

Part 2:
**The Archetypical Sequence Leading to Central Banks and
Central Governments Going Broke**

I think that all the chapters in Part 2 are very interesting and valuable to skim through by reading what's in bold and then opting into the more embellished non-bolded material as you like.

Chapter 4: The Archetypical Sequence

In examining 65 major debt crises over the last 100 years and in examining more closely the 35 cases in which the central government and/or the central bank went broke, I believe that I have come to understand big debt crises pretty well. What follows is the archetypical process, zooming in to the granular mechanics of what typically happens both leading up to central governments and central banks going broke and after. While I think this section is important because it shows how the template and actual developments have looked in detail, if you don't want to go into all that detail, I suggest you read what is in bold and decide if you want to dive into the greater detail from there. But first, there is one important factor to explain that affects how the cases transpire. That is between cases with hard money versus fiat money.

Hard Money Versus Fiat Money

The cases I am about to describe come in two broad types that typically behave differently in ways that you should understand. The two big types are the hard currency cases and fiat currency cases. In brief, the way the hard currency cases work is that the governments have made promises to deliver money that they can't print (e.g., gold, silver, or another currency that the parties view as relatively hard, like the dollar). Throughout history, in these cases, when coming up with these hard currencies that they couldn't print to pay debts became tough, the governments have almost always reneged on their promises to pay in the currency that they couldn't print, and the value of their money and the debt payments denominated in it tumbled at the moment the promise was broken.

After they their promise but not going back to having a hard currency, they have what is called a fiat monetary system. In these cases, the currency's value is based on the faith and incentives that the central banks provide. The shift of most currencies from being hard to being fiat currencies started on August 15, 1971. I remember it well because I was clerking on the floor of the New York Stock Exchange at the time and was surprised by it; then I studied history and found that the exact same thing happened in April 1933, and I learned how they worked.

In fiat monetary systems, central banks primarily use interest rates, their ability to monetize debt, and the tightness of money to provide the incentives of lender-creditors to lend and hold debt assets. And throughout history they, like central governments and central bankers operating in hard currency regimes, have created too much debt (which are claims that people believe they can turn in to get money, which they expect they can use to buy things), so there are the same type of credit-debt dynamics at work—i.e., the governments create and allow their private sectors to create too much debt to be paid back which leads to printing money to make it easier to pay the debts which devalues money and makes the prices of things go up—except in fiat currency cases the devaluations don't happen all at once at the moment the government breaks its promise to convert the paper money into the hard money storehold of wealth. They happen more gradually.

For example, we have seen this clearly exemplified in the Bank of Japan's policies of aggressively monetizing a lot of debt and keeping real and nominal interest rates extremely low, which has resulted in its currency and the debt denominated in its currency being devalued. Since the start of 2013, the holders of Japanese government bonds have lost 60% versus gold, 45% versus US dollar debt, and 6% in domestic purchasing power (as average inflation was 1%). The devaluation came gradually rather than abruptly because the yen was a fiat currency, but it came for the same reasons it would have come if Japan had a hard currency—i.e., too much debt that needed to be monetized.

In the charts that I will show you throughout this chapter, you will see three lines—the bold one in the middle will show all cases (the hard and the fiat currencies combined) and the two lighter lines will show you what happened on average in just the hard currency cases and what happened on average in just the fiat currency cases. For simplicity, I will explain the dynamic by referring to just the aggregate line.

By the way, the big cycles through history have typically included currency regimes going back and forth between being hard and fiat because they each led to extreme consequences and required movements to the opposite—the hard currency regimes broke down with big devaluations because the governments couldn't maintain debt growth in line with their monetary constraints, and the fiat monetary system broke down because of the loss of faith in the money/debt being a safe storehold of wealth.

Nine Stages of the Final Crisis

In the introduction I summarized the whole archetypical debt cycle. I am now going to focus on the final phase of the Big Debt Cycle, when the central government and the central bank both go broke. This final phase typically transpires in nine steps. While the sequence below is the archetypical one, there are very big variations in what happens and when it happens, and they don't necessarily transpire in the exact sequence I describe. So, the things I am referring to here can be viewed as the unhealthy things that lead to the crisis and the steps that are classically taken to get out of the crisis. The more of these unhealthy things exist, the greater the risk of a "heart attack" where the central government and the central bank go broke. Said differently, there are many reasons a country goes broke—e.g., chronic overspending and debt accumulations; costly wars; costly shocks like droughts, floods, and pandemics; some mix of these things; etc. Whatever the causes, the below checklist adds up to a risk gauge because the more of the unhealthy things that exist, the higher the probability of a debt/currency crisis. Here is the sequence of unhealthy conditions that typifies the last stages of the Big Debt Cycle:

- 1) **The private sector and government get deeply into debt.**
- 2) **The private sector suffers a debt crisis, and the central government gets deeper in debt to help the private sector.**
- 3) **The central government experiences a debt squeeze in which the free-market demand for its debt falls short of the supply of it. That creates a debt problem. At that time there is either a) a shift in monetary and fiscal policy that brings the supply and demand for money and credit back into balance or b) a self-reinforcing net selling of the debt, which creates a severe debt liquidation crisis that runs its course and reduces the size of debt and debt service levels relative to incomes. Big net selling of the debt is the big red flag.**
- 4) **The selling of government debt leads to a simultaneous a) free-market-driven tightening of money and credit, which leads to b) weakening of the economy, c) declining savings/reserves, and d) downward pressure on the currency. Because this tightening is too harmful for the economy, the central bank typically also eases credit and experiences a devaluation of the currency. That stage is easy to see in the market action via interest rates rising, led by long-term (bond) rates rising faster than short rates and the currency weakening simultaneously.**
- 5) **When there is a debt crisis and interest rates can't be lowered (e.g., they hit 0% or long rates limit the decline of short rates), the central bank "prints" (creates) money and buys bonds to try to keep long rates down and to ease credit to make it easier to service debt. It doesn't literally print money. In doing this, it essentially borrows reserves from commercial banks that it pays a very short-term interest rate on, which creates problems for the central bank if this debt selling and interest rate rising continue.**
- 6) **If the selling continues and interest rates continue to rise, the central bank loses money because the interest rate that it has to pay on its liabilities is greater than the interest rate it receives on the debt assets it bought. When that happens, that is notable but not a big red flag until the central bank has a significant negative net worth and is forced to print more money to cover the negative cash flow that it experiences due to less money coming in on its assets than has to go out to service its debt liabilities. That is a big red flag because it signals the central bank's death spiral (i.e., the dynamic in which the rising interest rates cause problems that creditors see that lead them not to hold the debt assets which leads to higher interest rates or the need to print more money which devalues the money which leads to more selling of the debt assets and the currency, and so on). That is what I mean when I say the central bank goes broke. I call this going broke because the central bank can't make its debt service payments, though it doesn't default on its debts because it prints money. When done in large amounts, that devalues the money and creates inflationary recessions or depressions.**
- 7) **Debts are restructured and devalued. When managed in the best possible way, the government controllers of fiscal and monetary policy execute what I call a beautiful deleveraging in which the**

deflationary ways of reducing debt burdens (e.g., through debt restructurings) are balanced with the inflationary ways of reducing debt burdens (e.g., by monetizing them) so that the deleveraging occurs without having unacceptable amounts of either deflation or inflation.

- 8) At such times, extraordinary policies like extraordinary taxes and capital controls are commonly imposed.
- 9) The deleveraging process inevitably reduces the debt burdens and creates the return to equilibrium. One way or another the debt and debt service levels are brought back in line with the incomes that exist to service the debts. Quite often, there are inflationary depressions so the debt is devalued at the end of the cycle, government reserves are raised through asset sales, and a strictly enforced transition from a rapidly declining currency to a relatively stable currency is simultaneously achieved by linking the currency to a hard currency or a hard asset (e.g., gold) by the central bank, and the central government and private sector finances being brought back in line to be sustainable. At the early stage of this phase, it is imperative that the rewards of holding the currency and the debt denominated in it, and the penalties of owing money, are great in order to re-establish the creditability of the money and credit by rewarding the lender-creditors and penalizing the borrower-debtors. In this phase of the cycle there is very tight money and a very high real interest rate, which is very painful and required for a while. If it persists, the supply and demand for money, credit, debt, spending, and savings will inevitably fall back into line. How exactly this happens largely depends on whether the debt is denominated in a currency that the central bank can create and whether the debtors and creditors are primarily domestic so that the central government and the central bank have more flexibility and control over the process. If so, that makes the process less painful, and, if not, it is inevitably much more painful. Also, whether the currency is a widely used reserve currency matters a lot because when it is there will be greater marginal inclinations to buy it and the debt that it is stored in. Having said that, it should be noted that throughout history there has been a strong tendency for governments with such currencies to abuse that privilege by doing more than enough borrowing to lose that privilege, which makes their decline more abrupt and painful.

In the next few chapters I will show you all this happening in charts.

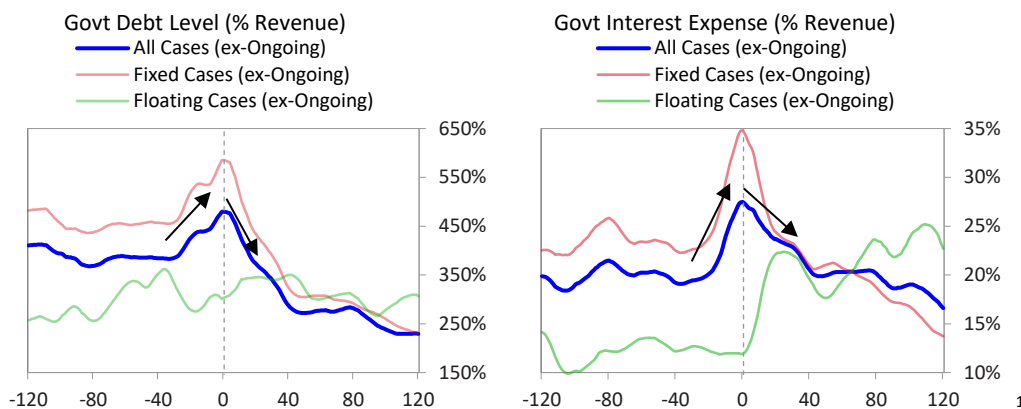
Chapter 5: The Private Sector and Central Government Debt Crisis (Stages 1-4)

In Chapter 4, I laid out the archetypical sequence that you see across crises. Now I go into much more detail on each phase—showing the specific markers and dynamics I saw when I looked at historical cases. I will show this dynamic in charts accompanied by brief explanations. In the charts, the dark blue line shows the average of all cases, the thin red line shows the average of the fixed exchange rate cases, and the thin green line shows the average of fiat-variable exchange rate cases. You will note that the timing and the distinctiveness of these events is clearer in the cases in which exchange rates are fixed (in which case they more cleanly intensify and then break) than in the fiat currency cases (in which the adjustments are more fluid). That is because in fixed rate cases you can see the pressures build up until there is a clear break, whereas in the variable exchange rate cases you will see these changes occur more gradually.

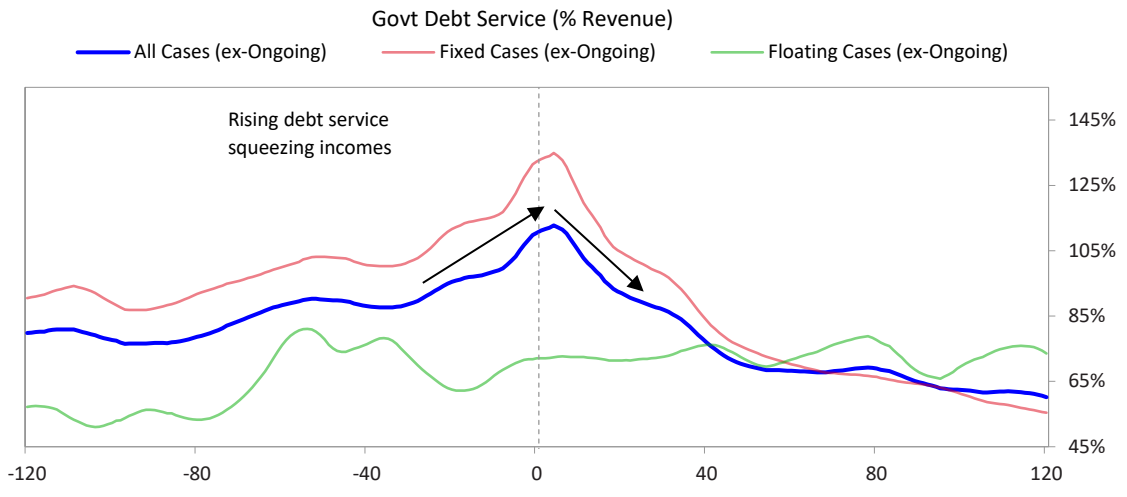
Stage 1: The private sector and government get deep in debt.

We see this in classic ways, such as:

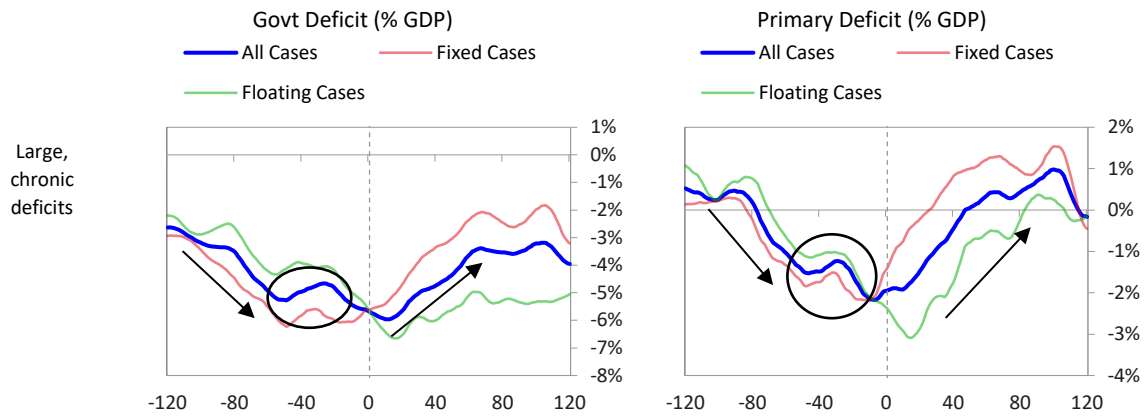
- In the years before the crisis, the government classically has a **large and growing stock of debt** as a result of chronic deficit spending. Typically, one sees a **rising share of spending going to consumption/social safety net and a declining share going to productivity-enhancing investment**, causing debts to increase without a commensurate increase in incomes. Typically, countries become so reliant on a large social safety net that cutting it becomes a political third rail (e.g., in Brazil today, the US today).
- **The level of debt is typically high relative to the government's ability to pay it back with tax revenues and the debt service burden is also high relative to the government's incomes**, starting to crowd out spending on other line items that are considered essential. To cover these costs, more debt needs to be sold than the private sector wants to buy, a source of upward pressure on interest rates (further increasing debt service costs). Note the big differences in what happens in these cases between the floating rate currencies and the fixed rate currencies after the big default/devaluation moment. It reflects the fact that in the fixed exchange rate cases the debt restructuring is more severe and definitive, which sets the stage for a more abrupt and larger rebound. Fiat cases see a gradual increase in debt, as money printing from the central bank allows government spending to continue or even accelerate. Please note that the numbers in the x-axis represent months before and after the peak of the crisis.



