) *A tightening of monetary policy in the local currency and/or in the currency those debts are denominated in* (or in some cases, tightening abroad creates pressure for foreign capital to pull out of the country).
- 4) A country's own citizens or companies *want to get their money out of their country/currency.*

Weakening capital flows are often the first shoe to drop in a balance of payments crisis. They directly cause growth to weaken because the investment and consumption they had been financing is reduced. This makes domestic borrowers seem less creditworthy, which makes foreigners less willing to lend and provide capital. So, the weakening is self-reinforcing.

- Growth slows relative to potential as the pace of capital inflows slows.
- Domestic capital outflows pick up a bit.
- Export earnings fall, due to falling prices or falling quantities sold. Typically exports are flat, no longer rising.





The shift in capital and income flows drives asset prices down and interest rates up, slowing the economic growth rates that were dependent on the inflows. This worsens the fundamentals of companies and further drives out capital flows. The economy suffers a debt bust—asset prices fall and banks fail.

During this stage, worry increases on the part of both asset/currency holders and the policy makers who are trying to support the currency. Asset/currency holders typically worry that policy makers will impose restrictions on their ability to get their money out of the country, which encourages them to get their money out while they still can, which further increases the balance of payments problem. Policy makers worry about capital outflows and the possibility of a currency collapse. As the balance of payments deteriorate, the central bank's job becomes more difficult—i.e., it gets less economic growth per unit of inflation because the negative flows lead the currency to depreciate, interest rates to rise, and/or reserves to decline, depending on how the central bank chooses to handle it.

At this stage, central banks typically try to defend their currencies by a) filling the balance of payments deficit by spending down reserves and/or b) raising rates. These currency defenses and managed currency declines rarely work because the selling of reserves and/or the raising of interest rates creates more of an opportunity for sellers, while it doesn't move the currencies and interest rates to the levels that they need to be to bring about sustainable economic conditions. Let's look at this typical defense and why it fails.

There is a critical relationship between a) the interest rate difference and b) the spot/forward currency relationship. The amount the currency is expected to decline is priced into how much less the forward price is below the spot price. For example, if the market expects the currency to fall by 5 percent over a year, it will need that currency to yield a 5 percent higher interest rate. The math is even starker when depreciation is expected over short periods of time. If the market expects a 5 percent depreciation over a month, then it will need that currency to yield a 5 percent higher interest rate over that month—and a 5 percent monthly interest is equivalent to an annual interest rate of about 80 percent¹⁰—a level that's likely to produce a very severe economic contraction in an already weak economy. Because a small expected currency depreciation (say 5 to 10 percent in a year) would equal a large interest rate premium (5 to 10 percent per year higher), this path is intolerable.

Said differently, a managed currency decline accompanied by falling reserves causes the market to expect continued future currency depreciation, which pushes up domestic interest rates (as described above), acting as a tightening at a time when the economy is already weak. Also, the expectation of continued devaluation will encourage increased capital withdrawals and devaluation speculation, widening the balance of payments gap and forcing the central bank to spend down more reserves to defend the currency (or abandon the planned gradual depreciation). Also, a currency defense by spending reserves will have to stop because no sensible policy maker will want to run out of such "savings." In such currency defenses, policy makers—especially those defending a

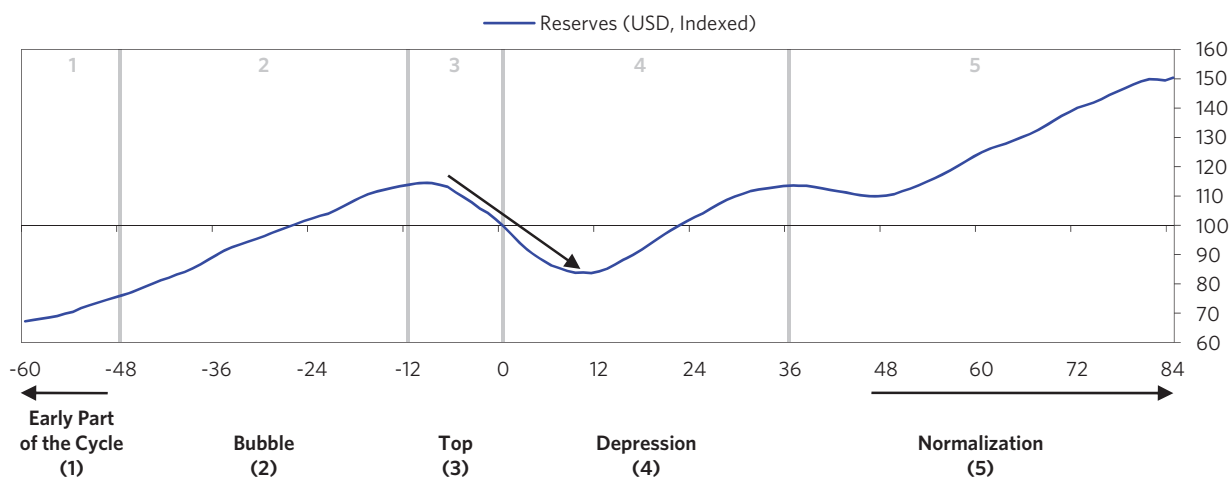
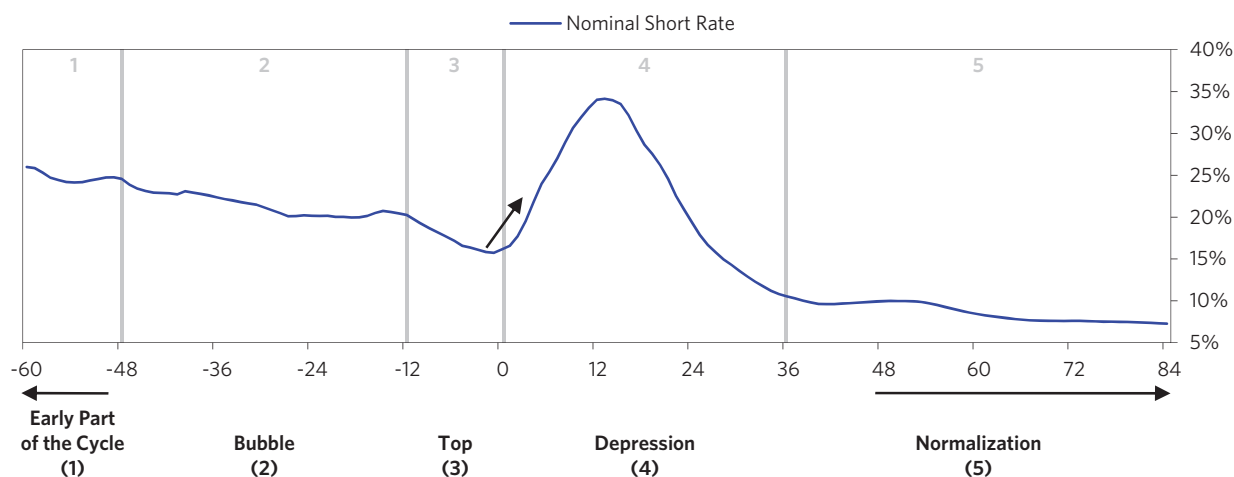
¹⁰ It's 80 percent instead of 60 percent (5 percent times 12 months) because of compounding.

peg—will typically make boldly confident statements vowing to stop the currency from weakening. All of these things classically happen just before the cycle moves to its next stage, which is letting the currency go.

It is typical during the currency defense to see the forward currency price decline ahead of the spot price. This is a consequence of the relationship between the interest rate differential and the spot/forward currency pricing that I discussed above. To the extent that the country tightens monetary policy to try to support the currency, they are just increasing the interest rate differential to artificially hold up the spot currency. While this supports the spot, the forward will continue to decline relative to it. As a result, what you see is essentially a whip-like effect, where the forward tends to lead the spot downward as the interest rate differential increases. The spot then eventually catches up after the currency is let go, and the fall in the spot exchange rate allows the interest differential to narrow, which mechanically causes the forward to rally relative to the spot.

At this point in the cycle, capital controls are a third (often last ditch) lever that seldom works. They can seem attractive to policy makers, since they directly cause fewer people to take their capital out of the country. But history shows that they usually fail because a) investors find ways to get around them and b) because the very act of trying to trap people leads them to want to escape. The inability to get one's money out of a country is analogous to one's inability to get one's money out of a bank: fear of it can lead to a run. Still, capital controls sometimes can be a temporary fix, though in no case are they a sustained fix.

Usually, this currency defense phase of the cycle is relatively brief, in the vicinity of six months, with reserves drawn down about 10 to 20 percent before the defense is abandoned.



