

Notes on Fiscal Policy in a Low-Interest Rate Environment:

Reinhart-Rogoff Issues

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Consider the simplest Diamond overlapping-generations model. An infinitely-lived government can sell bonds, levy taxes, and make purchases of a durable utility-yielding public good. Agents live for two periods, start young, age into old, with one unit of young is born each period. Agents inelastically produce one unit of output when young. All the agents young in a generation are the same one of two types: impatient (i) young or patient (p) young.

Impatient (i) young have a utility function:

$$(1) \quad U_i = C_y + C_o/(1+r_i-g) + P$$

Patient (p) young have a utility function:

$$(2) \quad U_p = C_y + C_o/(1+r_p-g) + P$$

with $r_i > g > r_p$, and where P is utility from the government's public-good purchases

In each period, the government has to:

- pay off its old bonds D_{t-1} with either $(1+r_i-g)D_{t-1}$ or $(1+r_p-g)D_{t-1}$, depending on whether the old were patient or impatient when young.

- sell its new bonds D_t
- use any surplus from its debt management to purchase units of the public good
- cover any deficit from its debt management by levy distortionary taxes that yield an amount τ at a price of reducing the consumption of the young by $\tau(1+\xi)$.

And let the government's social welfare function be linear: a sum of the utilities of agents from their private decisions and taxation and of the amount of public good purchased.

Suppose that the initial young are impatient, that there is a probability μ each generation that the new young are of a different type, and that patience is an absorbing state: As long as the young remain impatient, there is nothing for the government to do.

Suppose that the initial young are patient, that there is a probability μ each generation that the new young are of a different type, and that impatience is an absorbing state: If the government were to issue one unit of debt, spends it on the public good, and then tax the next generation's young $(1+r_p-g)$ to pay off the debt, and continue to rollover the debt until an impatient generation is born, then there would be an expected net addition to social welfare of:

$$(1) \quad \text{NB: } 1 + (g-r_p)(1/\mu-1) - (1+\xi)(1+r_p-g)$$

which will be positive as long as

$$(2) \quad (g-r_p) > \xi/(\xi + 1/\mu)$$

If not, then because of the linear costs, it is not worth incurring even one red cent of debt.

Thus whether debt should be incurred as a way of assisting patient households in transferring wealth from the present into the future depends on the benefits and costs. The benefits from incurring and maintaining the debt depend on the value of the debt as a way of providing the economy with safe assets—on the value of $(g-r_p)$. The costs depend on the chance that the debt will have to be unwound rapidly—on the value of μ . And the costs depend on how painful it will be to raise the explicit or implicit taxes—the value of ξ —needed to pay down the debt should

asset prices shift to a configuration in which households are not patient but rather impatient.

In assessing the net benefits (or costs) formula:

$$(3) \quad NB = (g-r_p)(1/\mu + \xi) - \xi$$

It is important to construe the benefits (and costs) broadly. In the model the benefits come from the fact that government debt provides the economy with the safe savings vehicles that the financial system so desperately needs if it is to satisfy patient households' wish to transfer wealth from the present into the future. But there are other benefits as well: to name only the two most important, the increase in resource utilization in a depressed economy, and the surplus from public investment.

The costs should similarly be assessed broadly.

In the model, the costs are the burden of the distortionary broad-based taxation needed to retire the debt when households become impatient and when thus the government's debt operations turn from a profit to a cost center. But what if there are limits to the size of the primary surpluses that the political system will allow the government to run? Then the costs are not the limited and known costs of imposing distortionary taxes but rather the unknown costs of "fiscal dominance".

Suppose that the political system that will a run primary surplus from broad-based taxes less programmatic spending, as share of GDP, of σ but no more. Suppose that interest rates will normalize to the impatient-household value r_i . Suppose the real growth rate of the economy is g over the long run. Call the nominal debt D , the price level P , and real GDP Y . Then because the basic debt amortization equation is:

$$(4) \quad (r_i-g)(D/P) = \sigma Y$$

the price level is going to be:

$$(5) \quad P = ((r_i-g)/\sigma)(D/Y)$$

Under conditions in which $r_i - g$ is relatively large and the politically-attainable primary surplus share σ is relatively small, then the price level will move in such a way as to force the debt-to-annual-GDP to $(\sigma / (r_i - g))$. Under conditions of fiscal dominance, a high debt orders a much higher price level. And the market will get you there in short order. The financial, fiscal, and economic chaos generated by this arrival of the long run in the form of fiscal dominance-driven inflation may well be very costly.