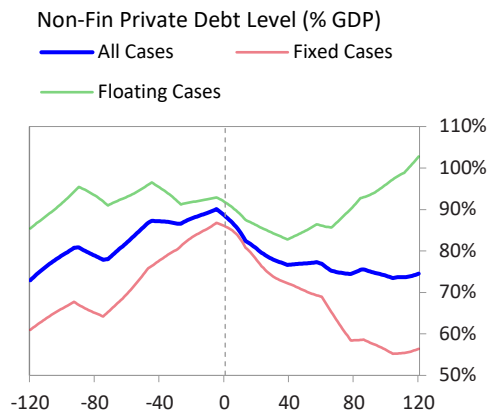
¹ To show a clearer picture of how the government's balance sheet evolves in the upswing and downswing of the cycle, these charts exclude a handful of recent cases (the US, Europe, the UK, and Japan post-financial crisis) that are still playing out.



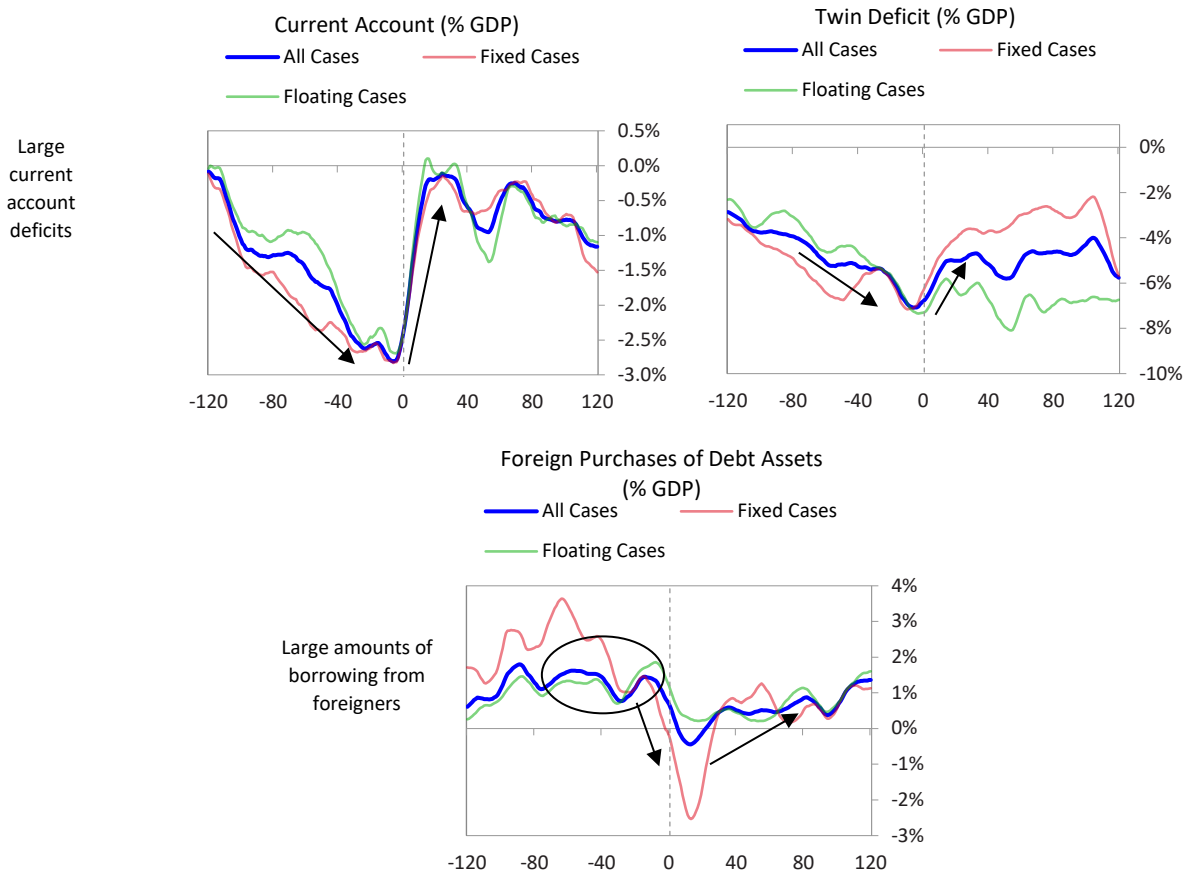
- The charts below show the typical amount of government borrowing (in total and excluding borrowing to cover interest payments) that was done in the years leading up to the devaluation. In 31 of the 35 cases we studied, we saw **large, persistent government deficits** going into the crisis.



- It's worth noting that sometimes the public sector balance sheet looks less problematic on its face. This is true when **there is heavy borrowing in the private sector that the public sector has to back up and when there are implicit public sector guarantees to backstop institutions such as banks that the government can't afford to let fail**. Such cases might as well be public sector balance sheet problems.

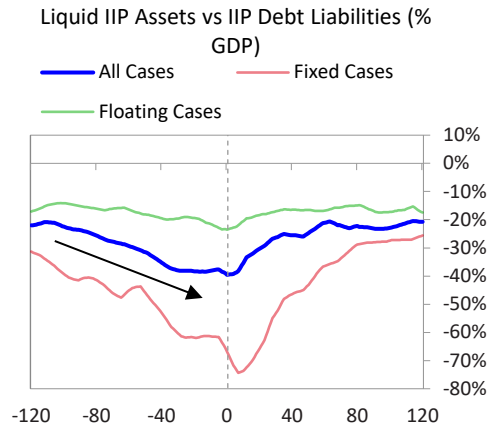
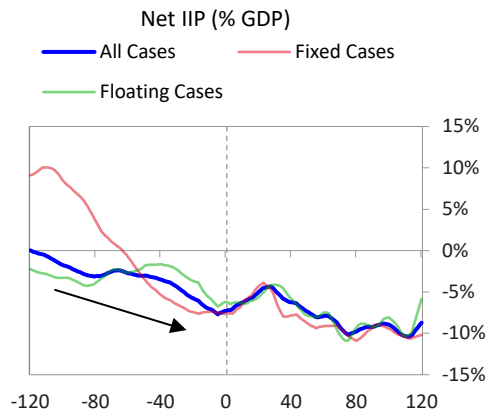


- **The buildup of debts requires large lending from foreigners to finance them.** That lending can be in borrowing the country's currency (which increases the risk of devaluation) or a reserve currency (which increases the risk of default). This increases the country's vulnerability to a pullback in foreign capital. Having said that, having a current account deficit doesn't necessarily signal problems. It reflects capital coming into the country, which could be indicative of the attractiveness of the country's capital markets. However, in circumstances in which the attractiveness of the country's capital markets gets impaired by the need to issue a lot of debt and money quickly to deal with a crisis, the potential for foreign selling of the country's currency and debt represents an added source of vulnerability. As shown in the next set of charts, steadily increasing current account and twin deficits typically lead the crisis by several years. When the crisis occurs, it takes the form of a big devaluation and a constriction of debt-financed demand (including for imports), which has the effect of reducing these deficits.

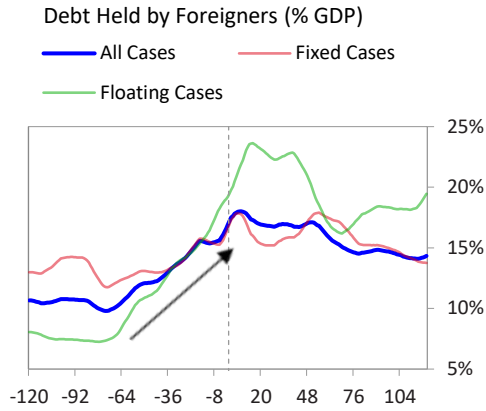


Years of large borrowing from foreigners results in a substantial accumulated debt to foreigners, which increases the country's vulnerability to a pullback in foreign capital. The charts below on the left show the total net international investment position (assets owned abroad minus liabilities owed to the rest of the world) and an adjusted version on the right that measures the amount of liquid assets the country has available relative to the external debts it must service. By the time of the devaluation, the country is typically very low in liquid assets it can use to cover external debt service obligations.

Significant accumulated debts to foreigners



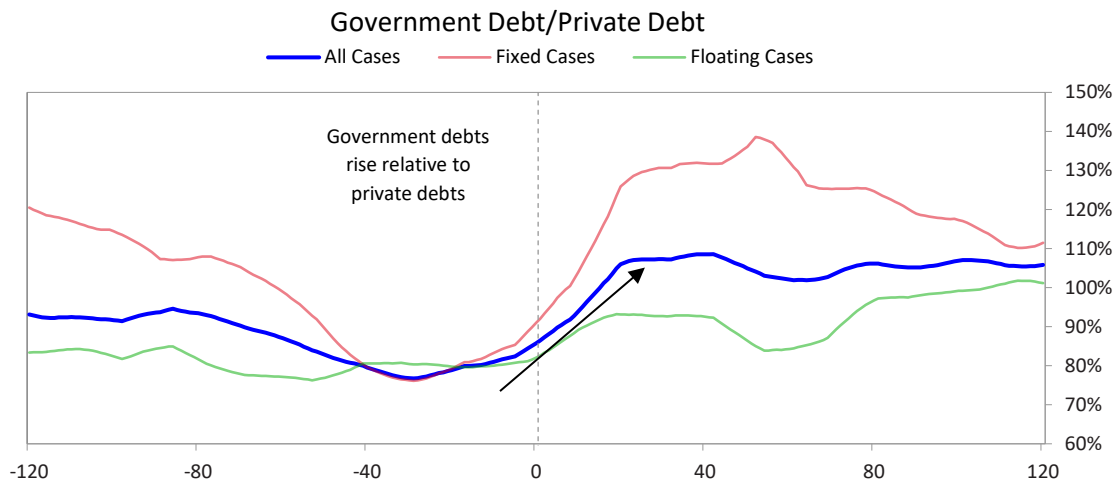
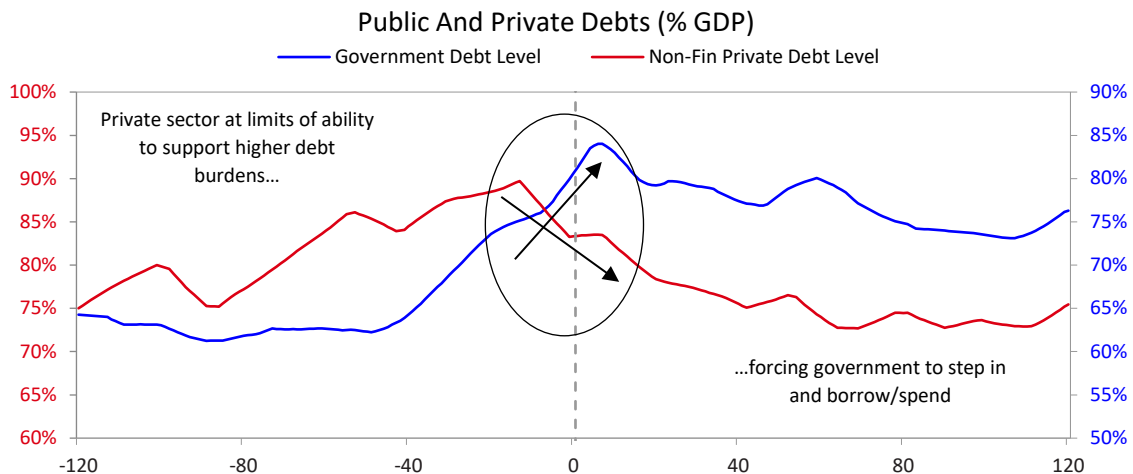
Few liquid assets available to cover external obligations



Stage 2: The private sector suffers a debt crisis, and the central government gets deeper in debt to help the private sector.

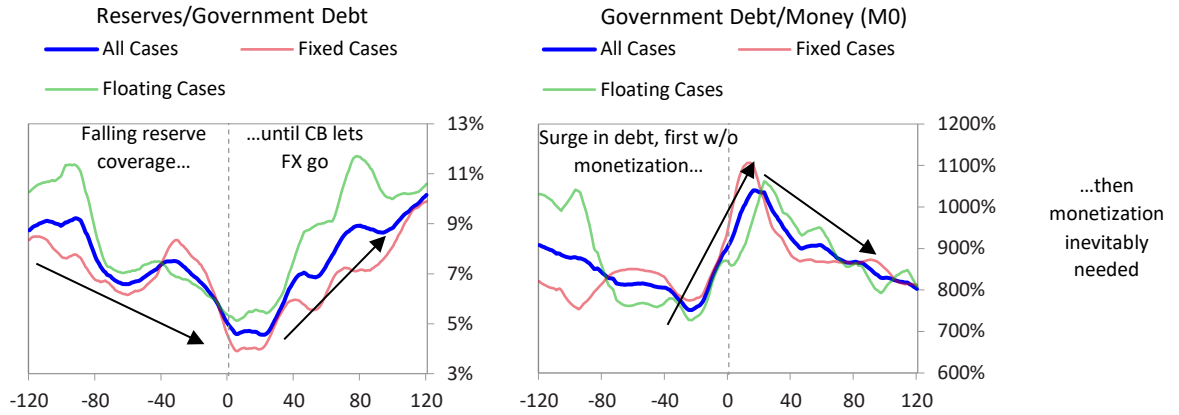
Typically, this occurs at the stage of the cycle when the government’s balance sheet goes from being moderately stretched in the years ahead of the devaluation to extremely stretched when the government is forced to step in to address debt problems that emerge in the private sector. **When the private sector has financial problems, the government typically plays an increased role because it can get money and credit much more easily than the private sector can.** During these difficult times, it is easier for governments to borrow because there is much more willingness to lend to them because everyone knows that their central banks can print money and get it to governments to repay and because governments have the power to tax. Having this greater ability to borrow is especially true for those governments that have the most established reserve currencies because there is high demand to hold that currency/debt.

As a result, when debt conditions deteriorate and governments need to save the day, government debt increases faster than private sector debt. As shown in the charts below, it is typical for the government debt level to soar while the private sector’s debt level plunges about a year before the crisis, and for the government debt levels to rise a lot relative to private debt levels. In 15 of the 21 cases where we had data on both the government and the private sector balance sheet, we saw this pattern happen. When private debt is falling sharply and government debt is rising sharply, it is a short leading indicator of trouble.



At this time, government debt problems tend to intensify. We show a few more measures of this below.

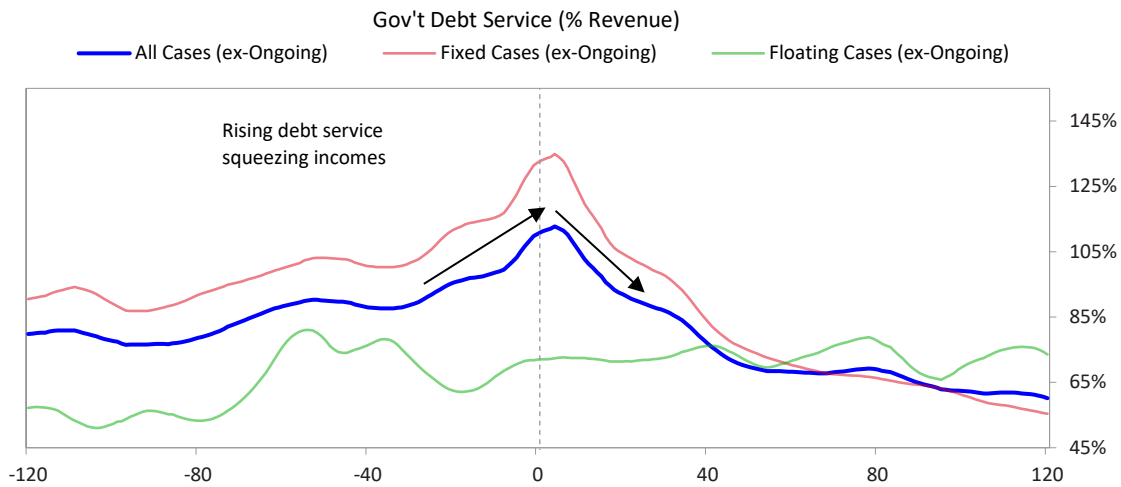
The stock of government debt grows in relation to 1) its revenues, 2) the hard assets it has available to repay its debts (usually in the form of reserves), and 3) the quantity of money in the economy that is available to finance the debt (until the central bank eventually steps in to provide more money and credit to the government).



