

A Template

for Understanding

BIG DEBT CRISES

Ray Dalio

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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.

[* T](#)here 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.

PART 1:

The Archetypal Big Debt Cycle

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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.

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 cyclical nature 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 capitalist-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.

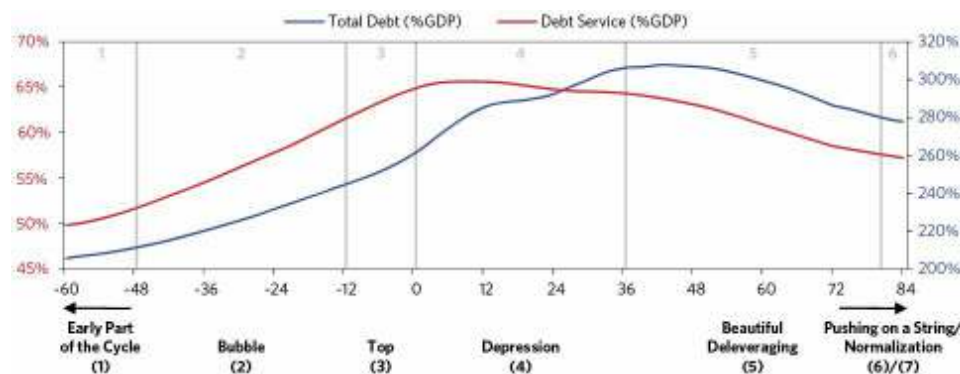
We will begin with deflationary depressions.

1. I'm so debt adverse 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.

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.

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.

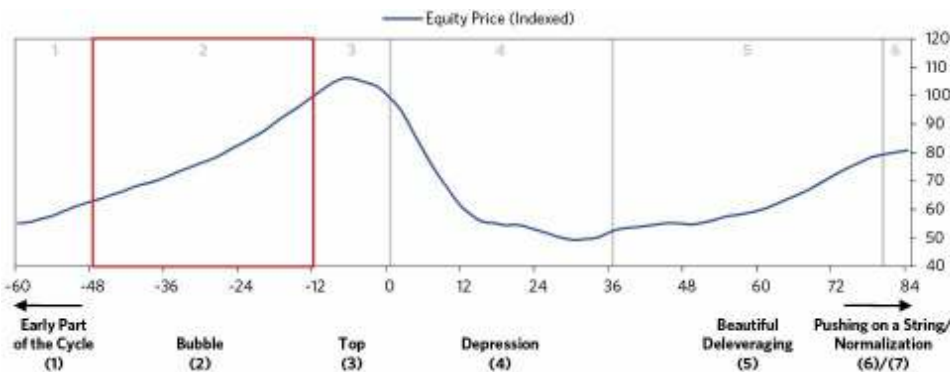
As new speculators and lenders enter the market and confidence increases, credit standards fall. Banks lever up and new types of lending institutions that

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.

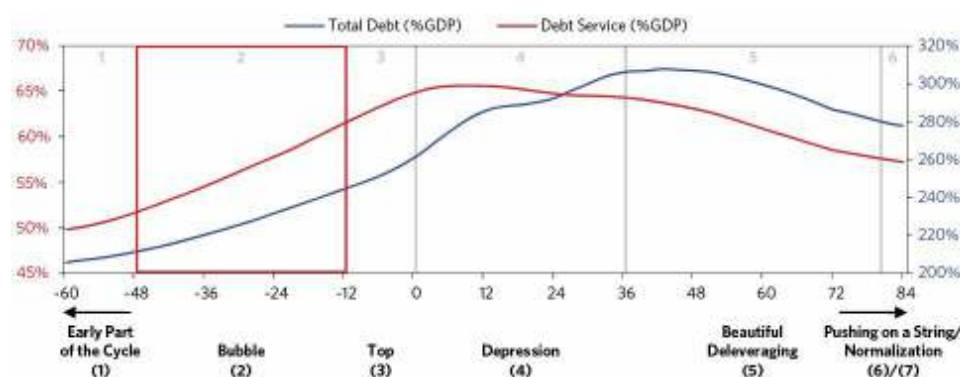
The lenders and the speculators make a lot of fast, easy money, which reinforces the bubble by increasing the speculators' equity, giving them the collateral they need to secure new loans. At the time, most people don't think

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

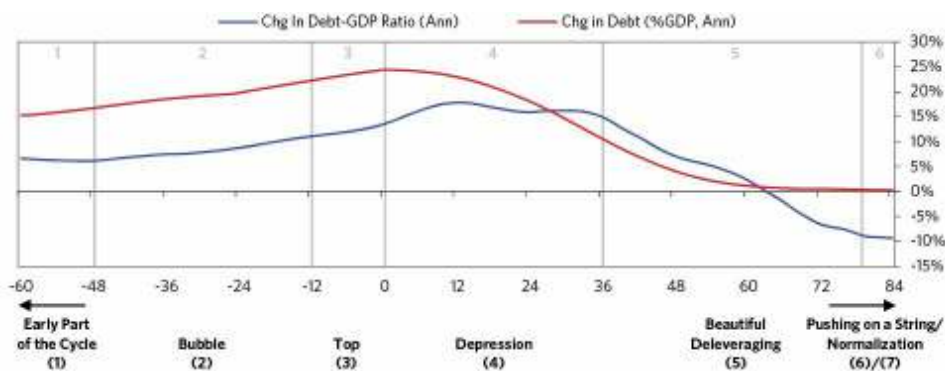
missing out. As a result of this dynamic, all sorts of entities build up long positions. Large asset-liability mismatches increase in the forms of a) borrowing short-term to lend long-term, b) taking on liquid liabilities to invest in illiquid assets, and c) investing in riskier debt or other risky assets 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.