The logic of fiscal dominance was first laid out by John Maynard Keynes in the advice given to the French government in the early 1920s. It sought ideas for how it could halt France's ongoing inflation. Keynes's response was: you can't, and you shouldn't try. In such a situation of fiscal dominance, there is no escape from inflation short of much-higher primary surpluses, which may themselves be strongly undesirable.

In weighing the costs, it is important to assess the chance that resolving the debt will end not in broad-based taxes but in fiscal dominance-driven inflation, and it is important to assess the costs of that inflation.

The third option is for the government to respond to the shift of households toward impatience by finding policies to keep the economy's interest rate on Treasury debt r at or less than its growth rate g . This is financial repression. Force public and other pension funds to hold Treasury debt. Encourage sovereign wealth funds to hold Treasuries. Regulate banks via "macroprudential" regulation to require that they hold 100% of their insured deposits in Treasury bonds. As Carman Reinhart has reported, macroprudential regulation is an effective false flag for policies of financial repression. Such policies in the North Atlantic have been extraordinarily successful both after WWI and after WWII, at least when countries are willing to adopt them whole-hog.

Thus financial repression is another possible post-normalization scenario. However, it imposes a first-order distortion in the financial market. It taxes savers. It taxes financial intermediation. It taxes financial deepening. And it is likely to be a bad tax--good taxes have broad bases and low rates, while bad taxes have narrow bases and high rates. The only plus to financial repression is that it may be an effective way of getting around the limits on the politically-attainable explicit primary surplus from taxation, to the extent that its forms of seigniorage remain

invisible to a political system that lacks financial sophistication, and that financial repression has lower costs than fiscal dominance-driven inflation. Financial repression, however, may well be the most likely policy response to the shift to impatience. Hence the central issue in assessing the risks and costs of high debt is assessing the costs of that financial repression.

Suppose that a country with high debt finds households shifting to impatience, its government takes a look at the interest burden of supporting the government debt, and decides on financial repression under the flag of "macroprudential regulation": requiring investment and commercial banks, public and private pension funds, shadow banks, and other financial intermediaries to hold large shares of their portfolios in Treasuries. Reinhart and Rogoff argued that even in this case there were significant growth costs to high debt. Governments could not evade these costs even if they successfully undertook policies of financial repression to keep interest rates low--and thus limited costs to the government--and managed to keep inflation rates low--and thus limited broad economic disruption.

Thus, for example, the November 2012 Medium Term Financial Statement of the government of Ireland states:

Figure 4.1 shows that of the estimated €192 billion General Government debt level at end-2012, almost 30% of it relates directly to support provided by the sovereign to the banking sector. Excluding that support, the end-2012 debt-to-GDP ratio would be of the order of 90%. This is a level viewed as being a significant marker in terms of debt. Below it, a State's debt level is generally seen to be a safe one, whereas a debt ratio above 90% is generally viewed as one that is an impediment to economic growth.