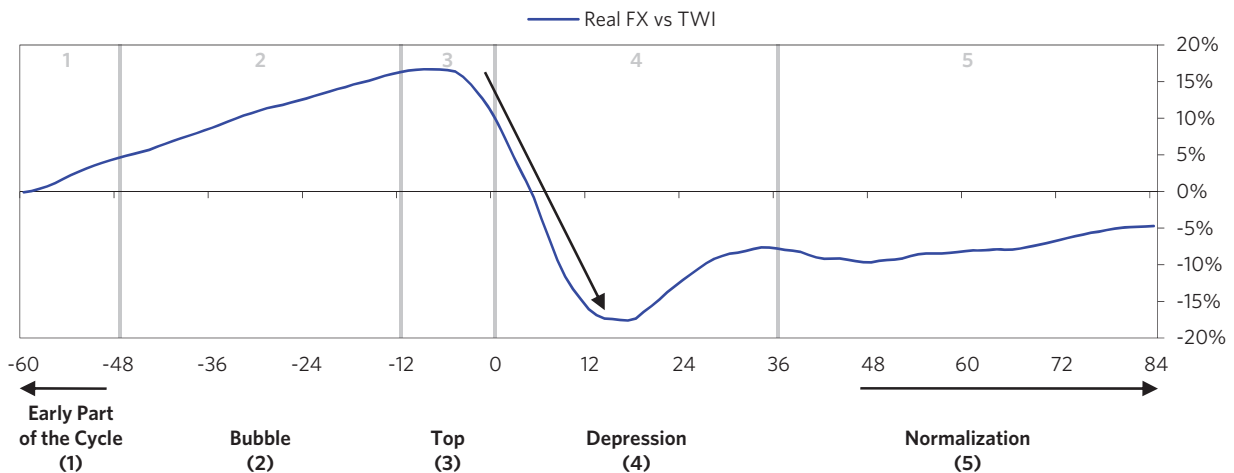
4) The Depression (Often When the Currency Is Let Go)

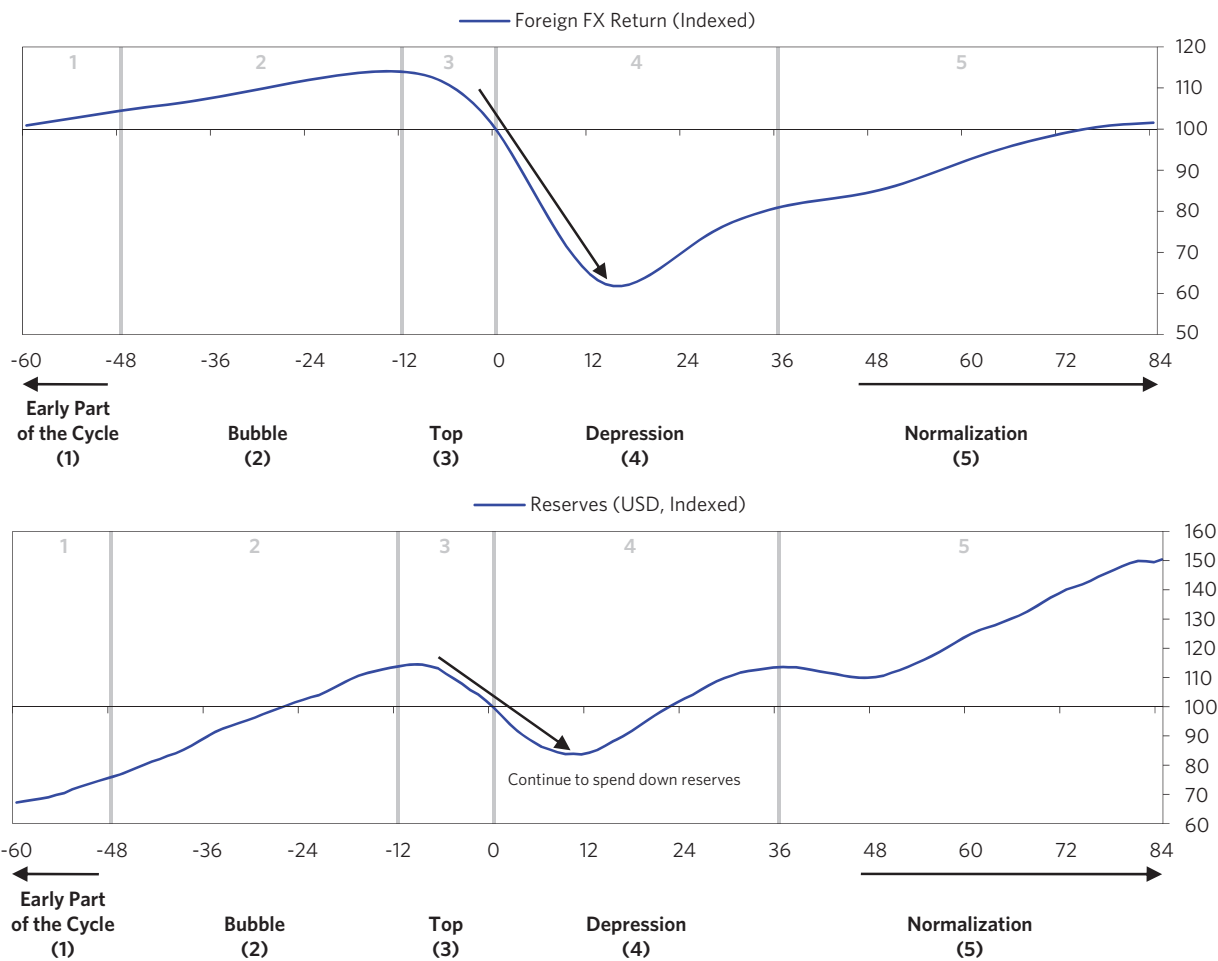
As mentioned above, a country's inflationary deleveraging is analogous to what happens when a family has trouble making payments—with one major difference. Unlike a family, a country can change the amount of currency that exists, and hence, its value. That creates an important lever for countries to manage balance of payments pressures, and it's why the world doesn't have one global currency. Changing the value of the currency changes the price of a country's goods and services for foreigners at a different rate than it does for its citizens. Think about it this way: if a family's breadwinner lost his/her job and would have to take a 30 percent pay cut to get a new one, that would have a devastating economic effect on the family. But when a country devalues its currency by 30 percent, that payout becomes a 30 percent pay cut only relative to the rest of the world; the wages in the currency the family cares about stay the same. In other words, currency declines allow countries to offer price cuts to the rest of the world (helping to bring in more business) without producing domestic deflation.

So after supporting the currency in unsustainable ways (i.e., expending reserves, tightening monetary policy, making very strong assurances that there will not be a devaluation of the currency, and sometimes imposing foreign exchange controls), policy makers typically stop fighting and let the currency decline (though they generally try to smooth its fall).

Here is what we typically see after policy makers let the currency go:

- The currency has a big initial depreciation, on average declining around 30 percent in real terms
- The decline in the currency is not offset by tighter short rates, so that the losses from holding the currency are significant (on average, around 30 percent in the first year)
- Because the decline is very severe, policy makers try to smooth it, leading them to continue to spend down reserves (on average, by another 10 percent for a year into the bust)





Central banks should not defend their currencies to the point of letting their reserves get too low or their interest rates too high relative to what is good for the economy because the dangers those conditions pose are greater than the dangers of devaluation. In fact, devaluations are stimulative for the economy and markets, which is helpful during the economic contraction. The currency decline tends to cause assets to rise in value measured in that weakened currency, stimulate export sales, and help the balance of payments adjustment by bringing spending back in line with income. It also lowers imports (by making them more expensive), which favors domestic producers, makes assets in that currency more competitively priced and attractive, creates better profit margins for exported goods, and sets the stage for the country to earn more income from abroad (through cheaper and more competitive exports).

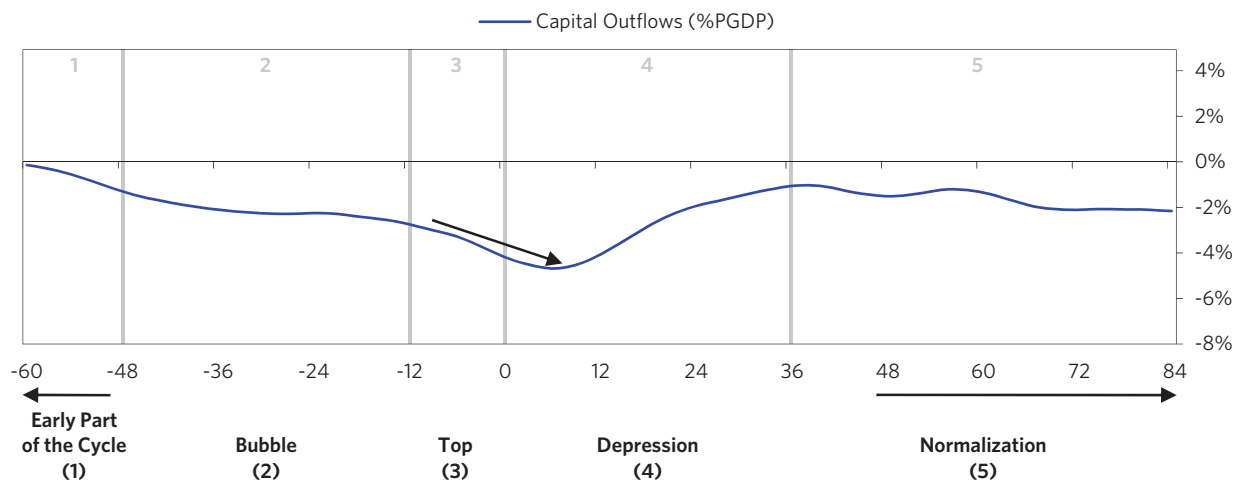
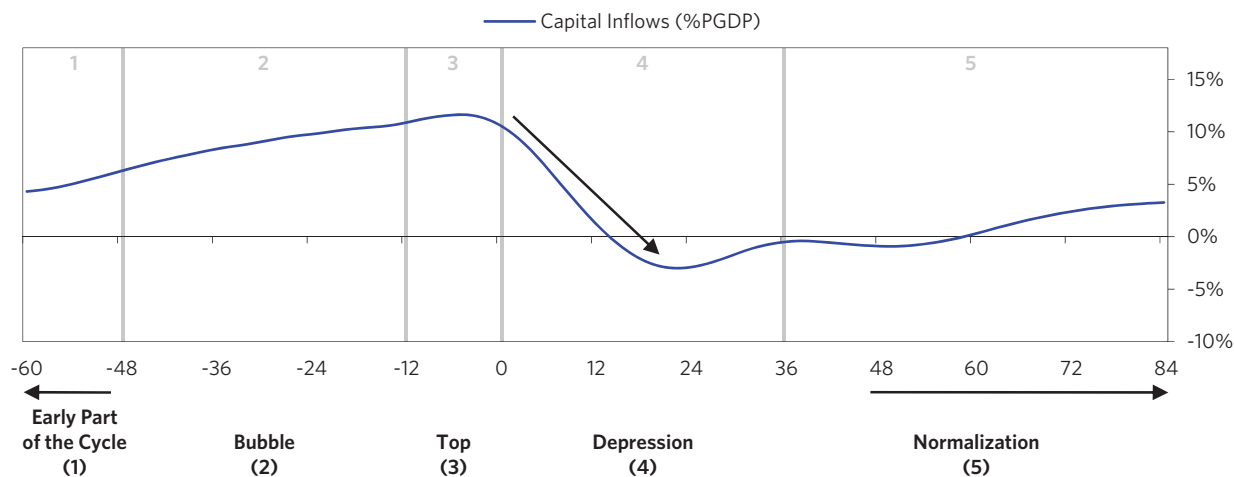
But currency declines are double-edged swords; how policy makers manage them greatly impacts the amount of pain the economy must endure during the adjustment. The nature of the currency decline greatly impacts how much inflation increases and how the inflationary depression plays out. In all inflationary depressions, currency weakness translates to higher prices for imported goods, much of which is passed on to consumers, resulting in a sharp rise in inflation. A gradual and persistent currency decline causes the market to expect continued future currency depreciation, which can encourage increased capital withdrawal and speculation, widening the balance of payments gap. A continual devaluation also makes inflation more persistent, feeding an inflation psychology.