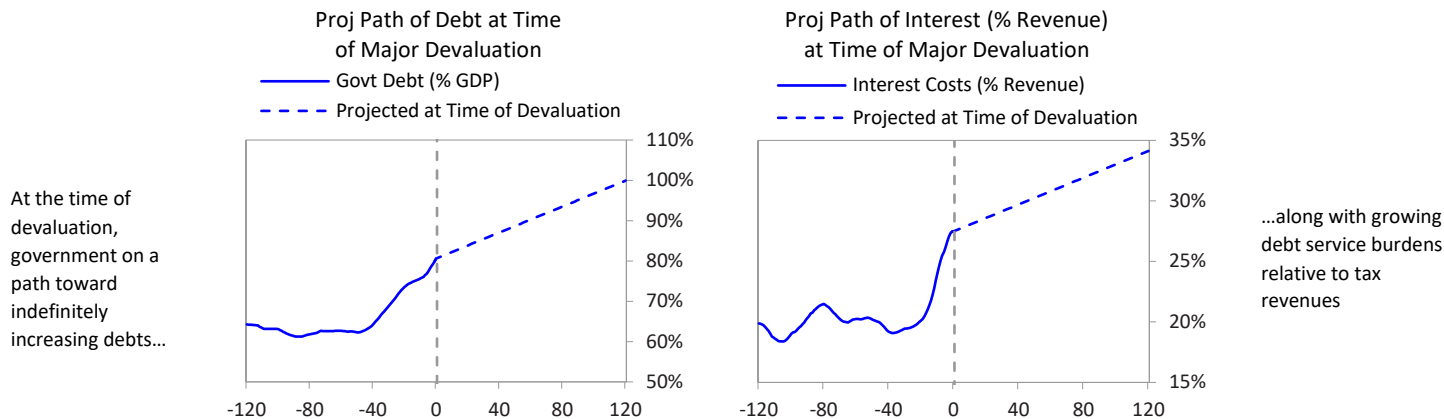
Stage 3: The central government experiences a debt squeeze in which the free-market demand for its debt falls short of the supply of it. That creates a debt problem. If there is net selling of the debt, that creates a much worse problem, so *net selling of the debt is a big red flag*.

The central government gets into financial trouble when 1) its finances are squeezed by debt and debt service expenses that limit its ability to spend on what is essential and 2) the holders of the debt assets created to finance government spending want to sell those assets. This puts upward pressure on interest rates, further increasing the government’s financing costs and requiring either painful spending cuts or even more borrowing to cover those costs.

More specifically, when debt service becomes a very high percentage of income (e.g., 100%), it is a red flag because it means that it is a) squeezing out a lot of spending and/or b) requiring a lot of borrowing and debt rollovers that might not happen because lender-creditors see this situation and worry about it, leading them to not lend or sell their debt assets. There comes a time in the long-term debt cycle when the debt service becomes so large relative to the incomes that it either squeezes out other spending because the borrowing can’t be large enough to allow the avoidance of the squeeze, or because it is so large that it leads to a big demand shortage. In 25 of the 35 cases we studied, we saw government debt service as a percent of government revenues accelerate going into the crisis.



- **Given the debts the government has built up (and the ongoing deficits it is running to compensate for a weak private sector), its debt and debt service burdens are on a path to continue climbing.** The charts below show the average projected path of government debt and interest expense at the time of devaluation across the historical cases. At the time of the eventual devaluation, we can see that the government was typically on a path toward indefinitely increasing debts and debt service absent a devaluation of those debts.



This hasn't happened yet in the US, but it is moving toward happening. As far as Europe, Japan, and China go, government interest service in those places is around half that of the US as a percent of GDP—Europe and China because its government debts are lower (though the debts of other sectors are higher), and Japan because its interest rates have been much lower for a long time. But that can change quickly, especially in Japan where very high government debts (around 215% of GDP) could become a problem if refinanced at higher rates. As we will see later, the very large government debts, Bank of Japan bond purchases, and the BoJ artificially holding interest rates at extremely low levels led to terrible returns for government debt assets because of both the low yields on the debt and the depreciated value of the currency.

Faced with a large and growing debt burden and financing need, a classic next step is the pursuit of measures to paper over issues and **creative ways to source financing, including accounting tricks:**

1. **Use of policy and development banks** to create off-balance-sheet financing (frequently part of the playbook in Asian crises, e.g., Japan and Asian financial crises).
2. Use of **debt guarantees instead of direct spending** (Peru 1980s, Turkey recently). The government will say that it guarantees losses for a certain type of debt, which encourages borrowing—effectively a subsidy. But it doesn't show up in government spending until losses start to appear, so it can misleadingly seem “free” to the government. In 2017, the Turkish government rolled out a loan guarantee program for businesses in the midst of balance of payments pressure.
3. **Requiring or heavily incentivizing domestic players, especially banks, pensions, and insurers, to finance the government** (Turkey recently, Brazil recently). Sometimes this takes the form of extremely beneficial regulatory treatment of government debt (making a risky instrument seem risk-free), and sometimes manipulation of yield curve and financing rates to make it attractive (US during World War II), which is effectively backdoor monetary financing (because it incentivizes banks to lever up at short-term interest rates to lend to the government).
4. **Patriotic campaigns to get people to fund the government** (Turkey recently appealing for people to sell their dollars for lira, World War II appeals for people to buy government bonds, Korea 1990s relatively successfully creating a campaign asking people to use their gold to pay back the IMF).
5. **“Paying” for increased spending with future cuts and tax increases that might never come** (Brazil recently, creating a constitutional amendment to limit spending, but creating plenty of outs when needed).
6. **Calling in favors from international creditors** and/or making geopolitical deals for financing (Turkey recently, UK setting up Sterling Area after World War II).

7. **Shortening maturities of debt**, since usually borrowers are more willing to lend for short periods than long (described further below).
8. **Capital controls** to keep money from leaving the country are common in relatively severe situations.

Stage 4: The selling of the government’s debt leads to a) a free-market-driven tightening of money and credit which leads to b) a weakening of the economy, c) downward pressure on the currency, and d) declining reserves as the central bank attempts to defend the currency. Because this tightening is too harmful for the economy, the central bank eventually simultaneously eases credit and allows a devaluation of the currency.

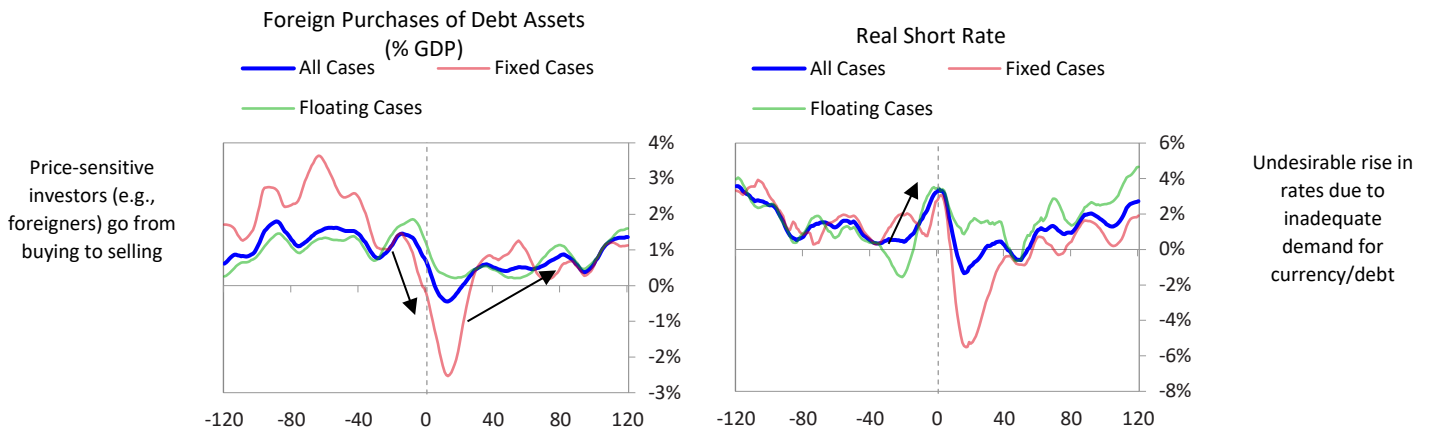
These events typically accelerate investors’ and savers’ flight from the country’s assets, bringing the run on the currency and the debt to a breaking point. Typically, the central bank attempts to defend the currency with monetary tightening and reserve sales but is ultimately forced to change course due to the painful economic effects of tightening and the inadequacy of its reserves.

A relatively large red flag for me is when debts rise relative to the incomes that are necessary to service them to such an extent that smart investors recognize losses are inevitable (i.e., because there must be either a default or a lot of printing of money, currency weakness, and inflation to depreciate the debts in order to avoid a default).

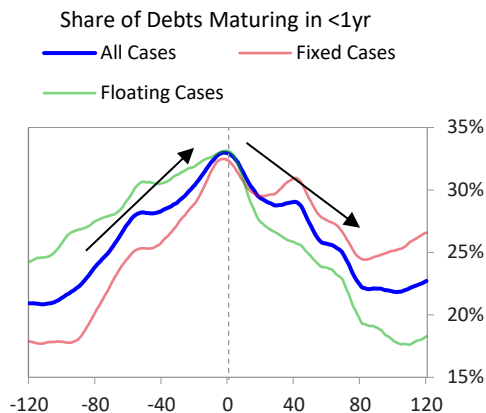
When the lender-creditor loses faith that they will be adequately paid (because the debtors won’t be able to afford to pay debt service or because the amount of debt service isn’t sufficient—e.g., won’t adequately compensate the lender-creditor for inflation), there will be inadequate buying relative to the selling of debt so the price of debt will have to go down (so the interest rate will have to go up) until there is either less borrowing or more saving.

During times of risks of war or actual war this is worsened because risks of sanctions (i.e., confiscating debt assets), excessive borrowing, debt default, and devaluation increase. Wars or not, that is when the doom loop can kick in—i.e., when the upward pressure on interest rates weakens the economy and increases the government’s future borrowing needs (or requires big tax increases or spending cuts that would be excessively painful at this juncture) which then creates an even bigger supply/demand mismatch in the bond market and puts even more upward pressure on interest rates. That is when central banks have to come in to save the day by “printing money” and buying the debt and we have what we call quantitative easing (QE).

As you will see in the charts below, in these times there is a simultaneous plunge in foreign inflows to buy local bonds, government and corporate (left chart), and a spike in real rates as there is a classic failed attempt to support the currency via rising interest rates and tightening credit.



In these periods, we often see the government shorten the maturity of its issuance in order to make the bonds more palatable to the market.



When market participants see that these limitations are being reached there is selling, which worsens the supply/demand balance. When that becomes large the central bank is faced with the choice of a) allowing interest rates to rise to a level that will curtail borrowing and lead to greater desire to lend to the government by redirecting money and credit that would have gone to other things (e.g., the purchase of other investments), or b) printing money and buying the debt to make up for the demand shortfall. History shows and logic dictates that it will always choose b) over a), and that the best path is to balance a) and b). When that produces enough selling so that inflation rises when the economy is weak, the central bank is damned if it does print money and buy a lot of debt because it contributes to terrible currency weakness and inflation, and it's damned if it doesn't because it causes extremely tight money, extremely high interest rates, and a very bad economy.

That happens when the debt service squeeze becomes intolerable for the borrower-debtor and/or the lender-creditor doesn't want to hold the debt (typically because it is not providing a high enough real return, the risk of default is perceived as high, and/or the risk of the central bank printing a lot of money thus devaluing it is high). When those things happen a doom loop downward spiral in the value of the government debt occurs until a new equilibrium level is reached when the debt is sufficiently destroyed or devalued so that the debt burdens are no longer excessive.

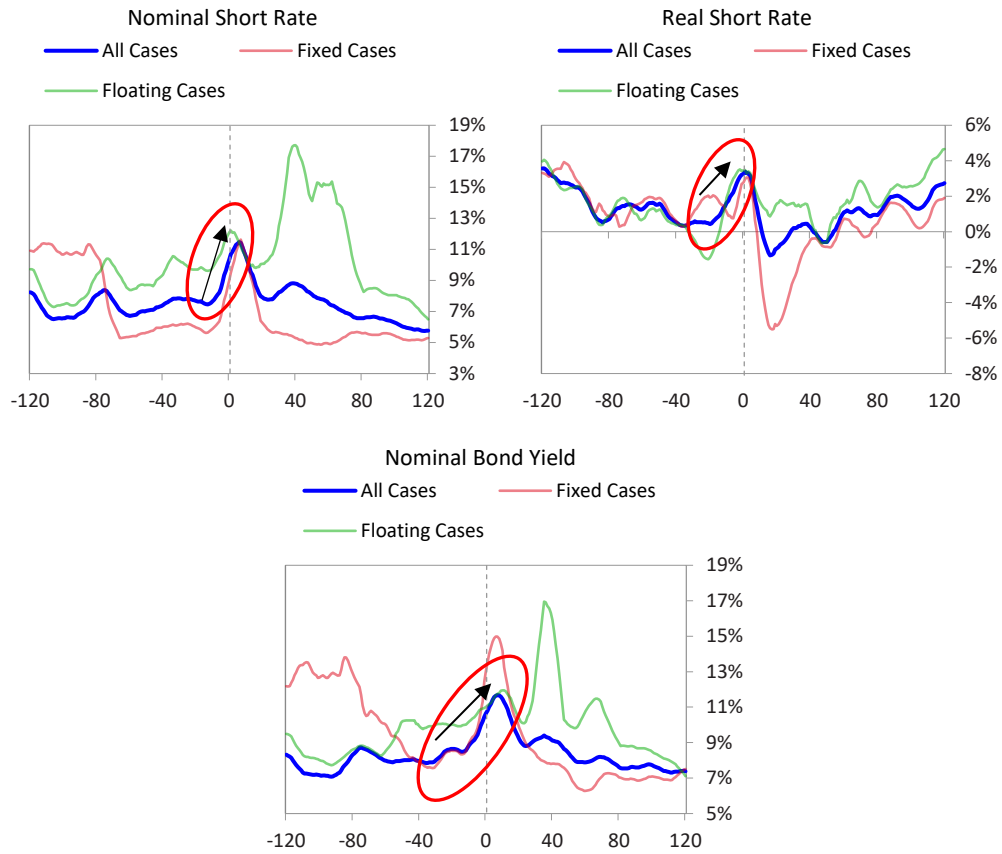
This hasn't yet happened in the US, Europe, Japan, or China.

Below, we walk through these dynamics in more detail.