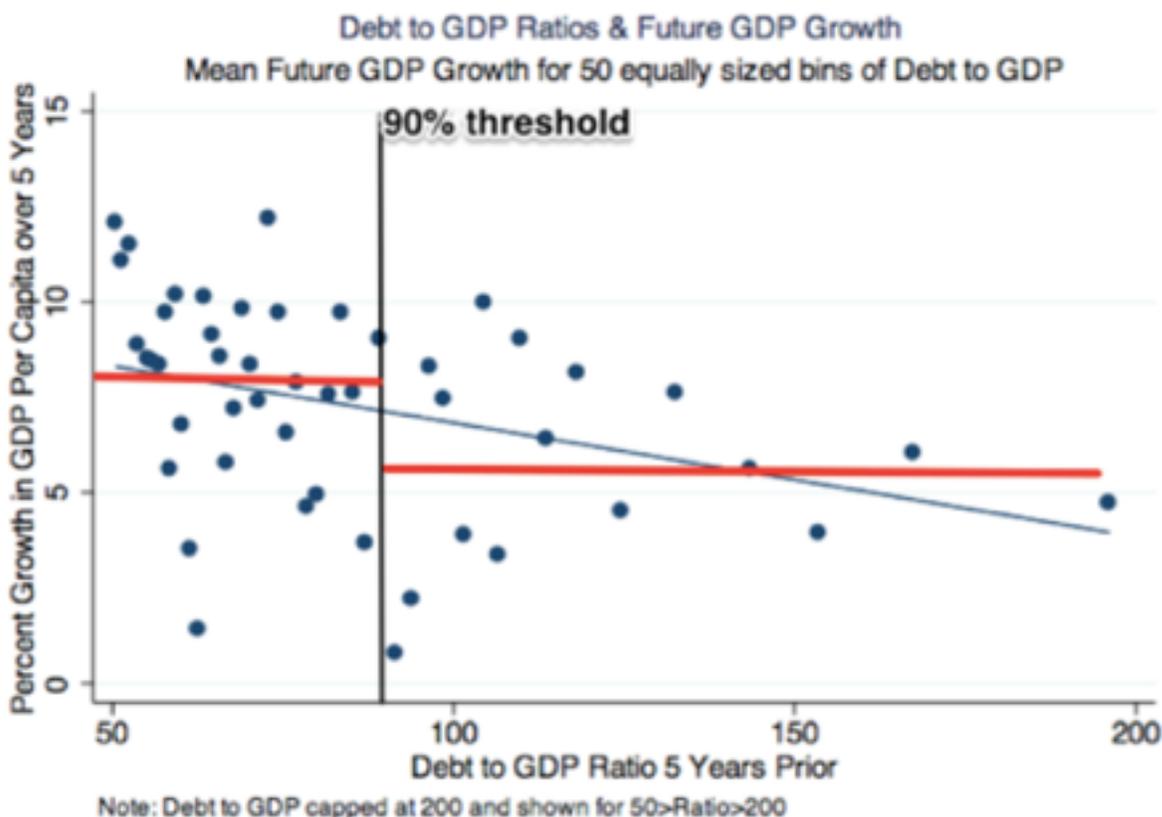
This is an interpretation of Reinhart and Rogoff's conclusion in "Growth in a Time of Debt" that:

it is evident that there is no obvious link between debt and growth until public debt reaches a threshold of 90 percent. The observations with debt to GDP over 90 percent have median growth roughly 1 percent [per year] lower than the lower debt burden groups and mean levels of growth almost 4 percent lower...

But there need to be caveats. Much of the debt and growth correlation runs from low growth to high debt, and not the other way around. Italy and Japan in recent

years have had high debt levels, but these are primarily a result of rather than a cause of slow-growth episodes that began well before the debt climbed far above its previous levels. For another, much of the correlation is due to a third factor—World War II itself. The defeated Axis powers had very low debt after World War II due to debt repudiation. The defeated Axis powers also had very high growth rates after World War II as they rebuilt. Britain had a very high debt-to-annual-GDP ratio after World War II, and Britain since World War II has had slow growth for an OECD economy. But the British growth rate did not pick up as its debt-to-annual-GDP ratio declined. Thus the bulk of the debt and growth correlation, in the post-WWII OECD at least, is not the product of a causal link from high debt to lower growth.

Figure 1: Post-WWII Debt-to-Annual-GDP Levels and Five-Year Subsequent Growth Rates: Means for 50 Equal-Observation Bins



Last and most important, as evidenced by Owen Zidar (2012) and many others, there is no sense in which a 90% debt-to-annual-GDP ratio has any significance whatsoever as a meaningful threshold. Growth declines gradually and smoothly from 1.6%/year at a debt-to-annual-GDP ratio of 50% to 1.0%/year at a debt-to-annual-GDP ratio of 160%: that is a decline in growth of 0.05%/year for every additional 10%-point increase in the debt-to-annual-GDP ratio.

The post-WWII OECD data tells us that the debt-and-growth correlation is small in magnitude. The post-WWII OECD history tells us that most of that correlation is not generated by a causal chain from high debt to low growth. The presumption, therefore, appears to be that the costs of financial repression appear manageable.