That's why it's generally better to have a large, one-off devaluation that gets the currency to a level where there's a two-way market for it (i.e., where there isn't broad expectation that the currency will continue to weaken so people are both buying and selling it). This means higher inflation is less likely to be sustained. And if the one-off devaluation isn't expected by the market (i.e., it's a surprise), then policy makers won't have to spend reserves and/or allow interest rates to rise to defend the currency going into the devaluation. This is why policy makers generally say they'll continue to defend the currency right up until the moment they stop doing it.

After policy makers first let the currency go—stinging savers and creating expectations/fears of further devaluation—people push to get out of their positions in the currency. Many people had likely acquired big asset-liability mismatches, taken on because they were profitable at the time. That makes the reversal self-sustaining, because when the currency weakens, the mismatches all of a sudden go from being profitable to unprofitable.

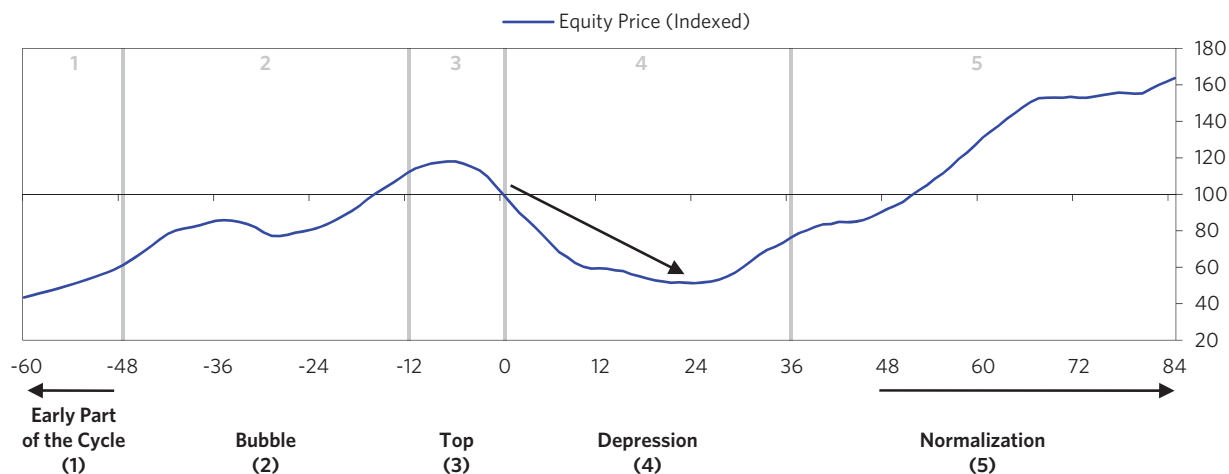
When the capital is no longer available, the spending is forced to stop. Even those who aren't borrowing from abroad are impacted. Since one person's spending is another person's income, the effects ripple through the economy, causing job losses and still less spending. Growth grinds to a halt. Lenders, especially domestic banks, have debt problems. Foreigners become even less willing to lend and provide capital.

- Typically capital inflows dry up, falling fast (by more than 5 percent of GDP in less than 12 months)
- Capital outflows continue (at a pace of -3 to -5 percent of GDP)



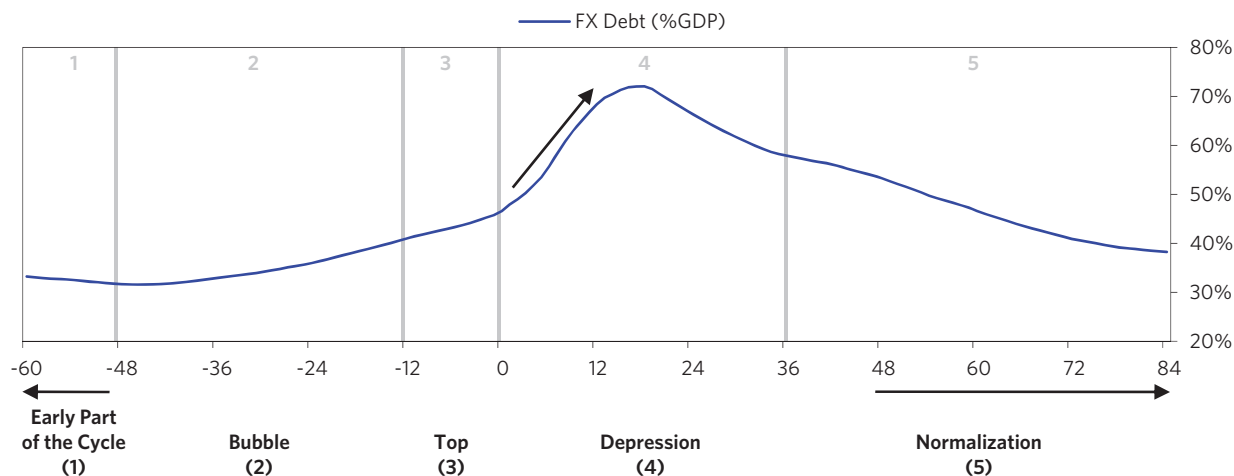
Typically the pullback in capital is not offset much by the central bank printing money, as printing risks enabling more people to get out of the currency, worsening capital flight. Weaker growth causes investors to pull their money out anyway; the assets that had been seen as a fabulous treasure a short time ago now look like trash. They quickly go from overbought to oversold and prices plummet.

- Nominal short rates rise (typically by about 20 percentage points) and the yield curve inverts.
- Printing is limited (1 to 2 percent of GDP, on average).
- Equities in local currency terms fall (*on average by around 50%*). They perform even worse in foreign currency terms, as the currency decline exacerbates the equity sell-off.



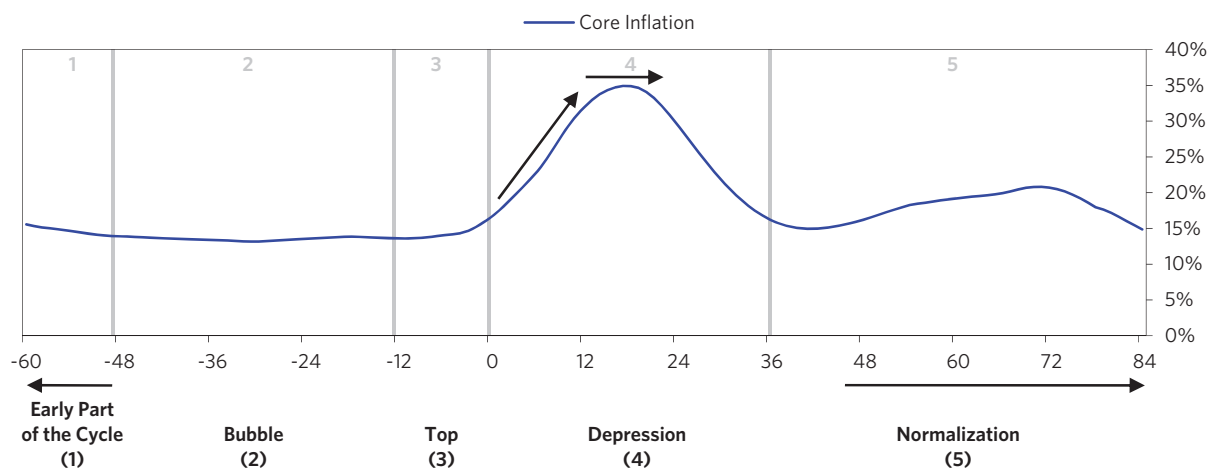
One of the most important asset/liability mismatches is foreign-denominated debt. As their local currency depreciates, debtors who owe foreign currency debt face a rising debt burden (in local currency). There is not much that borrowers can do, so they typically sell local currency to pay back debts, put on hedges, and move more savings into foreign currency, all of which contributes further to the cycle of downward pressure on the local currency.

- Debt service rises further (on average by more than 5 percent of GDP) because incomes fall and foreign currency-denominated debt service becomes higher when measured in local currency, further squeezing incomes and spending.
- FX debt burdens rise on those who borrowed in foreign currency (debt-to-GDP rises on average by about 20 percent from the decline in incomes and the currency).



The currency declines also push up inflation as imports become more expensive.