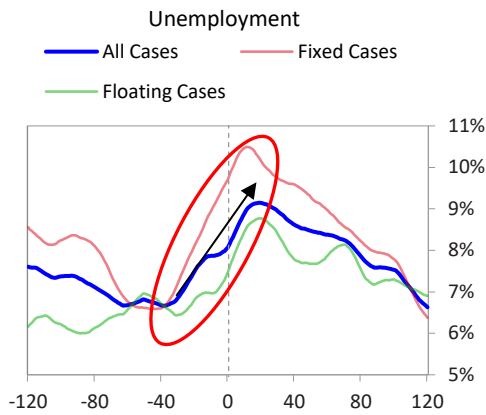
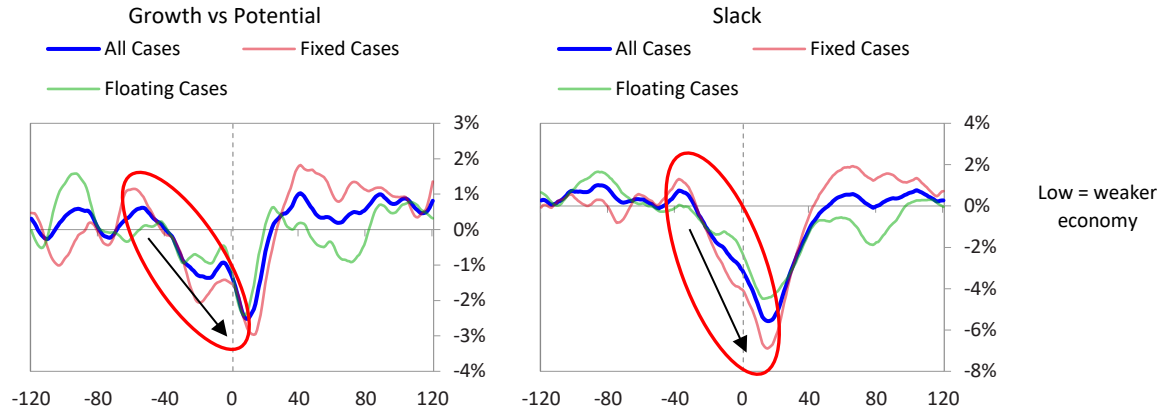
- **There is a tightening and/or currency intervention to defend the currency, but the tightening is abandoned because it's too harmful for the economy and the currency intervention is abandoned because it doesn't work and is too costly, so the currency/debt devalues.**

This situation becomes untenable when investors and savers see what's going on and make the logical decision to abandon the country's assets and currency because there is a high risk that in one way or another they won't get their buying power back. This brings the crisis to a head because it puts more pressure on the central bank to tighten at a time when doing so would likely produce unacceptably bad economic outcomes. **A few of the red flags of this more advanced stage are:**

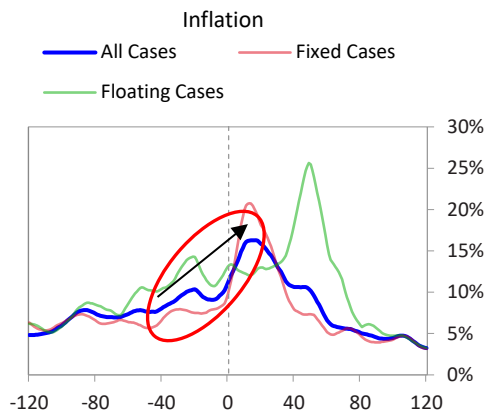
- **Interest rates rise because there is selling of the country's debt assets and because the central bank typically attempts to tighten to defend the currency.** In the face of such depressed conditions, such an increase in real interest rates is unsustainable as it puts too much pressure on an economy that is already weak and on a government that is facing a debt spiral absent lower interest rates.



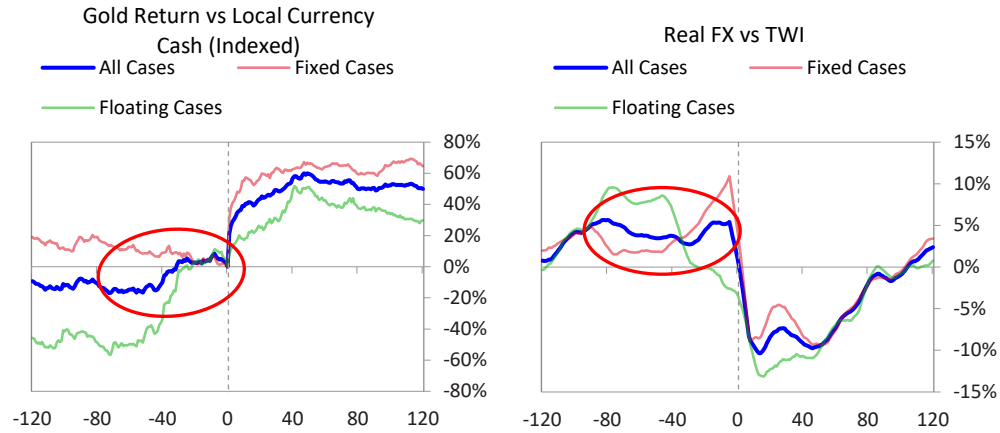
- **The tightening worsens a weak economy** (which ultimately requires the tightening to be abandoned and the devaluation to occur).



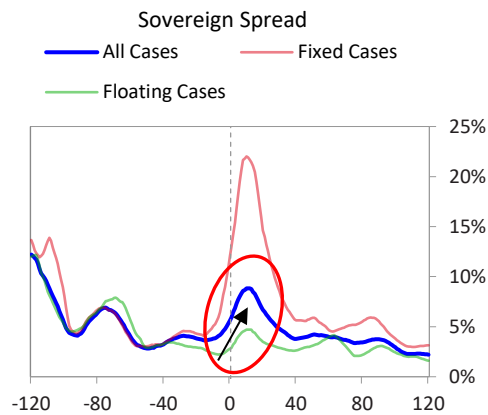
- While not always the case, **inflation tends to rise and become higher than desirable** going into the crisis (constraining the central bank's ability to ease without risking undesirable high inflation).



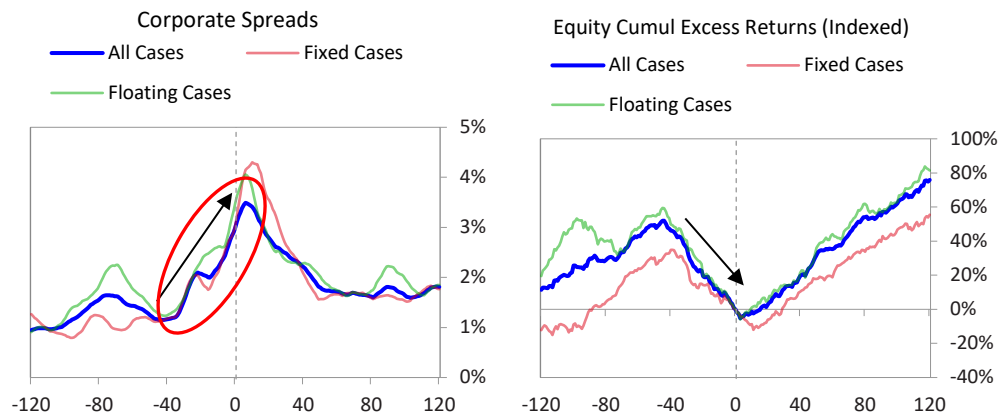
- Due to the weak economy and the rising inflation, there is substantial pressure for the currency to fall. At this stage, there is a big divergence between the floating rate and fixed rate cases. The policy makers in fixed rate cases are fighting against currency depreciation. In fact, with high inflation the currency is getting more expensive right when they need a devaluation. In the floating rate cases, the currency is gradually selling off into the economic weakness.



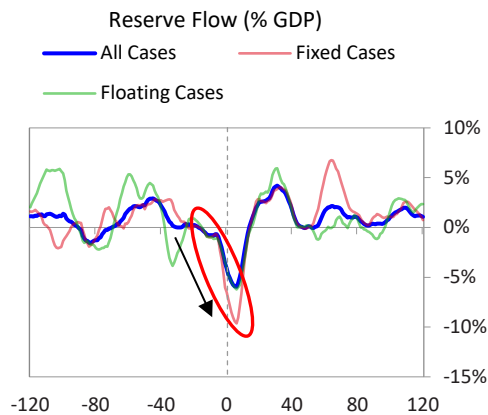
- For countries with hard currency debts, **credit spreads rise** as markets price in a greater likelihood of default.



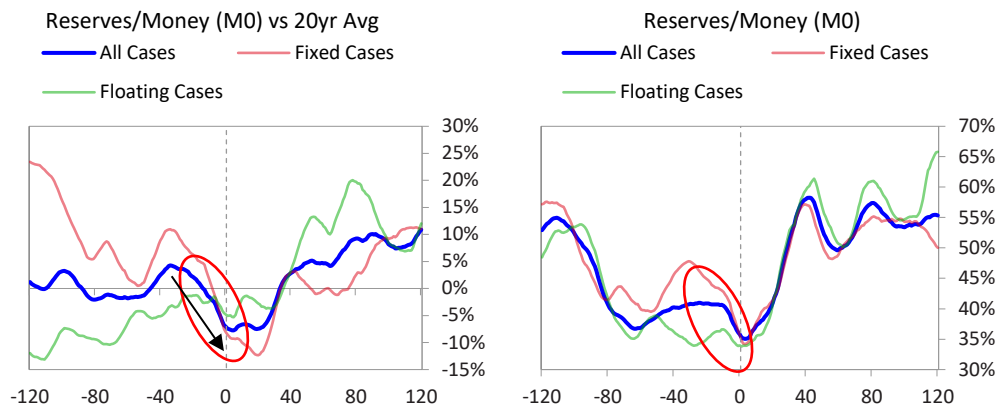
- **Risky assets price in higher risk premiums** (i.e., sell off), adding to the downward pressure on the economy.



- **At this stage, the central bank typically sells reserves.** Remember that debt works for governments pretty much the same way it works for people and companies except that governments that have the debt denominated in their own currency and have the ability to print their own currency can print the money to pay off their debt. Also, as for people and companies, governments can build up savings to help them prevent financial problems when their incomes fall short of their expenses. For that reason, when looking at the riskiness of any debtor, including governments, one should also see what amount of liquid savings they have. Reserves are one of the main forms of liquid savings for governments. So are sovereign wealth funds. Watching their size, how fast they are being drawn down, and how close they are to running out is important to identifying the timing of debt problems. In the process, it pays to watch for the selling of foreign currency and buying of local currency, which is typically done. Because this reduces the money supply, it is a form of tightening. As shown in the chart below, the selling of reserves is typical at this stage of the cycle.



- **Note that in the most severe cases, reserves are typically already low relative to the central bank's liabilities (e.g., the stock of money that savers hold), which gives these central banks little firepower to fight the run on the currency. When that is the case, it becomes apparent that their currency defense will fail, which increases the betting against the currency and the fleeing of debt denominated in it.**



The table below shows in more detail past interventions of central banks via their reserves across all the cases with meaningful intervention. What you can see is that:

- **Typically, before the central bank intervenes by selling reserves, the country has a modest war chest of reserves (on average around 5% of GDP covering 10% of the outstanding money supply and government debt outstanding).**
- **To stem capital flight, during the intervention phase the central bank typically spends over half of its reserves in total to defend the currency (reserves in global currency terms have fallen by 62% on average).**

Typically, a lot of this selling is concentrated in a relatively short period of time—for example, in the worst six-month period of intervention reserves decline by 49% in the median case.

- **Typically, the currency falls** during the currency defense phase (gold rallies 42% in the median case)—though in some cases the central bank’s intervention is able to temporarily prop up the currency.
- **Then, after a roughly two-year defense (though it of course varies by case)—the central bank gives up.** At this point the reserves back only a small amount of the money stock (6% on average) and a tiny amount of the government debt (3% on average). **After the central bank stops intervening, the currency falls further (and on average gold has rallied another 51% in the median case).** The different cases are shown below.

Before the central bank intervenes by selling reserves, the country has a modest war chest of reserves (in the typical case, around 5% of GDP, covering around a tenth of the money supply and government debt outstanding.

To stem capital flight and currency weakness, during the intervention phase, the central bank typically spends over half of its reserves in total to defend the currency. Typically, a lot of this selling is concentrated in a relatively short period of time—for example, in the worst six-month period of intervention reserves decline by 49% in the median case. Then the central bank stops spending reserves on trying to hold the currency up because it sees that it will fail at that and the prospect of having no reserves is scarier than the prospect of the currency falling.

The currency generally falls during the currency defense phase (gold rallies by 42% in the median case)—though in some cases the central bank's intervention is able to temporarily prop up the currency.

After a roughly two-year defense (though it of course varies by case)—the central bank gives up. At this point, the reserves back only about 6% of the money stock and 3% of the government debt. After the central bank stops intervening, the currency sells off (gold rallies another 51% in the median case).

Summary of Central Bank Intervention via Selling Reserves Across Cases with Meaningful Intervention

Case	Fixed vs Floating	Starting Firepower				Length of FX Defense (in Months)	Intervention Phase				Gold vs Local FX Excess Return During Intervention Phase	Post-Intervention Phase				Gold vs Local FX Excess Return Until FX Bottoms
		Reserve Levels Pre-Intervention					Peak 6-Month Intervention % GDP	Total Reserve Spend to Defend FX % GDP	% Initial Reserve Level	Reserve Levels Post-Intervention						
		%GDP	USD, Bln	% Money Stock (M2)	% Govt Debt					% of Reserves at Start of 6m Period		% GDP	USD, Bln	% Money Stock (M2)	% Govt Debt	
Median (All Cases)		5.1%	6.44	10%	11%	23	-2.6%	-49%	-3.3%	-62%	42%	1.9%	1.66	6%	3%	51%
Fixed		6.1%	4.98	10%	13%	19	-2.7%	-48%	-3.3%	-65%	42%	2.0%	1.66	6%	2%	41%
Floating		4.4%	9.03	14%	11%	29	-1.9%	-57%	-3.8%	-58%	36%	1.7%	1.65	5%	3%	66%
ARG: 1990s Hyperinflation	Fixed	1.3%	5.16	--	3%	6	-2.6%	-50%	-2.6%	-50%	330%	2.0%	2.56	--	2%	--
ARG: 2001 Peg Break	Fixed	8.7%	26.85	43%	25%	19	-6.8%	-47%	-14.1%	-65%	107%	7.9%	9.42	27%	6%	--
BRZ: 1999 Peg Break	Fixed	8.5%	73.62	34%	21%	11	-5.2%	-49%	-6.7%	-56%	52%	5.2%	32.72	21%	10%	--
DEU: Post-World War II	Fixed	0.8%	0.25	2%	0%	64	-0.2%	-46%	-0.6%	-90%	107%	0.1%	0.02	0%	0%	--
FRA: World War II	Fixed	30.9%	2.96	26%	29%	92	-8.2%	-48%	-7.0%	-84%	192%	1.1%	0.48	2%	2%	133%
GBR: Great Depression	Fixed	6.1%	1.34	10%	4%	15	-2.7%	-36%	-3.3%	-43%	40%	5.2%	0.77	7%	3%	3%
GBR: Post-World War II Deval	Fixed	6.2%	2.66	7%	3%	36	-1.0%	-21%	-2.4%	-38%	54%	4.7%	1.66	6%	2%	5%
GBR: World War II	Fixed	14.7%	4.07	22%	11%	37	-3.7%	-66%	-12.8%	-89%	19%	1.5%	0.44	2%	1%	--
JPN: Great Depression	Fixed	4.0%	0.49	9%	15%	26	-3.0%	-55%	-5.1%	-67%	35%	2.7%	0.16	6%	6%	56%
JPN: World War II	Fixed	5.1%	0.37	10%	13%	38	-2.5%	-58%	-2.4%	-81%	10%	0.6%	0.07	1%	1%	>500%
MEX: 1982 Default	Fixed	1.6%	4.98	7%	5%	12	-1.8%	-57%	-2.7%	-65%	227%	1.7%	1.76	9%	3%	23%
MEX: Tequila Crisis	Fixed	3.9%	20.89	18%	25%	11	-3.2%	<-100%	-6.4%	-128%	42%	-1.7%	-5.75	-9%	-7%	28%
TUR 2001 Hyperinflation	Fixed	6.1%	18.44	26%	19%	5	-3.3%	-44%	-4.4%	-50%	27%	4.4%	9.24	19%	14%	16%
USA: 1971 Devaluation	Fixed	1.8%	18.61	3%	3%	23	-0.2%	-14%	-0.4%	-23%	-6%	1.2%	14.42	2%	2%	150%
USA: Great Depression	Fixed	6.6%	5.15	9%	15%	14	-1.0%	-15%	-1.3%	-18%	-1%	6.1%	4.25	9%	12%	55%
ARG: 2020 Default	Floating	5.9%	36.47	18%	11%	68	-5.0%	<-100%	-12.6%	-135%	163%	-3.2%	-12.93	-11%	-4%	43%
BRZ: 1980s	Floating	2.5%	7.13	18%	5%	6	-1.9%	-55%	-1.9%	-55%	42%	1.4%	3.18	10%	3%	-42%
BRZ: 2002 BoP Crisis	Floating	6.9%	34.88	31%	11%	20	-5.5%	<-100%	-9.5%	-159%	10%	-3.5%	-20.63	-16%	-6%	--
BRZ: 2014 BoP Crisis	Floating	15.9%	37.127	44%	28%	33	-2.9%	-18%	-7.1%	-31%	16%	16.2%	255.62	44%	25%	10%
DEU: Weimar Hyperinflation	Floating	6.6%	0.59	7%	5%	63	-1.6%	-39%	-4.8%	-73%	>500%	1.9%	0.12	4%	2%	--
FRA: Early 20s Deval	Floating	4.0%	1.15	7%	4%	77	-0.7%	-19%	-2.8%	-28%	48%	6.3%	0.83	6%	3%	133%
GBR: Late 70s Devaluation	Floating	4.7%	10.94	11%	11%	25	-1.0%	-29%	-1.9%	-43%	-4%	2.4%	6.21	7%	6%	110%
ITA: Late 70s Devaluation	Floating	2.9%	6.67	4%	7%	15	-0.8%	-28%	-0.7%	-21%	-26%	2.4%	5.25	3%	5%	94%
TUR 1994 BoP Crisis	Floating	2.6%	6.44	22%	11%	4	-1.9%	-60%	-2.1%	-62%	31%	1.4%	2.47	14%	5%	47%
TUR 2018 BoP Crisis	Floating	3.8%	30.34	8%	14%	41	-6.5%	<-100%	-10.2%	-293%	108%	-6.8%	-58.67	-15%	-30%	84%