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%

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:

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.

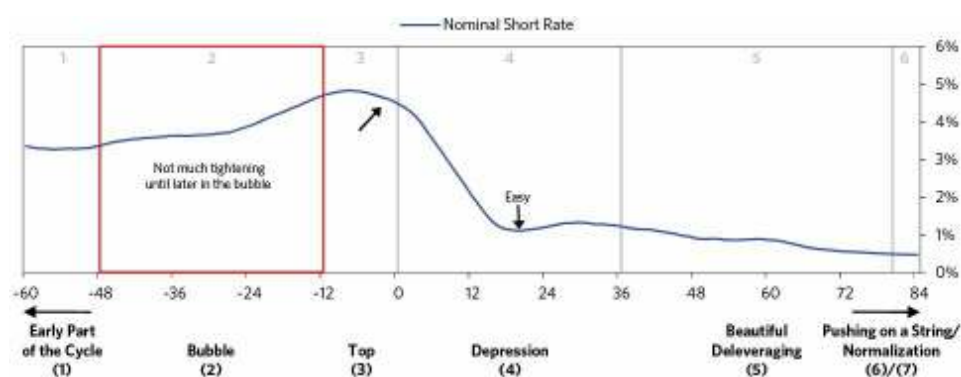
This is one of the biggest problems with most central bank policies—i.e., because central bankers target either inflation or inflation and growth and don't target the management of bubbles, the debt growth that they enable can go to finance the creation of bubbles if inflation and real growth don't appear

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^{h.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.

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)

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.

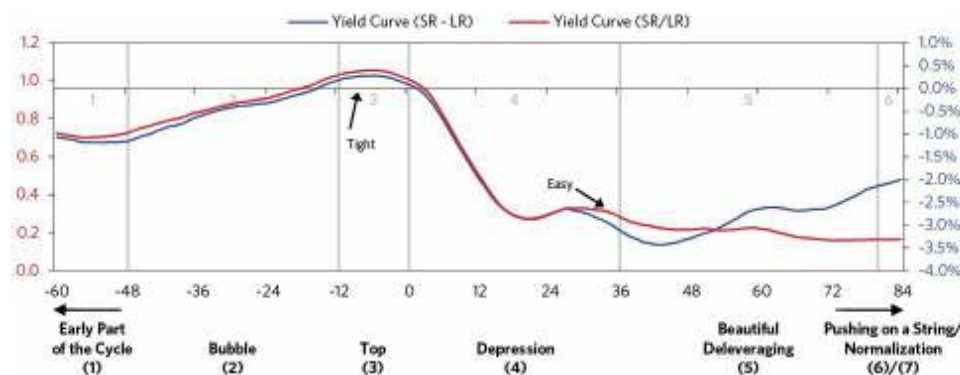
Borrowers are squeezed as an increasing share of their new borrowing goes to pay debt service and/or isn’t rolled over and their spending slows down.

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.

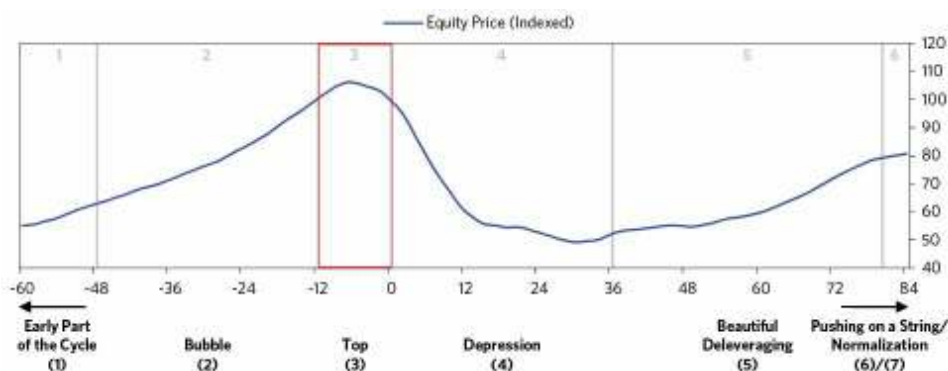
Typically, in the early stages of the top, the rise in short rates narrows or eliminates the spread with long rates (i.e., the extra interest rate earned for



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 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.



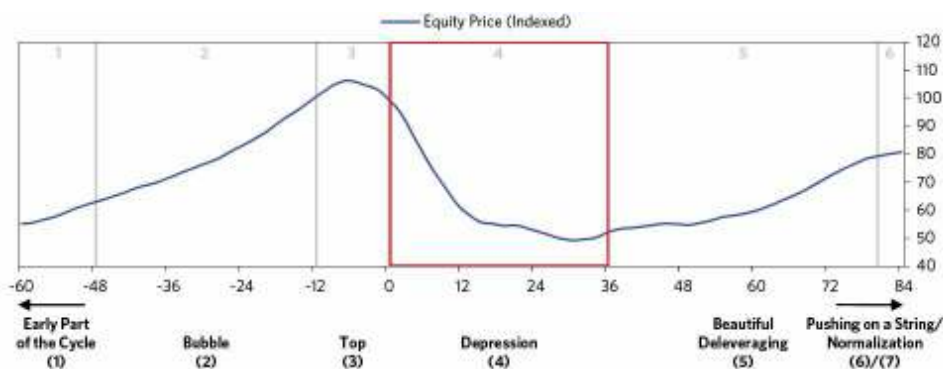
The more leverage that exists and the higher the prices, the less tightening it takes to prick the bubble and the bigger the bust that follows. To understand the magnitude of the downturn that is likely to occur, it is less important to understand the magnitude of the tightening than it is to understand 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