- Inflation rises (typically by 15 percent, peaking around 30 percent).
- Inflation stays elevated for a while, on average for about two years from the top.



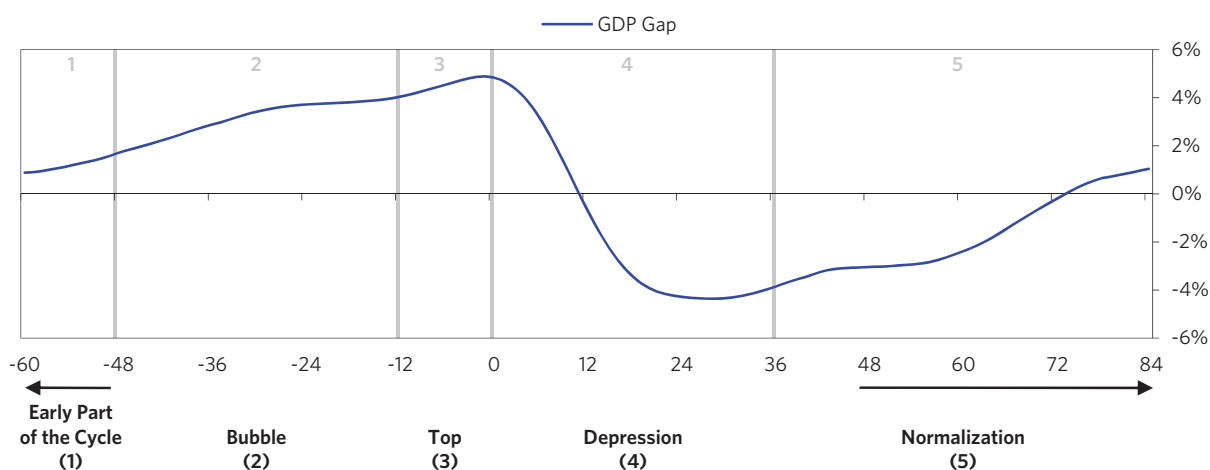
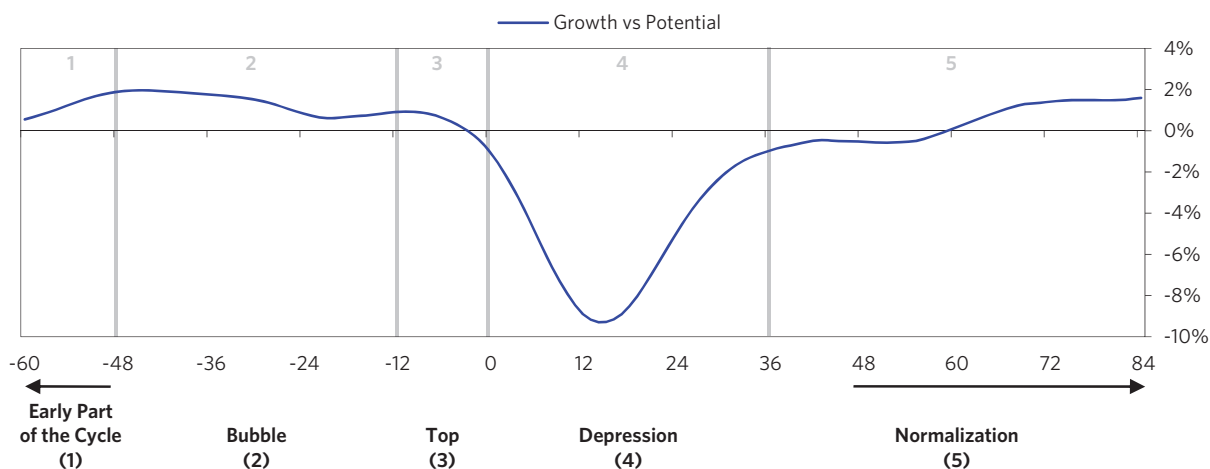
During this phase, the pendulum swings from most everything looking great to most everything looking terrible. Different types of problems—debt, economic, political, currency, etc.—reinforce each other. Hidden problems like fraudulent accounting and corruption typically come to the surface during such times. This bad environment discourages foreign money from coming in and encourages domestic investors to get their money out of the country.

This is when countries usually “hit the bottom.” The bottom is the mirror opposite of the bubble stage. While investors during the bubble are aggressively getting in, investors during the catharsis are aggressively getting out. Those losing money in asset and currency positions flee from them in a panic; those who had been thinking of getting in don’t want to go near the place—so a big supply/demand imbalance occurs in which a shortage of buyers and surplus of sellers drive prices lower. This is the most severe and painful part of inflationary deleveraging, as the downward spiral is self-reinforcing and rapid. “Hitting bottom” is typically so painful that it produces a radical metamorphosis in pricing and policies that ultimately produces the changes that are needed to turn things around. That is why I use the word “catharsis” when describing hitting bottom. In theater (or for that matter, in one’s own personal life) crisis sows the seeds for change and ultimately renewal.

Because the currency has become very cheap, spending on imports is finally cut substantially enough to restore the balance of payments. That—plus, sometimes, international aid (e.g., from the IMF, BIS, and/or other multinational organizations)—creates the necessary adjustments. Often there are big political shifts, from those who had been pursuing fundamentally bad policies to those who will pursue economically sound ones.

Here are some key economic developments that characterize this phase:

- The level of economic activity (GDP gap) falls a lot (on average by about 8 percent)
- Unemployment rises
- The bottom in activity comes after about one year, with the trough in the GDP gap typically near -4 percent



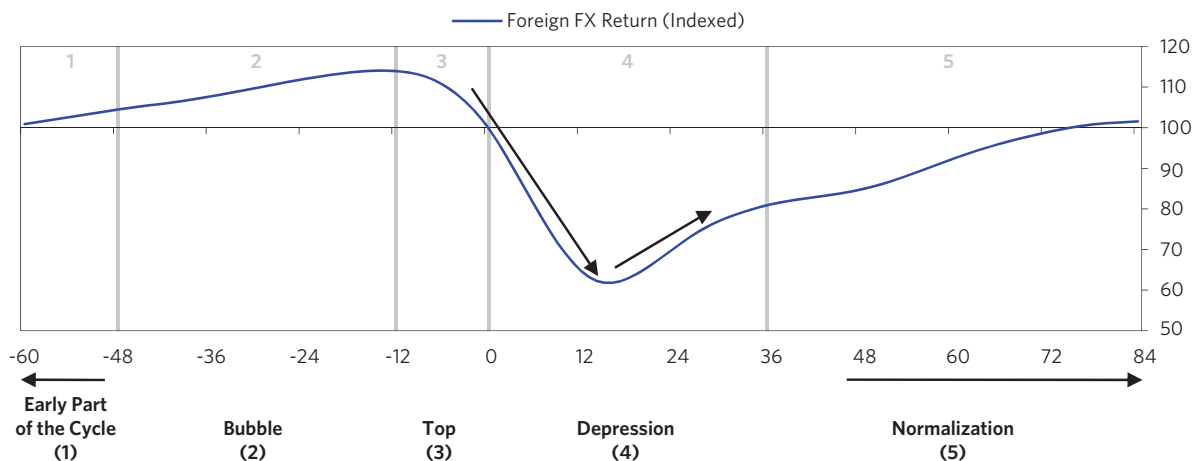
5) Normalization

The reversal and eventual return to normalcy comes when there is a balance between the supply and the demand for the currency relative to those of other currencies. While this balance is partially made via trade adjustments, it is typically more determined by capital flows, so it primarily comes when the central bank succeeds in making it desirable to hold the currency again, and secondarily when spending and imports have fallen sufficiently to bring about an adjustment in the balance of payments.

So how can policy makers keep capital in the country by making it desirable to be long—encouraging people to lend and save in the currency and not to borrow in it? Most importantly, they need to produce a positive total return for the currency at an acceptable interest rate (i.e., at an interest rate that isn't too high for domestic conditions). While most people, including most policy makers, think that the best thing they can do is defend the currency during the currency defense phase, actually the opposite is true, because a currency level a) that is good for the trade balance, b) that produces a positive total return, and that c) has an interest rate that is appropriate for domestic conditions, is a low one.

As explained earlier, the best way to bring that about is to let the currency depreciate sharply and quickly. While that will hurt those who are long that currency, it will make it more attractive for investors who will get long after the devaluation, because the total return on holding the currency (i.e., the spot currency appreciation plus the interest rate difference) is more likely to be positive, and at a sharply depreciated currency level it won't take an intolerably high interest rate to make the total return attractive. In other words, the best way to ensure that investors expect positive total returns going forward at a relatively low real interest rate (which is what the weak domestic conditions need) is to depreciate the currency enough.¹¹

Both the balance of payments fundamentals and the central bank's willingness to control "money printing" and currency depreciations will determine whether the total return of the currency (i.e., the currency changes plus interest rate differences) will be positive or negative, which will influence the willingness to own or be short the currency. Devaluing currencies is like using cocaine, in that it provides short-term stimulation but is ruinous when abused. It's very important to watch what central banks do before you decide whether or not it's prudent to take a long position. If investors are burned with negative returns for too long and the currency keeps falling, that's frequently the break-point that determines if you're going to have an inflationary spiral or not. The central bank's objective should be to allow the currency to get cheap enough that it can provide the needed stimulation for the economy and the balance of payments, while running a tight enough policy to make the returns of owning the currency attractive. As you can see in the chart below, returns to holding the currency for foreigners start out negative, but then rally about a year after the devaluation.



Even if the country as a whole hasn't hit its debt limits, frequently, certain entities within the country have, and policy makers must recapitalize systemically important institutions and provide liquidity in a targeted way to manage bad debts. By providing this targeted liquidity (typically by printing money) where needed, they can help avoid a debt crisis that could be contractionary or could cause additional rounds of capital flight, but the inflationary nature of this money printing needs to be balanced carefully.