Gold excess return figures are dashed out for cases where the currency bottomed before reserve intervention stopped. We show "<-100%" in cases where the central bank spent more than their entire war chest of reserves (for instance via using a swapline to borrow additional reserves).

At this stage, it becomes relatively clear that the currency is at best highly risky and at worst a very bad deal. This leads to not just investors leaving the debt/currency, but in many cases participants in the economy—most importantly banks, corporations, and households—making prudent/de-risking moves out of the debt and currency. Here are many of the dynamics we saw in the cases we studied which I consider classic signs of being in the late stages of the debt cycle:

Corporate Treasury Actions

1. **Domestic companies decide to keep international revenue offshore principally in foreign FX** (i.e., dollars), not converting them back to local currency like they used to. Seeing their revenues swing in local currency terms even as dollar prices stay more stable, they begin to think of their local currency as the currency to hedge, even though in traditional investing they should hedge the foreign currencies.
2. **Domestic corporations decide to increase their amount of hedging of the local currency**, especially those with hard currency debts. Hedging involves a forward contract to sell the local currency and buy foreign currency, which lowers the forward exchange rate and drags down the spot exchange rate.
3. Similarly, **foreign corporations with domestic subsidiaries ensure cash is promptly swept out of the country.**
4. **Companies decide their foreign subsidiaries aren't worth the hassle**—navigating the currency risk, political chaos, sometimes career risk, for a small expansion opportunity doesn't make a lot of sense. New FDI projects are put on hold.

Domestic Bank Actions

5. **The banks that were forced to buy the debts under government policies have to sell them when liquidity dries up**—accelerating the debt sell-off in the worst of the crisis.
6. **Some of the central bank tactics to keep conditions stimulative (multiple interest rates, capital controls) make it more attractive to keep money offshore than onshore.** Domestic banks and corporations are often the ones best placed to make that market. Even if kept in the same currency, money leaving the domestic banking system often means selling government debt.

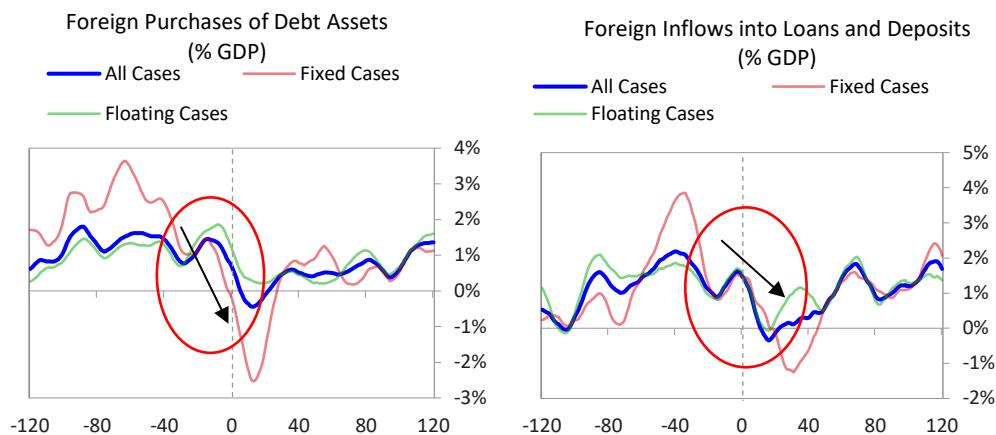
International Bank Actions

7. **International lenders close lines of business that are too much of a headache**—trade financing, working capital lines of credit, etc.
8. **Often, they literally sell or give away their bank subsidiaries when it is not worth the exposure to losses** that a small subsidiary has on the broader corporation (let alone the headache of paying attention to this corner of the business).

Large International Investor Actions

9. Ironically, even as borrowing grows, more of it is held by players who can't sell (e.g., banks), and the dollar value of the assets fall. **Liquidity dries up, pushing out large foreign investors who don't like illiquid assets.**
10. **There are moves out of the currency by large government reserve holders, often with geopolitical considerations** a big part of the decision.
11. Often, big international reserve allocators can't really sell their assets—it would be too disruptive to the market. Instead, **reserve managers start accumulating all new reserves in a different currency**—causing demand to dry up.
12. Relatedly, international investors can't sell their assets (too little liquidity), but **they don't roll the exposures.**

The outflows from foreigners are classic and tend to lead the devaluation.



Domestic Saver Actions

13. **Domestic savers decide they want diversification, and to some degree begin betting on inflation-hedge assets, which drives flows in that direction. They convert bank deposits to hard currency, requiring banks to sell local currency to buy foreign currency.**
14. **People buy real goods to get ahead of inflation.** Since a share of these real goods are imports, it creates a currency sale. This of course also fuels inflation and makes matters worse.
15. **High-net-worth individuals, mostly concerned about wealth preservation and rising taxes and wealth confiscation, move money abroad.**
16. **Domestic savers see holding foreign stocks as the more reliable bet.** More products pop up to make that possible.
17. **Opening foreign bank accounts, since domestic banks look troubled, looks like the prudent move.** Those banks make it easy to exchange to other currencies (assuming the government hasn't imposed capital controls; in many cases the government makes opening foreign bank accounts quite difficult).

More Traditional Speculative Trading

18. **Bond vigilante market action emerges and becomes self-reinforcing.**
19. **Equity investors pull out of the country as the environment deteriorates, which creates a negative currency impact.**

Chapter 6: The Crisis Spills over to the Central Bank (Stages 5-6)

This chapter continues to go through the dynamics I laid out in my archetype of a big debt crisis. Here we will focus on Stages 5-6, when problems spill over to the central bank.

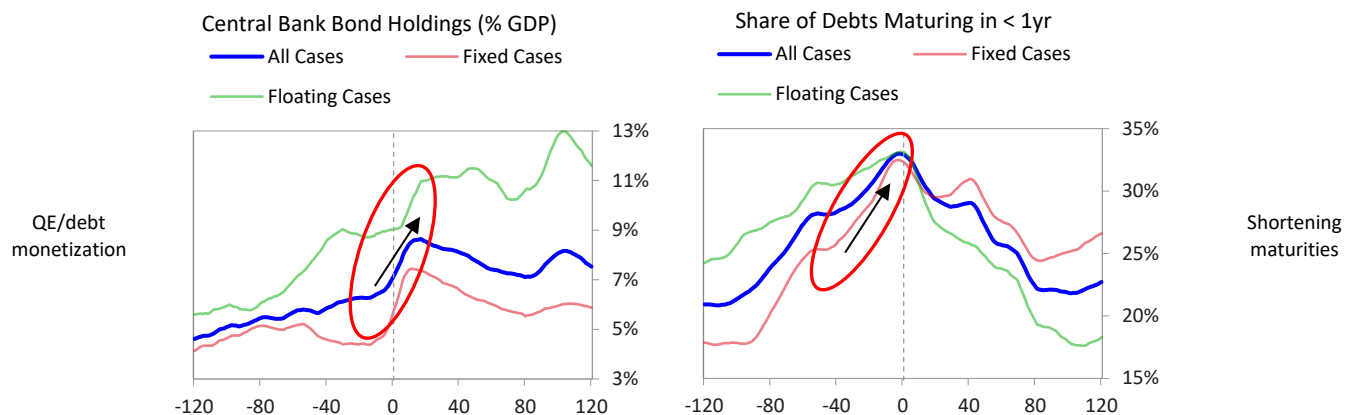
Stage 5: When there is a debt crisis and interest rates can't be lowered (e.g., they hit 0%), the central bank "prints" (creates) money and buys bonds to ease credit and make it easier to service debt. It doesn't literally "print money." In doing this, it essentially borrows reserves from commercial banks that it pays a very short-term interest rate on.

Ultimately, the government can't escape that it needs to find much more financing for its spending priorities. But at this stage, it typically experiences financing rates higher than it can afford—often because of mechanical selling of the currency and debt. At this stage, needing financing the government turns to the central bank. This puts the problem in the central bank's court.

History shows that during such time central banks typically produce a lot of money and credit to buy the bonds. I view this as a red flag, but not yet a big red flag because of the power of central banks to control the production of money and credit. In the case of central governments and their debts, it will be difficult to avoid the squeeze if the deficits continue because the high debt burdens cause increasing amounts of government spending to be directed to debt service. We will get into an examination of the US government's finances later.

More specifically, the central bank steps in to relieve the pressure on the government's finances (or the finances of other systemically important entities) either through the direct purchase of assets or indirectly through guarantees and backstops. The central bank often takes losses on these assets if they were bought at uneconomical prices in the form of default, inflation, and/or rising interest rates. At this stage, the balance sheet hit is transferred from the government to the central bank and the holders of the currency.

As previously explained, when there isn't enough demand for government debt, the central bank will be faced with the choice between either a) having interest rates rise enough to bring supply and demand into balance, which will reduce both the demand for credit and spending, or b) printing money and buying debt assets, which will expand the central bank's balance sheet via quantitative easing, which means acquiring a lot of debt assets. If these things continue for a long time they should be viewed as early-stage red flags. Also, when governments shorten the maturities of their debt, which typically happens when there isn't enough demand for their long-term debt, that should be viewed as an early-stage red flag, too. And, when both a) the total debt and b) the government debt that is held by the central bank rises because there isn't enough free-market demand to buy the debt, that should be viewed as an early-stage red flag, as well. As shown in both charts below, these trends toward greater central bank holdings of bonds and shortening of maturities typically start nearly a decade before the crisis and reverse after it. Notice the acceleration of central bank bond buying and how the maturity of the government debt is rapidly shortening.



As mentioned earlier, when the system is working well, the demand to borrow from borrower-debtors and the willingness to lend by lender-creditors balance. However, when the free-market demand for the debt that is being sold is not adequate, the central government and the central bank take on more of the debt when the private sector can't. The government can do this when the private sector can't because lender-creditors will more readily lend to the government during times of stress because they believe that the central government will pay it back because it is the central bank that has the power to print money behind it so there is virtually no risk that it will default. **The risk becomes that the central bank will produce too much money and credit in order to prevent defaults, which will produce a lot of inflation that will make being paid back in devalued money a big risk for the lender-creditor. When this happens, I view it as a red flag, but not a big red flag because history shows that it can happen a lot before the supply and demand imbalance becomes a problem.** This started in 2008. It was previously called debt monetization and has this time around been called quantitative easing. In the United States, it came in four waves that added up to 18% of potential GDP, 5% of total debt, and 16% of government debt. In Europe, it also came in four waves that added up to 30% of potential GDP, 10% of total debt, and 36% of government debt. In Japan, it came in three waves that added up to 95% of potential GDP, 22% of total debt, and 46% of government debt.

When central banks buy bonds, they take on the same set of risks that commercial banks and investors take on when they buy bonds. The only difference is that central banks have the powers to print money to monetize them and to account for their losses in ways that make them less apparent.

More specifically, when the central bank buys the bond (say, from a bank), it pays for it by telling the bank it has a new deposit at the central bank. The central bank pays interest on that deposit (not that different from money you or I keep at a bank). Just like commercial banks can get into trouble if the interest they earn on their assets is below the interest they pay on deposits, it's the same for central banks. If the interest rates the central bank pays on deposits rise above the interest that they are getting on the bonds they own, they will lose money and will have a negative cash flow. If they used mark-to-market accounting, they would have losses on the bonds, and as with banks and investors, if their losses become greater than their capital they have a negative net worth. In reality, at this stage no one cares much, but for reasons that I will explain, they should.

Stage 6: If interest rates rise, the central bank loses money because the interest rate that it has to pay on its liabilities is greater than the interest rate it receives on the debt assets it bought. When that happens, that is notable but not a big red flag until the central bank has a significant negative net worth and is forced to print more money to cover the negative cash flow that it experiences due to less money coming in on its assets than has to go out to service its debt liabilities. That is a big red flag because it signals the central bank's death spiral (i.e., the dynamic in which the rising interest rates cause problems that creditors see that lead them not to hold the debt assets, which leads to higher interest rates or the need to print more money which devalues the money which leads to more selling of the debt assets and the currency, and so on). That is what I mean when I say the central bank goes broke. I call this going broke because the central bank can't make its debt service payments, though it doesn't default on its debts because it prints money. When done in large amounts, that devalues the money and creates inflationary recessions or depressions.

At this stage, the central bank typically ends up in a difficult situation, caught between the need to maintain policy that is at once easy enough to support a weak economy and a fiscally weak government but also tight enough to discourage savers and investors from fleeing the currency. This is a classic hallmark of an unsustainable situation, and it typically manifests in the following ways:

a) Central banks have losses and negative net worths.

After the central bank has bought a lot of debt and interest rates have risen so debt prices have fallen and the central bank's short-term costs of funds are greater than the returns on the debt they bought, central banks have big losses that are so big that they lead the central banks to have negative net worths. That is another red flag. Still, all these red flags don't signal the end of the Big Debt Cycle—they just show signs of the fading financial health of the system. It is not the end because central banks can still print plenty of money to provide ample money and credit and to fund their losses. Having said that, it is noteworthy that in some cases where the governments don't want to have flimflam finances, the central government is required to put capital in the central bank to recapitalize

it. When that happens, the central government has to get more capital to provide it, which will require it to get it by taxing, cutting spending, and/or borrowing which adds to the squeeze.

When central banks buy a lot of debt, that lowers the value of the debt because it lowers the value of the money that the debt asset is promised to get. And when the short-term interest rates that they have to pay are high relative to the long-term interest that they get from the debt assets that they own, they have losses and can have a negative net worth. This is a moderate red flag at first—several central banks have negative net equity (or equivalent) today, and it doesn't hinder them much in the way of their operations. But at larger degrees of losses, it could begin a spiral that creates much bigger problems.

The advantage of the central banks doing such buying is that 1) it provides credit that wouldn't have existed to keep interest lower than they would have been and 2) when interest rates rise and the bonds have losses, it will be the central bank that has the losses. This raises the question of whether or not central bank losses matter, and if so why. The answer is that central banks having losses certainly matters less than private sector investors having losses and having to appear to lender-creditors as creditworthy. **When central banks have big losses on their debt that signifies a step toward a more advanced stage near the end of the Big Debt Cycle, so I view it as a mid-cycle flag.** There is typically still no reason for a crisis at this stage because, as stated, small or moderate losses don't matter much for the central bank. However, as these losses move from being small to being very large, they can create cash flow needs for the central bank that can only be met with a lot of money printing, which puts a significant downward pressure on the currency, as the central bank runs up a large interest bill on its liabilities (in an effort to keep savers in the currency) but earns little on its assets (in an effort to support the government) and ends up printing the difference. The table below describes historical cases where these cash flow losses became very large and necessitated a big monetization that contributed to a currency spiral:

Historical Cases Where Central Banks Took Large Cash Flow Losses

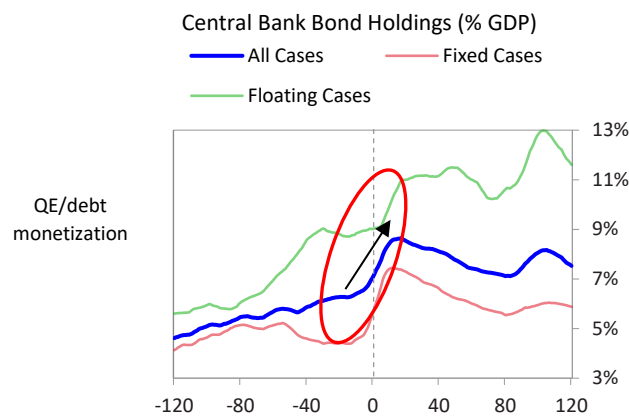
Case	Start Date	End Date	Average Over Period			Losses Paid By	Propensity To Spend Printed Money	Outcomes Of Case		
			CB Balance Sheet (% GDP)	CB Cash Flow Losses (% GDP)	CB Net Reserves (% GDP)			Money Growth (Ann.)	Inflation (Ann.)	Cumulative FX Move
ARG (Late 80s)	Jan-88	Dec-90	31.5%	-3.3%	4.7%	Money Printing	High	107%	4927%	-97%
ARG (Recent)	Jan-19	Dec-22	34.0%	-3.5%	1.4%	Money Printing	High	50%	49%	-86%
PER (Late 80s)	Jan-85	Dec-88	6.9%	-2.6%	2.5%	Money Printing	High	214%	246%	-100%
Dutch Guilder	1780	1796	5.8%	-3.3%	1.8%	Money Printing	High	27%	22%	-80%
Turkey (Today)	Jan-23	Early 2024	17.2%	-2.6%	-2.5%	Money Printing	High	20%	84%	-42%

<p>Large losses on smaller balance sheets (huge liability costs vs low asset yields)</p>	<p>Losses monetized through printing rather than recapitalization by government</p>	<p>Printed money left the currency as savers had been burned before and were still facing low real rates</p>	<p>Losses were a contributor to massive currency devaluations</p>
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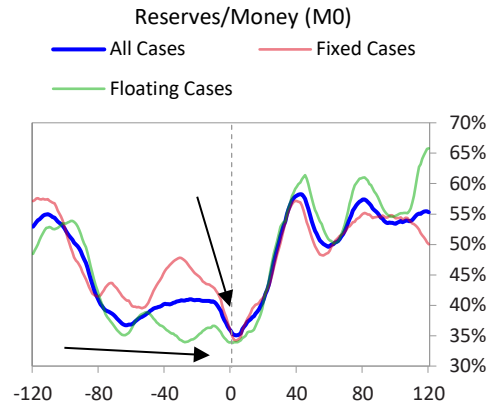
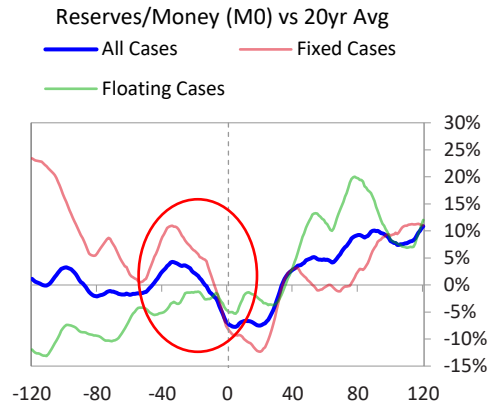
b) The central bank is forced to print money to monetize losses on its debt and other debts even though it worsens pressure on the currency.

Faced with these circumstances, the central bank is ultimately forced to print money to monetize its losses and the losses of others. This can happen explicitly through the direct purchase of assets by the central bank or indirectly through guarantees and backstops. The central bank typically takes losses on these assets (often bought at uneconomical prices) through defaults, inflation, and/or rising interest rates—transferring the balance sheet hit from the government to the central bank and the holders of the currency. **Some of the hallmarks of this stage are:**

- **An expanding central bank balance sheet** as money is printed to finance the government or to roll the debts of other stressed entities. The left chart below shows the central bank's purchases of government bonds, but it's worth noting that central bank actions can be much broader than this (up to and including the purchase of private assets like corporate bonds or equities). They can also include measures to guarantee and backstop stressed borrowers that don't always show up on the balance sheet but still represent some transfer of purchasing power to stressed debtors as the central bank and government are on the hook for covering losses (e.g., Emergency Banking Act of 1933, Bank of Amsterdam's backstop of the Dutch East India Company—both of which ultimately required monetization).



- **The sale of reserves** as the central bank tries to defend the currency while simultaneously providing money and credit to those that need it. The result is that the composition of the central bank's asset holdings shifts from hard assets (gold and FX reserves) to soft assets (claims on the government or financials). This contributes to the run on the currency (particularly when the currency is pegged) as investors see the central bank's resources to defend the currency rapidly decreasing, forcing the central bank to sell reserves even faster until it reaches the point where a defense is no longer feasible. This dynamic is far more pronounced in the fixed rate cases.
- **The monetization of debts combined with the sale of reserves causes the ratio of the central bank's hard assets (reserves) to its liabilities (money) to decline, weakening the central bank's ability to defend the currency.** This is another case where having a fixed versus a floating rate case is important. Pegged countries tend to have a more backed money supply but run into problems sooner when the ratio of reserves to money declines. They also tend to expend more reserves in the currency defense stage of the cycle.



In fixed rate cases, the level of hard assets tends to be higher (closer to 50% backed on average), but begins to decline and is only around a third backed at the time of devaluation

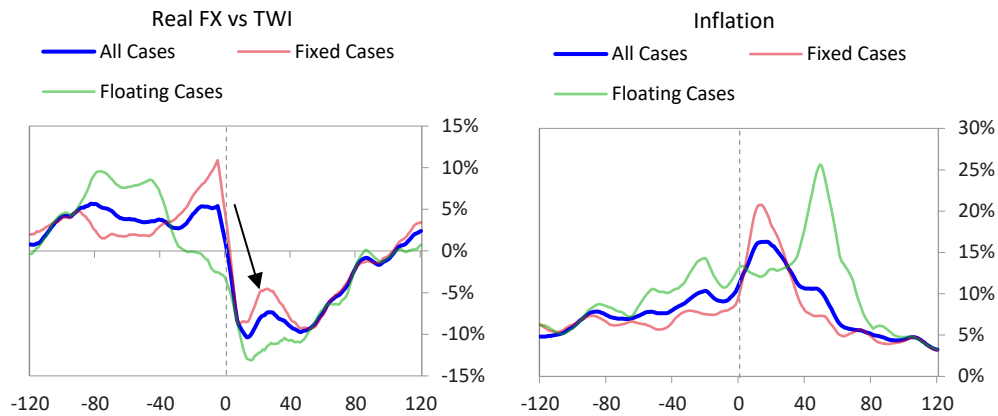
Chapter 7: The Prior Big Debt Crisis Recedes, a New Equilibrium Is Reached, and a New Cycle Can Begin (Stages 7-9)

The cycle ends when a mix of market forces and policy-maker actions create a bottom and an upswing from there. This chapter lays out the dynamics and markers I look for in these times (Stages 7-9 of the archetype I showed in Chapter 4).

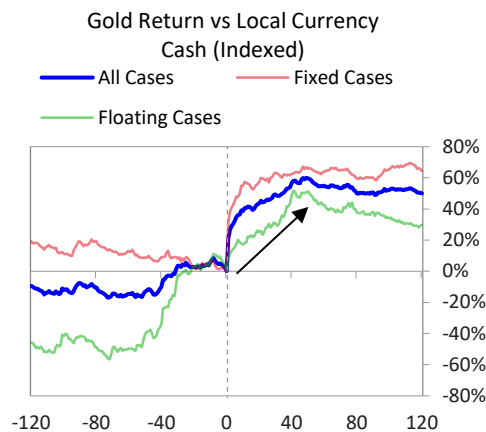
Stage 7: Debts are restructured and devalued. When managed in the best possible way (what I call a beautiful deleveraging), the deflationary ways of reducing debt burdens (e.g., through debt restructurings) are balanced with the inflationary ways of reducing debt burdens (e.g., by monetizing them) so that the deleveraging occurs without having unacceptable amounts of either deflation or inflation.

When the debt burdens become too great, a big restructuring and/or devaluation that substantially reduces their size and value will happen, either by itself or with the help of good management.

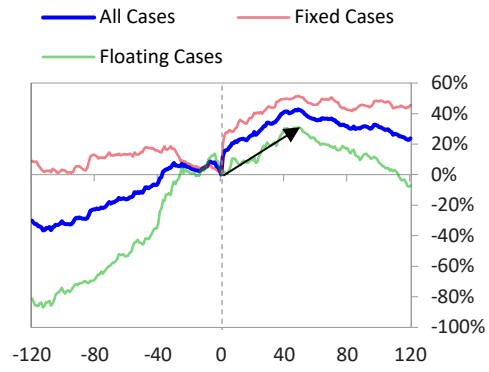
The currency devalues and the remaining holders of the currency and the debt take big losses in real terms. The loss of purchasing power continues until a **new monetary system is established** with enough credibility to entice investors and savers to hold the currency again. Typically, this involves a substantial write-down and restructuring of the debt.



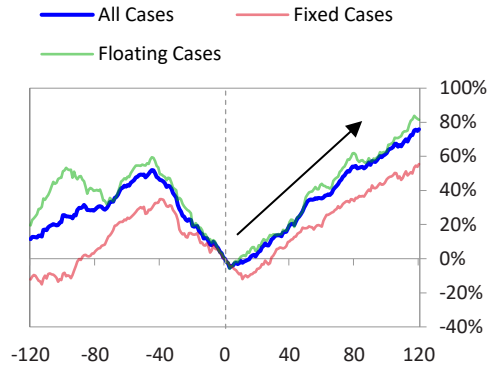
Government debts devalue relative to real assets like gold, stocks, and commodities. Perhaps this time, digital currencies like Bitcoin will benefit. The charts below show the average devaluation of currency and debts across the cases relative to 1) gold, 2) commodities, and 3) equities. **On average, gold outperforms holding the local debt at equal risk in these cases by roughly 60% from the start of the devaluation until the currency bottoms.** Notice the big difference in what happens in the fixed exchange rate and the variable (fiat) exchange rate cases.



Commodity Index Cumul Excess Ret (Idx to Start)



Equity Cumul Excess Returns (Indexed)



You can see the individual returns of the various assets by case in the table below.

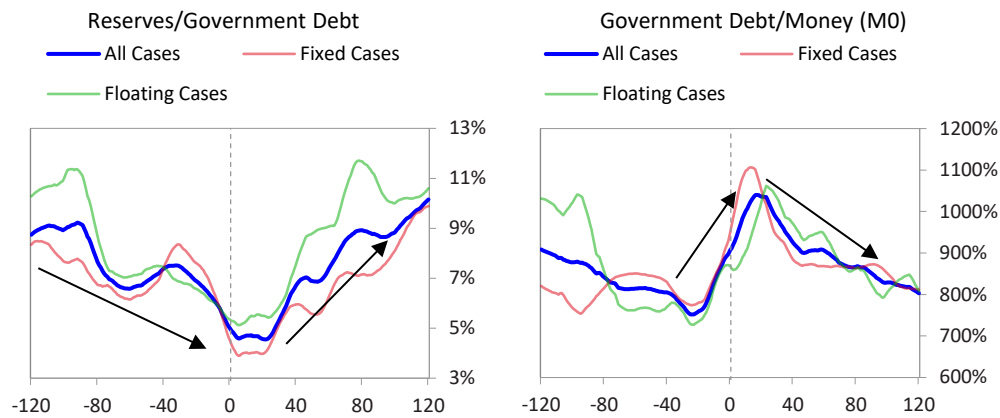
Asset Returns During Currency Devaluations and Debt Writedowns (Excess Return)

	Individual Assets (at 15% Vol)				Assets vs Debt/ Currency	
	Gold (in Local FX)	Commodity Index (in Local FX)	Equities	Nominal Bonds	Gold vs Bonds (Vol-Matched)	Equities, Gold, and Cmd vs Bonds (Vol-Matched)
Average Return	81%	55%	34%	-5%	94%	71%
Median Return	66%	49%	3%	-2%	71%	38%
JPN: World War II	282%	203%	100%	-53%	335%	260%
DEU: Weimar Hyperinflation	245%	241%	754%	-99%	501%	516%
USA: 1971 Devaluation	185%	162%	-44%	-6%	191%	141%
ITA: World War II	173%	156%	92%	-28%	201%	154%
USA: Great Depression	149%	70%	33%	19%	130%	68%
JPN: Great Depression	146%	73%	60%	30%	116%	72%
ITA: Early 20s Deval	126%	105%	-22%	-15%	141%	71%
USA: Late 70s Devaluation	109%	56%	3%	-33%	143%	104%
GBR: Late 70s Devaluation	88%	23%	22%	19%	69%	37%
GBR: Great Depression	81%	-4%	-8%	26%	56%	2%
GBR: Post-WWII Devaluation	75%	57%	11%	19%	57%	38%
ITA: Late 70s Devaluation	73%	20%	-16%	-42%	114%	79%
FRA: Early 20s Deval	73%	87%	43%	-11%	84%	59%
FRA: World War II	71%	90%	11%	-14%	86%	66%
GBR: 08 Financial Crisis	71%	11%	24%	52%	19%	-4%
GBR: World War II	66%	52%	8%	18%	49%	31%
TUR: 2018 BoP Crisis	66%	40%	63%	-27%	144%	165%
USA: 08 Financial Crisis	63%	2%	16%	55%	7%	-27%
MEX: 1982 Default	53%	73%	-27%	-81%	134%	131%
ARG: 1990s Hyperinflation	47%	54%	-	-	-	-
TUR: 1994 BoP Crisis	46%	51%	-1%	-50%	97%	99%
MEX: Tequila Crisis	40%	47%	-18%	-42%	82%	77%
JPN: 08 Crisis + Abenomics	38%	-21%	61%	49%	-11%	-22%
BRZ: 2002 BoP Crisis	31%	33%	-11%	1%	25%	15%
ITA: Euro Debt Crisis	28%	-2%	-16%	11%	17%	-6%
ESP: Euro Debt Crisis	28%	-2%	-15%	39%	-11%	-34%
BRZ: 1999 Peg Break	27%	16%	-3%	-6%	33%	26%
BRZ: 2014 BoP Crisis	25%	-11%	-14%	-2%	49%	24%
JPN: Post-Bubble Deval	23%	64%	6%	48%	-25%	0%
GRC: Euro Debt Crisis	23%	-13%	-50%	-49%	71%	30%
ARG: 2001 Peg Break	20%	14%	-4%	0%	21%	16%
TUR: 2001 Hyperinflation	13%	1%	-13%	22%	-9%	-22%