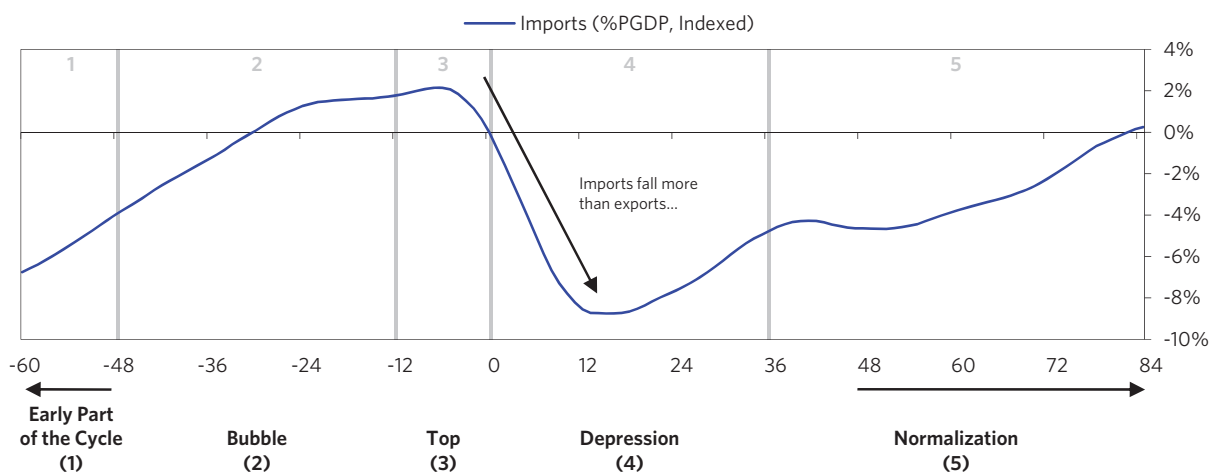
¹¹ When it comes to determining whether or not to save in a credit instrument, the motivations of domestic investors are different than those of foreign investors. Domestic investors care about the inflation rate relative to interest rates. For them, if inflation is high relative to the interest rates that they are getting to compensate them for it, they will move out of holding credit instruments to holding inflation hedge assets (and vice versa). Foreign lenders just care about the rate of change in the currency relative to the interest rate change. So for policy makers hoping to stabilize the balance of payments, inflation is a secondary consideration compared to ensuring that there are positive expected returns for saving in that currency. They have to get the currency cheap enough so that it, with the desired interest rate, will produce a positive return.

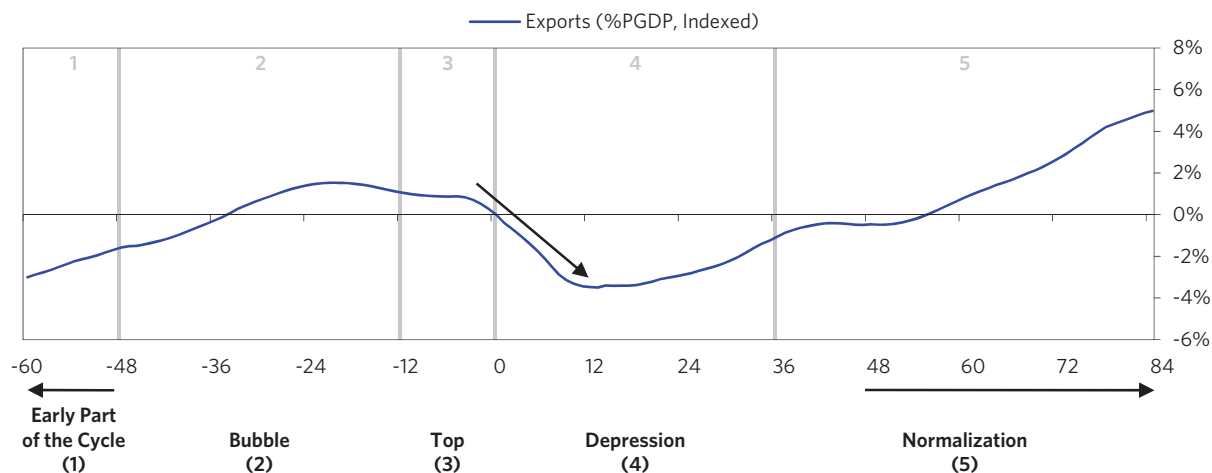
Here is what we typically see when the country reaches the bottom:

- The collapse in imports improves the current account a lot (on average by about 8 percent of GDP).
- Capital inflows stop declining and stabilize.
- Capital flight abates.
- Frequently, the country turns to the IMF or other international entities for support and a stable source of capital, especially when its reserves are limited.
- Short rates start to come down after about a year, but long rates continue to stay relatively elevated. After peaking, short rates fall back to their pre-crisis levels in around two years. The decline in short rates is stimulative.
- As interest rates come down, the forward currency price rallies relative to the spot.
- As the currency stabilizes, inflation comes down. Usually it takes nearly two years after the bottom for inflation to reach pre-crisis levels.

Of course, these are all averages, and the actual amounts depend on each country's particular circumstances (which we will look at in the next section).

The sizable and painful decline in domestic conditions also helps to close the balance of payments gap by bringing down spending and imports. Through the crisis, the average country's imports contract by around 10 percent as growth collapses and the equity market falls by over 50 percent. Classically, the collapse in imports brings the current account into a surplus of 2 percent of GDP, rising from a deficit of -6 percent of GDP about 18 months into the crisis. In the earlier stages of the crisis exports play a smaller role; they actually tend to contract during the worst of the crisis (as other countries are sometimes seeing economic slowdowns too). They rebound in the subsequent years.





Below, we provide a summary of what well-managed and poorly managed versions of these adjustments looks like.

	Well-Managed	Poorly Managed
Managing the Currency	<ul style="list-style-type: none"> Policy makers bluff, conveying that they will never allow the currency to weaken much. When they do devalue, it's a surprise. The devaluation is large enough that the people are no longer broadly expecting the currency weakening more (creating a two-way market). 	<ul style="list-style-type: none"> Policy makers are widely expected to allow a currency weakness, causing more downward pressure on the currency and higher interest rates. The initial devaluation is small, and further devaluations are needed. The market expects this, causing higher interest rates and inflation expectations.
Closing External Imbalances	<ul style="list-style-type: none"> Tight monetary policy causes domestic demand to contract in line with the fall in incomes. Policy makers create incentives for investors to stay in the currency (i.e., higher interest rates that compensate for risk of currency depreciation). 	<ul style="list-style-type: none"> Policy makers favor domestic conditions, and monetary policy is too loose, putting off domestic pain and stoking inflation. Policy makers attempt to stop the outflow of capital with capital controls or other restrictive measures.
Smoothing the Downturn	<ul style="list-style-type: none"> Use reserves judiciously to smooth the withdrawal of foreign capital while working to close imbalances. 	<ul style="list-style-type: none"> Rely on reserve sales to maintain higher levels of spending.
Managing Bad Debts/Defaults	<ul style="list-style-type: none"> Work through debts of entities that are over-indebted, making up the gap with credit elsewhere. 	<ul style="list-style-type: none"> Allow disorderly defaults that lead to increased uncertainty and capital flight.

Typically it takes a few years for the country to recover. Investors who were burned on their investments from the last cycle are reluctant to return, so it can take some time before capital inflows become strongly positive. But the price of domestic goods and domestic labor fell with the currency, so the country is an attractive destination for foreign investment and the capital starts to come back. Together, higher exports and foreign direct investment kickstart growth. If policy makers protect and recapitalize critical financial institutions, the domestic financial pipelines are in place to support a recovery. The country is back to the early part of the cycle and starts a new virtuous cycle where productive investment opportunities attract capital, and capital drives up growth and asset prices, which attracts more capital.

- Incomes and spending pick up (usually after about one to two years).
- It then takes several years (usually about three) from the bottom before the level of activity is back to average.
- The real FX is undervalued (typically by around 10 percent on a PPP basis) at the start of stabilization and stays cheap.
- Exports pick up a bit (by 1 to 2 percent of GDP).
- Capital inflows start to return a few years later (on average four to five). Equities take about the same amount of time to recover in foreign currency terms.

The Spiral from a More Transitory Inflationary Depression to Hyperinflation

While in many cases policy makers are able to engineer a recovery in which incomes and spending pick up and inflation rates return to more typical levels (transitory balance of payments crises), a subset of inflationary depressions do spiral into hyperinflations. Hyperinflations consist of extreme levels of inflation (goods and services prices more than doubling every year or worse) coupled with extreme losses of wealth and severe economic hardship. Because these cases are more common than one might think, it is worth walking through how inflationary depressions spiral into hyperinflations.

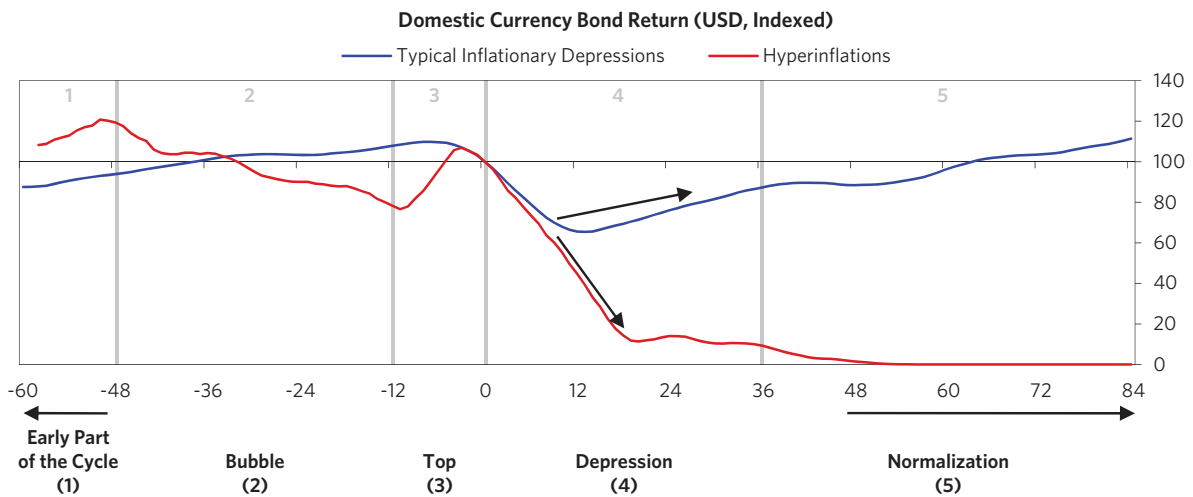
The most important characteristic of cases that spiral into hyperinflations is that policy makers don't close the imbalance between external income, external spending, and debt service, and keep funding external spending over sustained periods of time by printing lots of money. In some cases, it's not voluntary. Weimar Germany had a crushing external debt service burden (war reparations) that for the most part couldn't be defaulted on. The amount of capital that needed to flow out of the country was so great that it was all but destined that Weimar would face big inflation problems (see our case study for more color). In other cases, policy makers choose to keep printing money to cover external spending—in effect, aiming to prop up growth rather than bringing spending in line with income. If this is done repeatedly over years and on a large scale, a country might face a hyperinflation that could have otherwise been avoided.

As stated earlier, contrary to popular belief, it's not so easy to stop printing money during a crisis. Stopping printing when capital is flowing out can cause an extreme tightness of liquidity and often a deep economic contraction. And the longer the crisis goes on, the harder it becomes to stop printing money. For instance, in Weimar Germany there was literally a shortage of cash because the hyperinflation meant that the existing stock of money could buy less and less. (By late October 1923, toward the end of the crisis, Germany's entire 1913 stock of money would have just about gotten you a one-kilo loaf of rye bread.) To stop printing would have meant there was so little cash that commerce would have virtually ground to a halt (at least until they came up with an alternate currency). In an inflation spiral, printing money can seem like the prudent choice at the time—but continuing to print money time and time again feeds the inflation spiral until there is no way out.

How the Spiral Plays Out

Over time, as the currency declines and printing is used more and more, people begin to shift their behavior and an inflationary psychology sets in. Currency declines inspire additional capital flight, which causes an escalating feedback loop of depreciation, inflation, and money printing. Eventually, the linkages that drove growth in earlier rounds decline and money printing become less effective.

With each round of printing, more of the printed money is transferred to real or foreign assets instead of being spent on goods and services that fuel economic activity. Since investors that shorted cash and bought real/foreign assets were repeatedly better off than those who saved and invested domestically, domestic currency holders shift from investing the printed money in productive assets to real assets (like gold) and foreign currency, in order to hedge inflation and a deterioration in their real wealth. Foreign investors stay away. Because the economy is weak and investors are buying real assets, stocks suffer and no longer provide the wealth effect that drove earlier rounds of spending. The result is a currency devaluation that doesn't stimulate growth. This dynamic is important to inflationary deleveragings, so we'll walk through it in detail.



When continual currency declines lead to persistent inflation, it can become self-reinforcing in a way that nurtures inflation psychology and changes investor behavior. A key way this occurs is when inflation pressures spread to wages and produce a **wage-cost spiral**. Workers demand higher wages to compensate for their reduced purchasing power. Compelled to raise wages, producers increase their prices to compensate. Sometimes this happens mechanically because of wage indexing—contracts in which employers agree to increase wages with inflation. As is normal in such cases of price and wage indexing, a vicious cycle is established: the currency depreciates, internal prices rise, the increase of the quantity of paper money once more lowers the value of the currency, prices rise once more, and so on.

With each successive currency decline, savers and investors also change their behavior. Savers, who were burned before, now move to protect their purchasing power. They are quicker to short cash and buy foreign and physical assets.

As inflation worsens, bank depositors understandably want to be able to get their funds on short notice, so they shorten their lending to banks. Deposits move to short-term checking accounts rather than longer-term savings. Investors shorten the duration of their lending, or stop lending entirely, because they are worried about risks of default or getting paid back in worthless money. During inflationary deleveragings, average debt maturities always fall.

It's also cheap to short cash, as higher inflation and money printing lower real interest rates, so the withdrawal of capital and faster borrowing cause illiquidity in the financial system. Banks find it practically impossible to meet the demand for cash. No longer able to fulfill their contracts because of cash shortages, businesses also suffer. At this point the choice for central banks, who remember the benefits of the previous round of currency declines, is between extreme illiquidity and printing money at an accelerating rate, and the path is again obvious—i.e., to print. They provide liquidity by printing money to support the banks, and often lending directly to businesses. When interest rates are insufficient to compensate for future currency declines, this provision of liquidity provides the funds that enable investors to continue to borrow and invest abroad and in inflation hedges (like real assets or gold), which further contributes to the inflation and depreciation spiral.

Because much of the country's debt is denominated in a foreign currency, debt burdens rise when the currency falls, which requires spending cuts and asset sales. While this effect was originally overcome by the stimulation of the falling currency, it becomes increasingly devastating as that effect fades and the debt burden grows. These higher debt burdens also mean foreign investors want higher interest rates as compensation for the risk of default. This means that currency declines and inflation often increase debt service and debt burdens, making it even harder to stimulate through the currency.

Many governments respond to rising debt burdens by raising taxes on income and wealth. With their net worths already eroding because of the bad economy and their failing investments, the wealthy desperately try to preserve their rapidly shrinking wealth at all costs. This leads to extremely high rates of tax evasion and increases the flight of capital abroad. This is typical in deleveragings.

As growth weakens further, the lack of foreign lending shuts down an important source of credit creation. And while there is a lot of domestic credit creation and borrowing, this borrowing does not result in much growth because so much of it is spent abroad on foreign assets. Of the spending that does occur locally, much of it doesn't contribute to GDP. For example, investors buy lots of gold, factories, or imports (even rocks in the case of the Weimar Republic!) as store holds of wealth. Capital investments like machinery and tools are purchased as stores of value, not because they were needed.

It's easy to see how these forces can create a feedback mechanism that causes inflation and currency declines to escalate until people completely lose faith in the currency. Money loses its role as a store of value (and people hold at most a few days' reserves). The long list of zeros also makes it an impossible unit of account. Money also breaks down as a medium of exchange, because the currency instability makes producers unwilling to sell their products for domestic currency, and producers often demand payment in foreign currencies or barter. Because there is a shortage of foreign exchange, illiquidity reaches its peak and demand collapses. This form of illiquidity can't be relieved by money printing. Stores close and unemployment rises. As the economy enters hyperinflation, it contracts rapidly because the currency declines that were once beneficial now just create chaos.

In addition to causing an economic contraction, hyperinflation wipes out financial wealth as financial assets fail to keep pace with currency depreciation and inflation. Hyperinflation also causes extreme wealth redistributions. Lenders see their wealth get inflated away, as do debtor's liabilities. Economic contraction, extreme wealth redistributions, and chaos create political tensions and clashes. Frequently public servants like police officers go on strike because they don't want to work for worthless paper money. Disorder, crime, looting, and violence typically reach their peak during this phase. In Weimar Germany, the government had to respond to the disorder by issuing a "state of siege," granting military authorities greater power over domestic policies such as carrying out arrests and breaking up demonstrations.

Investing during a hyperinflation has a few basic principles: get short the currency, do whatever you can to get your money out of the country, buy commodities, and invest in commodity industries (like gold, coal, and metals). Buying equities is a mixed bag: investing in the stock market becomes a losing proposition as inflation transitions to hyperinflation. Instead of there being a high correlation between the exchange rate and the price of shares, there is an increasing divergence between share prices and the exchange rate. So, during this time gold becomes the preferred asset to hold, shares are a disaster even though they rise in local currency, and bonds are wiped out.

Once an inflationary deleveraging spirals into hyperinflation, the currency never recovers its status as a store hold of wealth. Creating a new currency with very hard backing while phasing out the old currency is the classic path that countries follow in order to end inflationary deleveragings.

War Economies

War economies are totally different from regular economies in terms of what happens with the production, consumption, and accounting for goods, services, and financial assets. For example, the increasing GDP arising from the greater production of armaments which get destroyed in the war, the reduced unemployment rate due to increases in military service, shifts in production and profitability arising from the top-down allocation of resources, and the nature of borrowing, lending, and other capital flows are not the same as in periods of peace so understanding these statistics requires a whole different orientation. Trying to adequately convey how war economies work would take a whole different book, so I'm not going to delve deeply into the subject now, but I will touch on them briefly because they certainly are important in understanding the big debt crises that were captured within our sampling period—and they are very important to understand if we enter another war period.

The economic/geopolitical cycle of economic conflicts leading to military conflicts both within and between emerging powerful countries and established powerful countries is obvious to anyone who studies history. It's been well-described by historians, though those historians typically have more of a geopolitical perspective and less of an economic/market perspective than I do. In either case, it is well-recognized as classic by historians. The following sentence describes it as I see it in a nutshell:

When 1) within countries there are economic conflicts between the rich/capitalist/political right and the poor/proletariat/political left that lead to conflicts that result in populist, autocratic, nationalistic, and militaristic leaders coming to power, while at the same time, 2) between countries there are conflicts arising among comparably strong economic and military powers, the relationships between economics and politics become especially intertwined—and the probabilities of disruptive conflicts (e.g., wars) become much higher than normal.