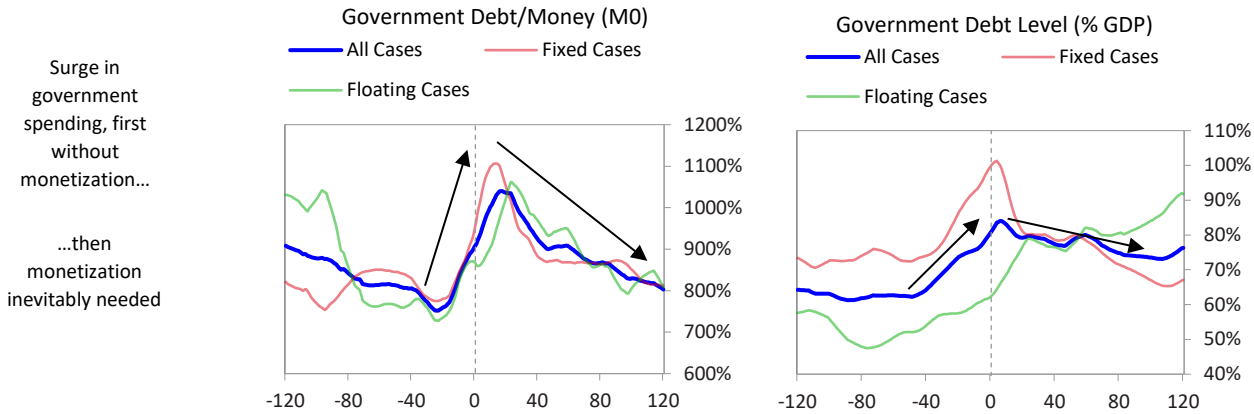
Table shows returns from the moment of devaluation through to the period where the currency has settled at a new equilibrium (i.e., in the US Great Depression, returns are shown from the month of peg break to shortly after; in cases where the devaluation was more drawn out, returns are shown for the full period of devaluation). We would consider the returns figures in individual cases to more indicative than exact, because getting returns and volatility adjusting is imprecise in cases with market closures, defaults, and in cases where we have lower-quality data.

When debts are restructured and/or devalued, it is typically a terrible time in markets and economies, but this terrible time reduces the debt burdens and establishes the foundation for the improvement. In the archetypical case, debt levels rise significantly relative to the monetary base in the run-up to the crisis, requiring the private sector to absorb a much greater amount of government debt with the same quantity of base money in circulation (which is likely a part of why we see upward pressure on interest rates at first in many of our cases). Eventually, when the pressure becomes too great, the central bank steps in and monetizes the debt, resulting in an expansion of the monetary base and a decline in the debt-to-money ratio.

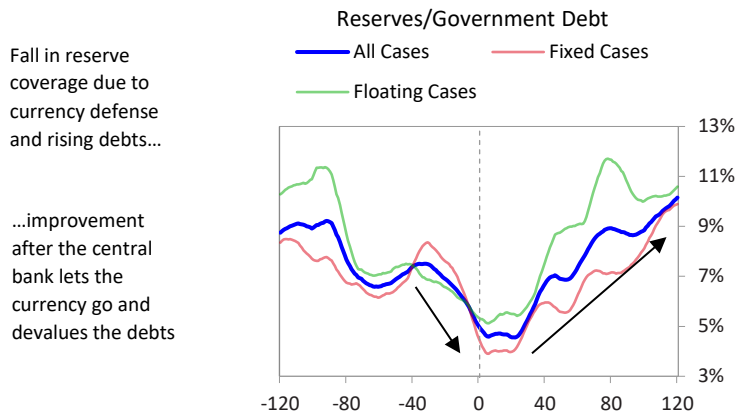
The ratio of reserves to debt typically falls at first, then rises. Typically, at this stage, we see reserves fall relative to debts—at first because debt levels are increasing quickly, then additionally because reserves are being sold in an attempt to defend the currency. After policy makers give up and let the currency go, we see this ratio improve as the devaluation of the currency mechanically reduces the value of local currency debts relative to hard currency assets and improves the country’s competitiveness, helping it to earn more in hard currency terms.

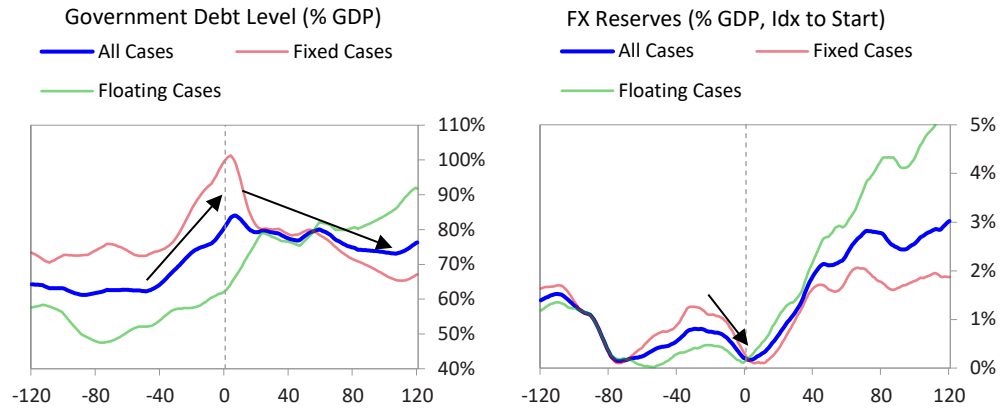


The chart below shows how the path of government debts and the monetary base typically line up. Typically, we see government debt rise first (usually in response to some crisis) while money growth is by and large unchanged (and in fact slows at the point of the cycle where the central bank tries to mount a currency defense). The government typically tries to control things through various techniques like foreign exchange controls or managing the currency (e.g., sometimes having an official foreign exchange rate that is different from the market rate). These controls create market distortions and do more harm than good. After the central bank gives up and lets the currency go, the pace of money printing picks up and helps to produce inflation that improves the government's nominal incomes relative to its debts. This dynamic was by and large similar across pegged and non-pegged cases.



The next three charts show government debt against reserves; the fall in reserves relative to debts is driven mostly by the rise in government debt but also by the selling of reserves late in the cycle to try to fight off the collapse of the currency. After the selling stops and the currency devalues, we typically see an improvement in the ratio as the devaluation lowers the value of local currency government debts relative to any remaining hard currency assets.

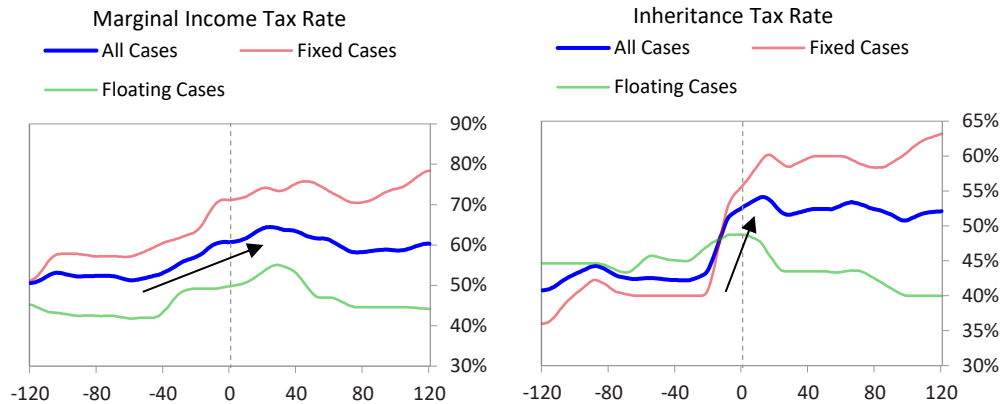




Stage 8: At such times, extraordinary policies like extraordinary taxes and capital controls are commonly imposed.

At this point, the government is cash-strapped and typically raises taxes to try to meet its financing need. The prospect of greater taxation puts additional pressure on households and businesses to move what they can out of the country. In response, governments often enact capital controls to try to stem these outflows, though at this point the economic pressure to leave the country and currency is too great for governments to stop the bleeding.

The charts below show a few different perspectives on tax rates across cases. You can see, for example, that both marginal income tax rates for top earners and inheritance tax rates rose by about 10% in the years going into the devaluation.²



Higher tax rates typically go hand in hand with capital controls in order to try and prohibit money from fleeing the country in response. You can see just how common this was in the table below:

²Note that tax rate data only covers the US, the UK, Japan, Germany, and France.

PERIODS OF STRICT/RISING CAPITAL CONTROLS

	1900	1920	1940	1960	1980	2000
UK	Yes	Yes	Yes	Yes		
USA	Yes	Yes				
China			Yes	Yes	Yes	
Germany	Yes	Yes	Yes	Yes		
France	Yes			Yes		
Russia	Yes	Yes	Yes	Yes	Yes	Yes
Austria-Hungary	Yes					
Italy		Yes				
Netherlands				Yes		
Japan		Yes		Yes		

3

³While this diagram is not exhaustive, I include instances where I could find clear evidence of each occurring in the 20-year period. Relevant capital controls were defined as meaningful restrictions on investors moving their money to and from other countries and assets (although this does not include targeted measures directed only at single countries, such as sanctions).

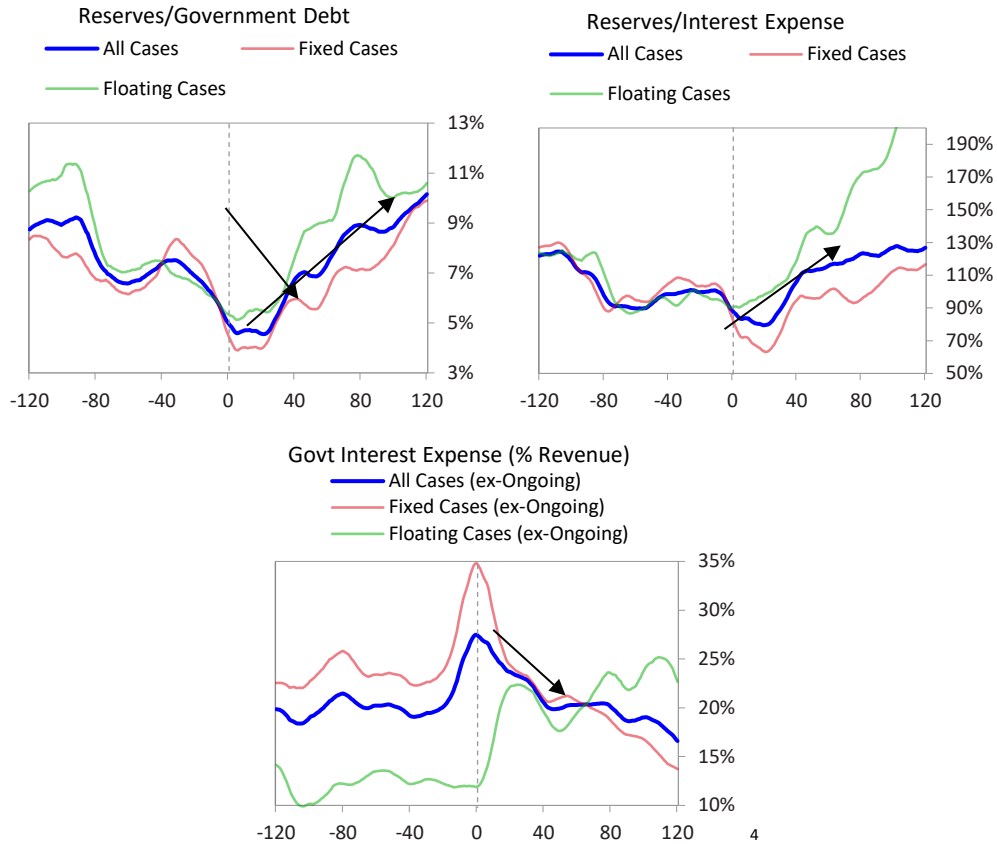
Stage 9: The deleveraging process inevitably creates a reduction in the debt burdens that creates the return to equilibrium.

Quite often, when there are inflationary depressions so the debt is devalued, at the end of the cycle, government reserves are raised through asset sales, and a strictly enforced transition from a rapidly declining currency to a relatively stable currency is achieved by linking the currency to a hard currency or a hard asset (e.g., gold) by the central bank while having very tight money and a very high real interest rate, which severely penalizes the borrower-debtors and rewards the lender-creditors, which leads to the buying of the currency/debt which stabilizes the currency/debt.

At this stage, the currency has devalued and the remaining holders of the currency and the debt have taken big losses in real terms, which has relieved a lot of the debt burdens of the debtors. Now, it doesn't take much to back up the debt, stabilizing it and the currency. When managed well, the government raises reserves, sometimes by selling government-owned assets, sometimes by getting IMF or other loans requiring sound financial policies including austerity. At this stage, the interest rate is still high—in fact very high in relation to the prospective inflation rate and the prospective rate of depreciation in the currency, which means that the central bank can make the debt-money an attractive investment again, and debt in that currency very expensive, if they manage the situation well. This is when **a new and more stable monetary system is established** with enough credibility to entice investors and savers to hold the currency again. Typically, this follows a substantial write-down and restructuring of the debt along with a return to some form of hard money (e.g., a peg to gold or another stable currency). And this typically requires a set of fundamental adjustments that improve the country's balance sheet and income statement.

The five classic steps typically necessary to make the transition are:

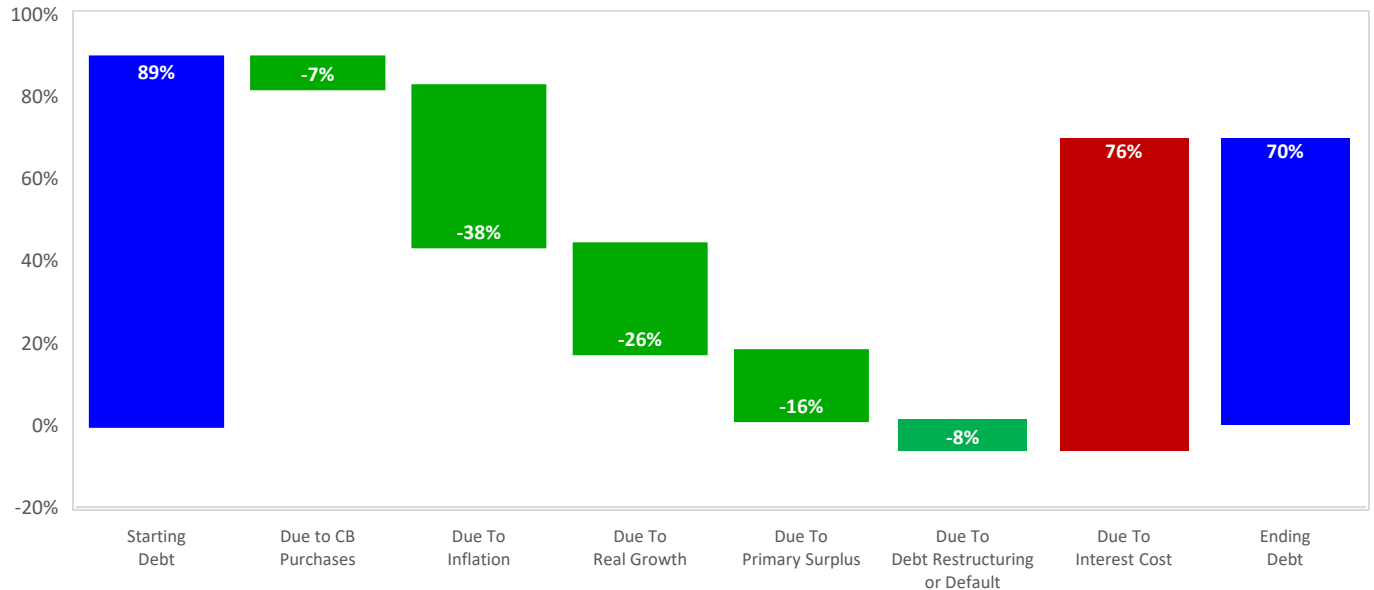
1. **A restructuring of the country's debts to manageable levels** where reserve assets can cover a substantial portion of liabilities and the government's debt service no longer exceeds its revenue growth. Typically, defaulting and restructuring foreign currency debts and some local currency debts is required, too.