In other words economic rivalries within and between countries often lead to fighting in order to establish which entities are most powerful. In these periods, we have war economies, and after them, markets, economies, and geopolitics all experience the hang-over effects. What happens during wars and as a result of wars have huge effects on which currencies, which debts, which equities, and which economies are worth what, and more profoundly, on the whole social-political fabric. At the most big-picture level, the periods of war are followed by periods of peace in which the dominant power/powers get to set the rules because no one can fight them. That continues until the cycle begins again (because of a rival power emerging).

Appreciating this big economic/geopolitical cycle that drives the ascendancies and declines of empires and their reserve currencies requires taking a much longer (250-year) time frame, which I will touch on briefly here and in more detail in a future report.

Typically, though not always, at times of economic rivalry, emotions run high, firebrand populist leaders who prefer antagonistic paths are elected or come to power, and wars occur. However, that is not always the case. History has shown that through time, there are two broad types of relationships, and that what occurs depends on which type of relationship exists. The two types of relationships are:

- a) **Cooperative-competitive relationships** in which the parties take into consideration what's really important to the other and try to give it to them in exchange for what they most want. In this type of win-win relationship, there are often tough negotiations that are done with respect and consideration, like two friendly merchants in a bazaar or two friendly teams on the field.
- b) **Mutually threatening relationships** in which the parties think about how they can harm the other and exchange painful acts in the hope of forcing the other into a position of fear so that they will give in. In this type of lose-lose relationship, they interact through “war” rather than through “negotiation.”

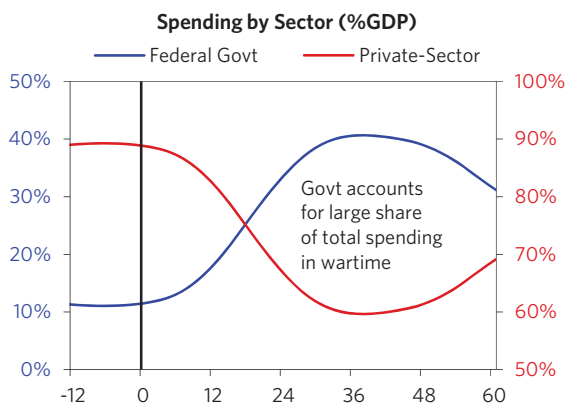
Either side can force the second path (threatening war, lose-lose) onto the other side, but it takes both sides to go down the cooperative, win-win path. Both sides will inevitably follow the same approach.

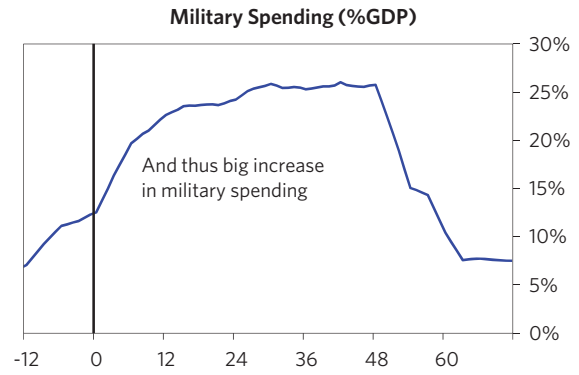
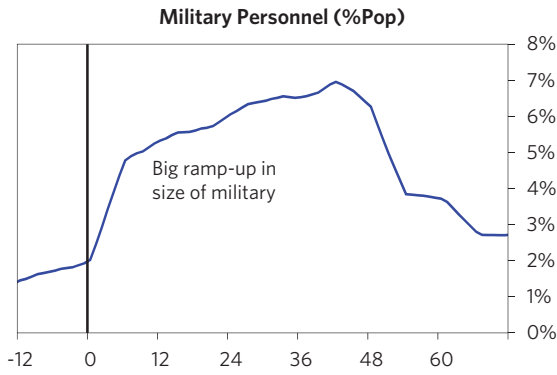
In the back of the minds of all parties, regardless of which path they choose, should be their relative powers. In the first case, each party should realize what the other could force on them and appreciate the quality of the exchange without getting too pushy, while in the second case, the parties should realize that power will be defined by the relative abilities of the parties to endure pain as much as their relative abilities to inflict it. When it isn't clear exactly how much power either side has to reward and punish the other side because there are many untested ways, the first path is the safer way. On the other hand, the second way will certainly make clear—through the hell of war—which party is dominant and which one will have to be submissive. That is why, after wars, there are typically extended periods of peace with the dominant country setting the rules and other countries following them for the time it takes for the cycle to happen all over again.

In terms of economic policy, during a war period, the most important priority is to maintain one's access to financial and non-financial resources that are required to sustain a good war effort. Because no country has the capacity to both fund a war and sustain tolerable non-war-related spending out of current income, one must have access to borrowing and/or have very large foreign exchange reserves. The access to borrowing very much depends on each country's creditworthiness and the development of its capital markets, especially the soundness of its own local currency debt market. Similarly, maintaining access to the critical non-financial resources that are required to sustain both the war effort and acceptable domestic economic conditions is essential during the war period.

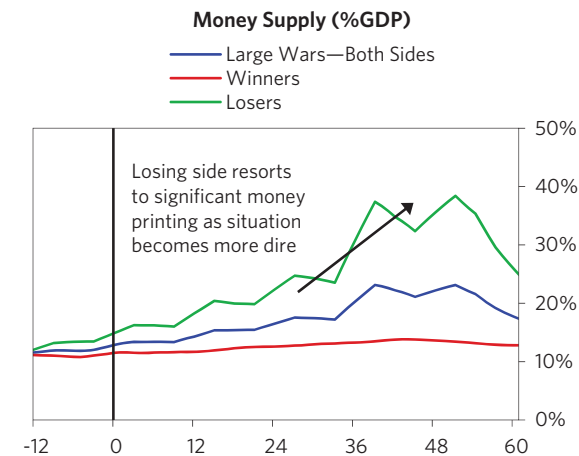
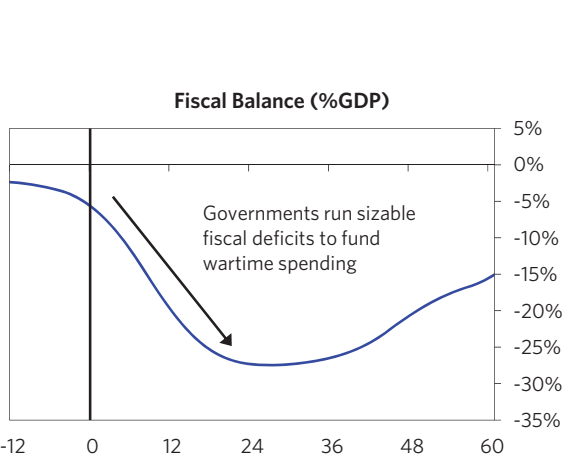
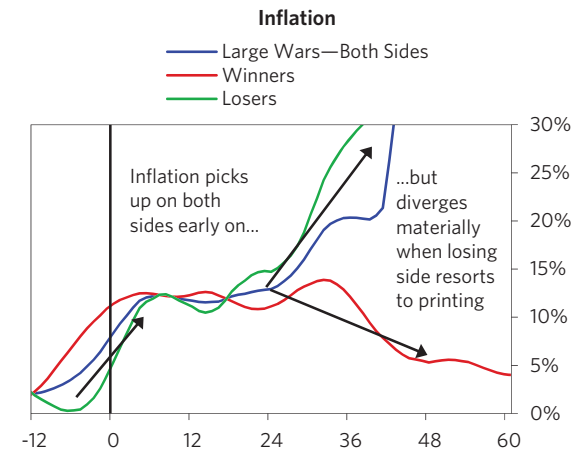
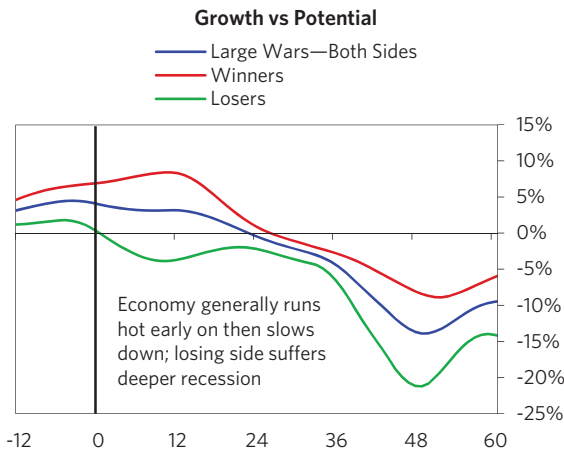
After the war period, during the paying back period, the market consequences of **the debts and the outcome of the war (whether it is won or lost) will be enormous. The worst thing a country, hence a country's leader, could ever do is get into a lot of debt and lose a war because there is nothing more devastating. ABOVE ALL ELSE, DON'T DO THAT. Look at what it meant for Germany after World War I in the 1920s (which is explained in Part 2) and for Germany and Japan after World War II in the late 1940s and the 1950s.**

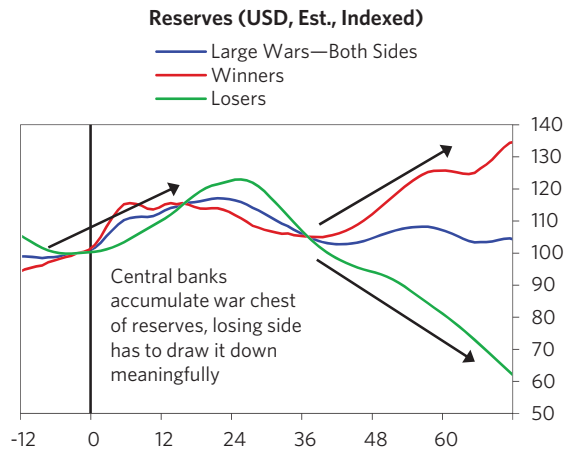
The following charts show some of the typical shifts in the economy—how countries shift much of their economies to war production, borrow a lot of money to finance big fiscal deficits, and move much of their workforces to the armed services and war production. The first chart shows the rapid rise in government spending relative to private spending. The subsequent charts show the increase in military spending and the number of soldiers, averaging a number of war cases—both military spending and number of soldiers as a percent of the population increase by around five times. For instance, during World War II, 20 percent of the US workforce shifted to the military.