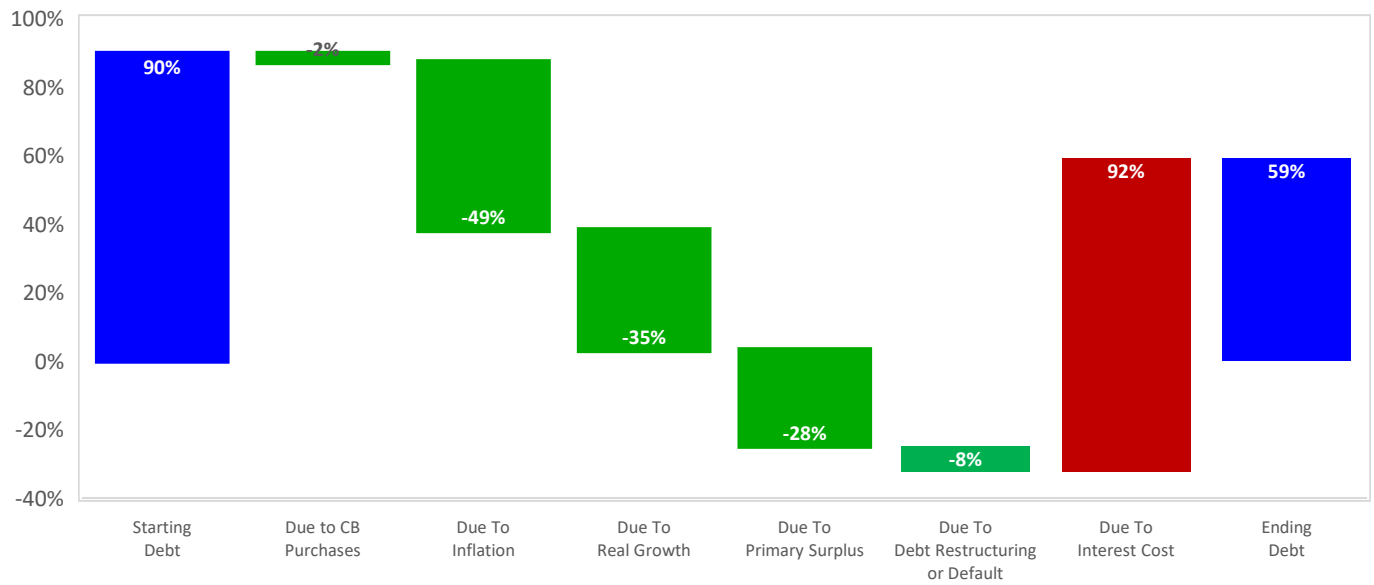
The two charts below show an attribution of what has happened to government debt-to-GDP following the devaluation, on average across our case set. You can see below that in the average case, central government debt was at 89% of GDP around the time of the devaluation. The green bars show the factors that worked to bring the debt-to-GDP ratio down—on average 7% came from central bank purchases, 38% was due to inflation, 26% was due to positive growth in real GDP, 16% was due to primary surpluses, and 8% was due to defaults or restructuring of the debt; and the red bar showed what led it to rise—76% driven by continued interest payments. The net of these is that in the average case, debt falls from 89% to 70% of GDP and that rising inflation and rising real growth arising from aggressive stimulations were the big forces behind the debt burden reduction. Said differently, governments that have debt in their own currencies 1) made their interest and principal payments by having their central banks create money and credit, raise inflation, and stimulate real growth, and restructuring debts which raised nominal income growth relative to debt service payments and 2) restructured defaulted debts in the amounts shown. While this chart shows all cases, this was especially true in the cases in which the currencies were denominated in monies that the central banks could produce. In fact, in most cases the debt problems never went away as much as they remained a manageable burden handled in the way described. Of course, these are average numbers and the ranges around them are large, though the patterns are pretty consistent.

⁴ To show a clearer picture of how the government's balance sheet evolves in the upswing and downswing of the cycle, these charts exclude a handful of recent cases (the US, Europe, the UK, and Japan post-financial crisis) that are still playing out.

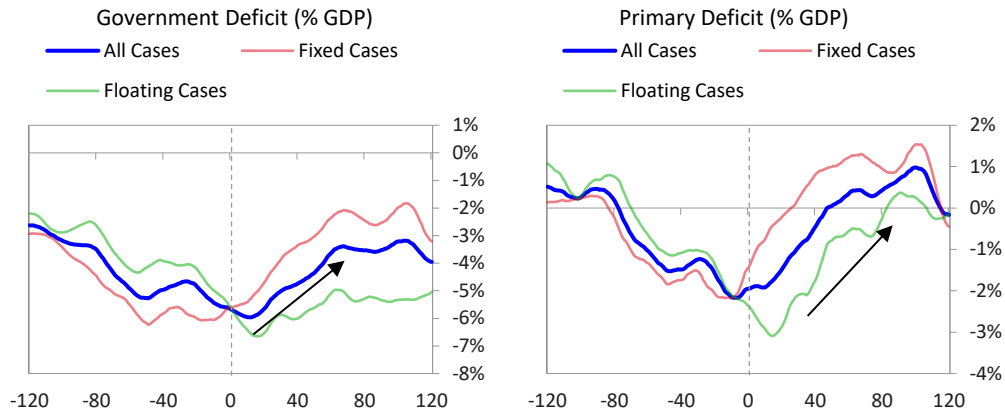
Attribution of Archetypical Decline in Government Debt-to-GDP



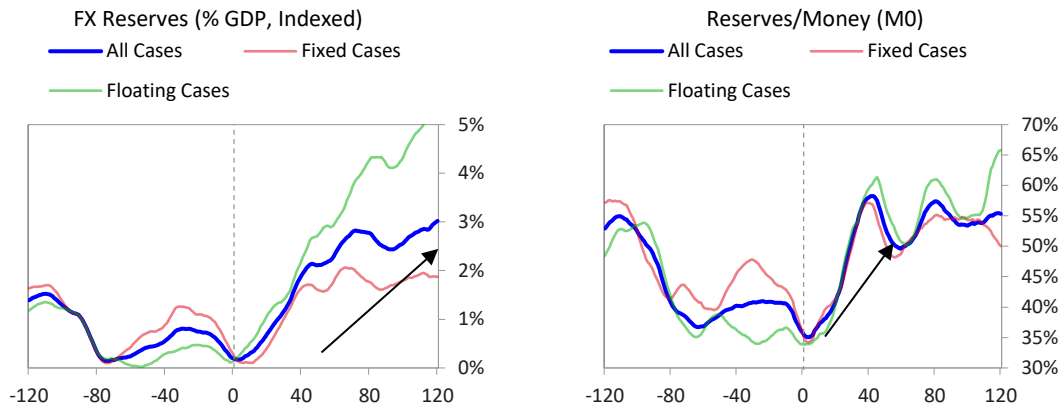
Attribution of Archetypical Decline in Government Debt-to-GDP (ex-Ongoing Cases)

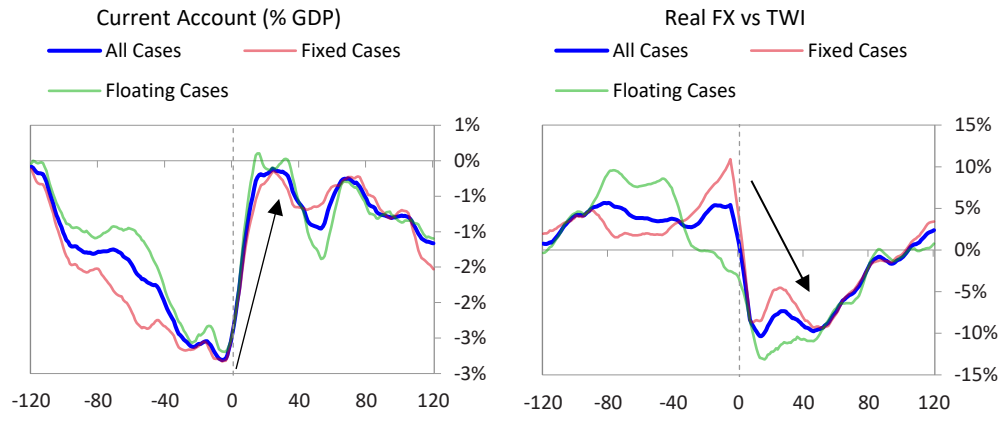


- A deep, painful fiscal policy adjustment** to make the country's finances sustainable without requiring the printing of money to monetize the debt. Making some deep, painful fiscal policy adjustment from the central government and healthy balance of payments adjustments is usually required. It is typical to see a bigger improvement in the primary deficit before the government is able to reduce interest costs by rolling into lower rates.

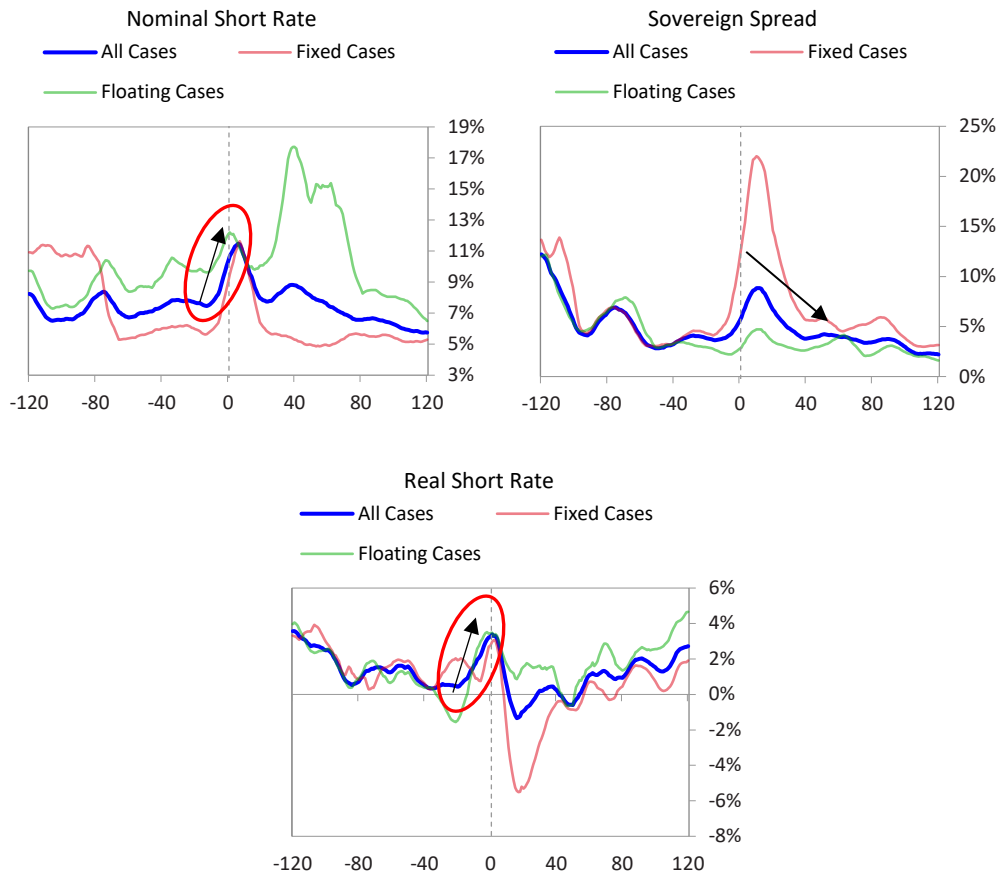


3. **Obtaining sufficient quantities of reserves to defend the currency (or back the new currency if the old, collapsed currency is being replaced) is typically part of the process.** The devaluation of the currency typically helps with this both because the fall in the exchange rate increases the value of the country's reserves relative to its nominal liabilities and because it improves the country's competitiveness, helping to increase export incomes relative to import costs. In addition, we see a combination of asset sales to build up reserves further and occasionally borrowing from official creditors (which at this point are among the few parties still willing to lend). Also, typically government-owned companies and other assets are sold off at this stage, which brings in money for reserves and improves efficiencies of these businesses.

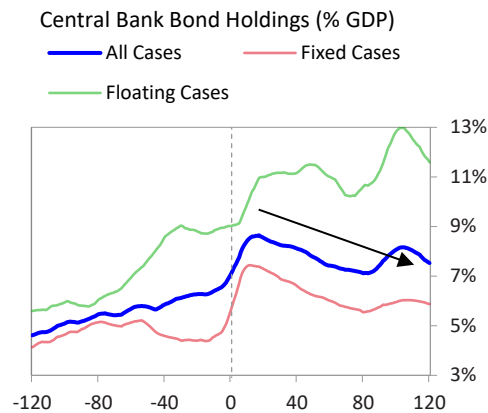




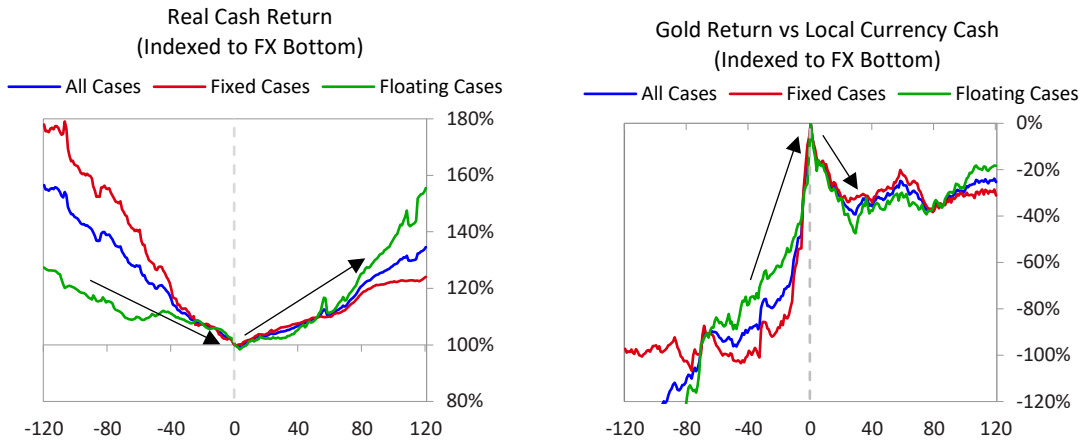
4. **High real interest rates** that more than adequately compensate investors for the risks of holding the currency. The charts below show the nominal interest rates on local currency and hard currency debts.



5. **Placing limits on what the central bank can do that would undermine sustainable finances of the new stable money.**



When these conditions are met, it's among the best times to hold the country's currency and debt.



That is what the end stages of the typical Big Debt Cycle look like to me. Let's now return to the very big picture level and look at how that Big Debt Cycle has played out over the last 80 years.