After a major war ends, all countries—both the winners and losers—are saddled with debt and the need to transition from a war-economy to a more normal economy. The big contraction of military spending usually causes a postwar recession, as factories are retooled once again and the large number of people formerly employed in the war effort need to find new jobs. Countries typically enter periods of deleveraging, working through the big war debts with the same basic dynamics visible in other depressions/deleveragings coming into play here too. However, losers of war experience significantly worse economic conditions. The following charts demonstrate this dynamic. Losers experience a much deeper depression, resort to more money printing, meaningfully spend down their savings/reserves, and see much higher inflation rates (sometimes experiencing hyperinflation).





That’s all I have to convey about war economies at this stage. For more color on them, I suggest you read the Weimar Germany and US Great Depression case studies in Part 2, as the first paints a good picture of a postwar period for a war loser and the second shows how economic conflicts initiate a sequence of events that lead to shooting wars. I also suggest that you also look at the charts of the US and UK in the post-World War II periods (two examples of winners of wars). The reasons we don’t have charts for Germany, Japan, and other war losers for the post-World War II period is that the consequences for their currencies, other markets, and economies were so devastating that statistics were either ridiculously unreliable or unavailable.

In Summary

I want to reiterate my headline: managing debt crises is all about spreading out the pain of the bad debts, and this can almost always be done well if one’s debts are in one’s own currency. The biggest risks are typically not from the debts themselves, but from the failure of policy makers to do the right things due to a lack of knowledge and/or lack of authority. If a nation’s debts are in a foreign currency, much more difficult choices have to be made to handle the situation well—and, in any case, the consequences will be more painful.

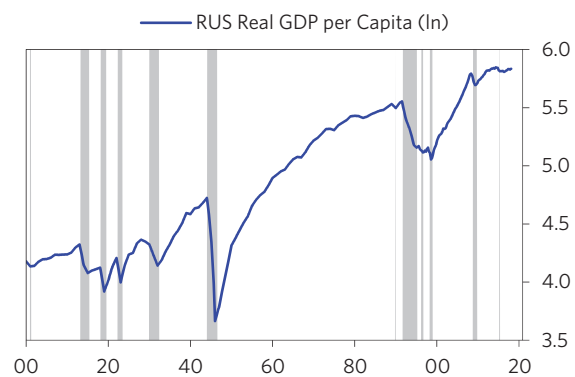
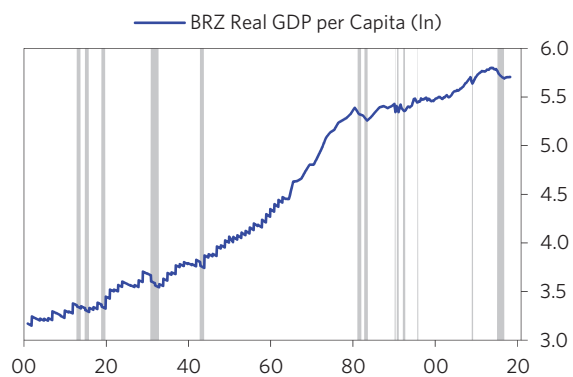
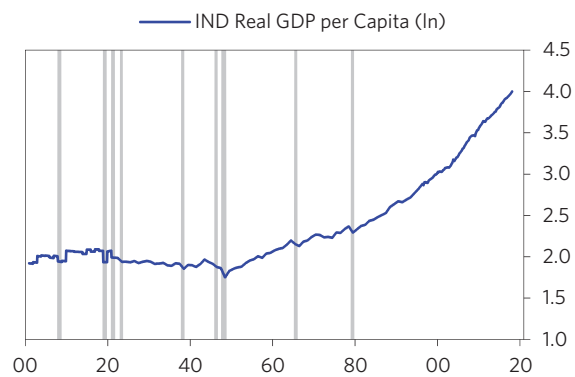
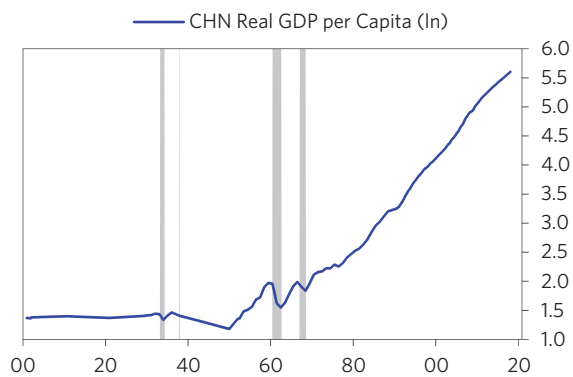
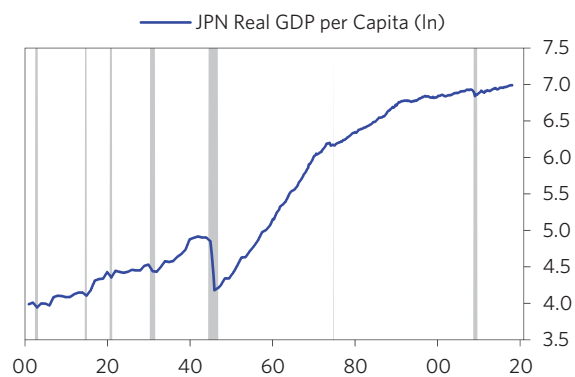
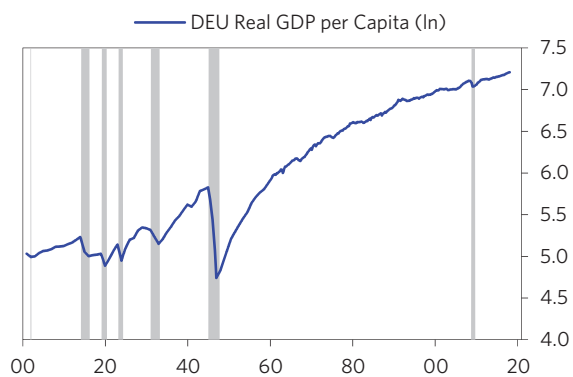
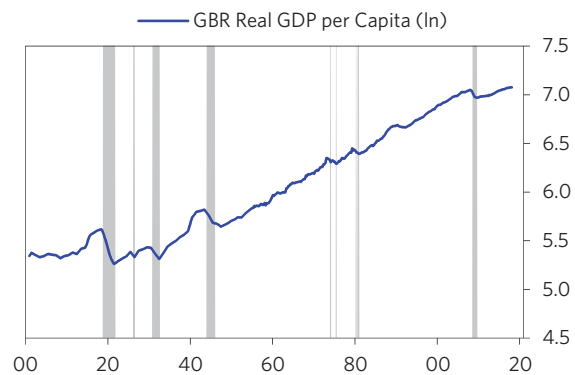
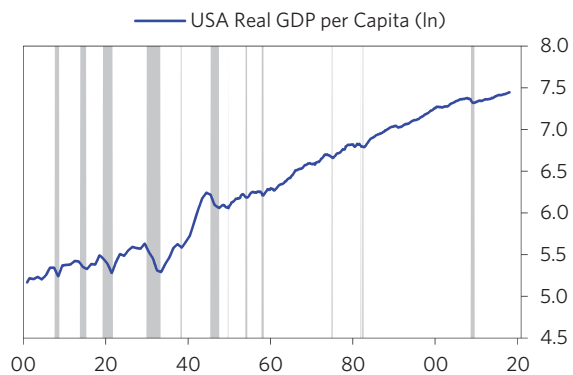
As I know from personal experience, the understandings and authorities of policy makers varies a lot across countries, which can lead to dramatically different outcomes, and they tend not to react forcefully enough until the crisis is extreme. Their authorities vary as a function of how powerful each country’s regulatory and checks-and-balance systems are. In countries where these systems are strong (which brings lots of benefits), there is also the risk that some required policy moves can’t get done because they are inconsistent with the rigid rules and agreements that are in place.

It’s impossible to write the rules well enough to anticipate all the possibilities, and even the most knowledgeable and empowered policy maker is unlikely to manage a crisis perfectly. Circumstances that weren’t foreseen must be responded to instantly, often in hours, within a legal/regulatory system that doesn’t have crystal-clear rules.

The checks and balances system—normally a critical protection from too much concentration of power—can exacerbate a crisis because it can slow decision making and allow those with narrower interests to block necessary policy moves. Policy makers who try to take the necessary bold actions are typically criticized from all sides. Politics is horrendous during debt crises, and distortions and outright misinformation are pervasive.

While these big debt crises can be devastating to some people and countries over the short- to medium-term (meaning three to ten years), in the long run they fade in importance relative to productivity, which is more forceful (though less apparent because it is less volatile). The political consequences (e.g., increases in populism) that result from these crises can be much more consequential than the debt crises themselves. The charts below show real GDP per capita and help to put these big debt crises (and the “little” ones that we call recessions) in perspective. The contractions of more than 3 percent are shown in the shaded areas. Note how the growth rates over time were

far more important than the bumps along the way. The biggest bumps came more as a result of wars than the worst depressions (though a case can be made that those wars were caused by the political fallout from those depressions).



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