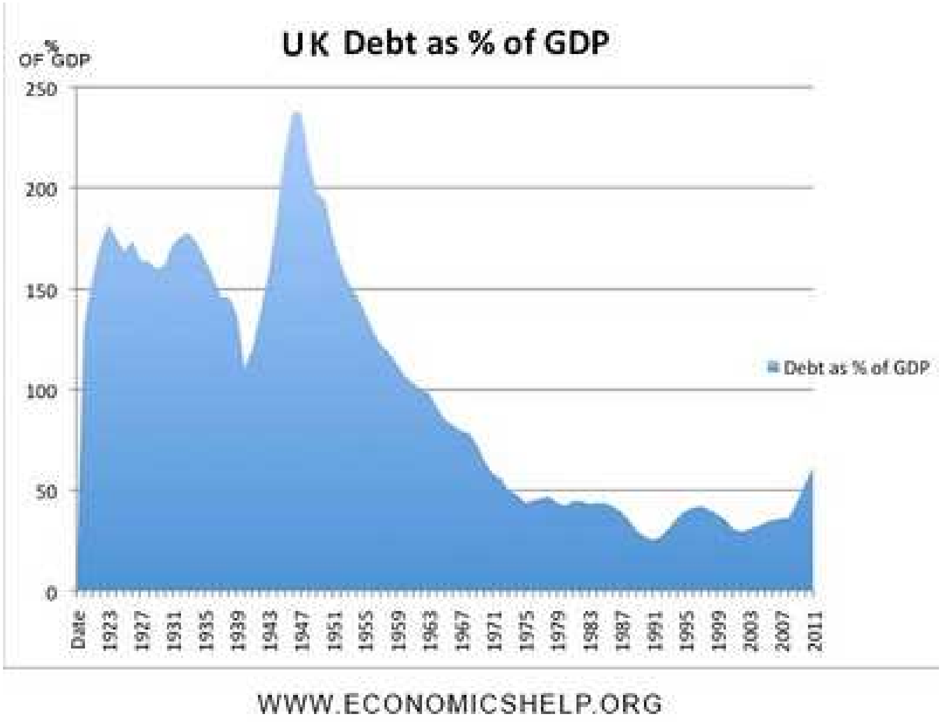
If we have a budget surplus ($G < T$) then next period government debt will decrease. What is the main structure of government debt? It is clear that a government debt depends on public spending. The biggest parts of public spending in all developed countries are represented by Pensions, Health, Welfare expenditure (unemployment benefits, family support, etc. etc.), Education and Interest payments on outstanding debt. Not all those parts belong to what we have called public expenditure in the IS-LM and AD-AS. In those models the public expenditure was spending on goods and services that can create extra income. For example, pension expenditure or welfare expenditure (like unemployment benefits) do not buy any good or service but represents transfer from a part of the population (workers) to another part (pensioners or unemployed). The same applies for interest expenditure on outstanding debt.

For example in UK we have the following main expenditure voices as a percentage of GDP in 2010:

Public Spending 2010	**% GDP**
Health care	8.13
Pensions	7.95
Welfare	7.40
Education	5.8
Interest payments	[illegible]
Defence	2.98

Source: www.ukspending.co.uk

The next figure shows the evolution of the government debt as a percentage of GDP in UK. You can see that the debt-GDP ratio exploded during the war when it reached more than 200% (the value of the public debt was more than twice the value of total output produced in UK in that period). Notice that as public debt is measured in current prices we divide it by the nominal GDP in each year to get the debt-GDP ratio. Notice that after the 60s the government debt in UK as been quite stable as a percentage of GDP and well below the 50%. Because of the credit crunch the government debt has increased and it is now well above the 50% threshold.



In this lecture note we want to understand what are the economic consequences of having a high government debt and in particular the possible costs and benefits of having a high public debt.

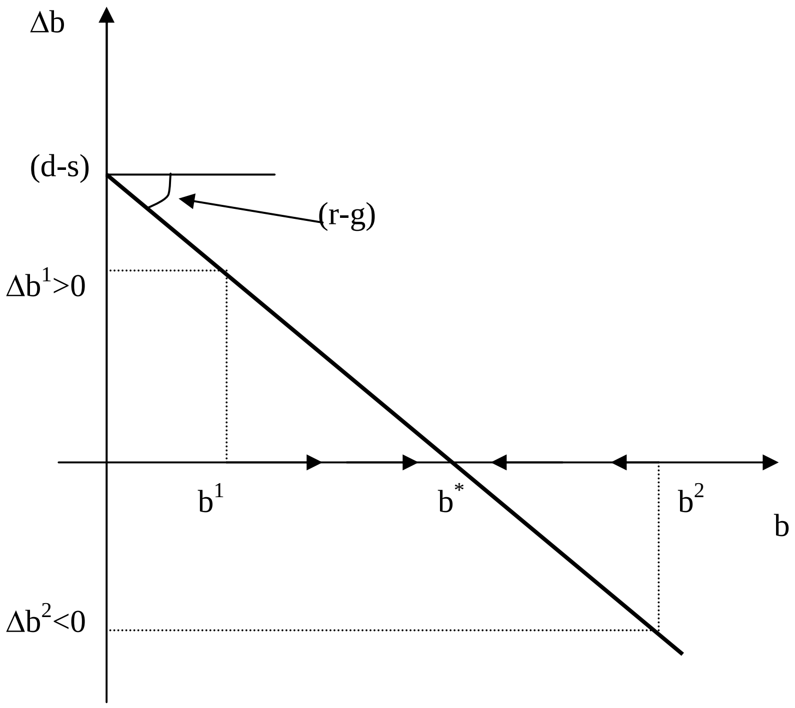
Sustainability of Government Debt

In the following table we report the government debt (as a percentage of GDP) in various countries in 2009.

Countries	**Debt as % GDP in 2009**
Zimbabwe	282.6
Japan	192.9
Italy	115.8
Greece	113.4
France	77.6
Germany	73.2
UK	68.2
Ireland	64.8
US	53.5
Spain	53.2
Libya	3.9

Source: CIA World Factbook

Why Ireland and Greece had a public debt crisis while Italy and Japan did not (yet)



The graph tells you something very important: if $g > r$ independently where we start from, the economy converges to the steady state level of the debt-GDP ratio. Suppose we start with $b^1 < b^*$. At the level of debt $\Delta b > 0$ so the debt-GDP ratio increases over time till we arrive at b^*. More interestingly suppose we start with a high level of debt-GDP ratio $b^2 > b^*$. At that level of debt $\Delta b < 0$ and the debt-GDP ratio decreases over time till we arrive at b^*. ***The debt-GDP ratio is stable when*** $g > r$.

Notice that in the graph we assumed that the government is running a primary deficit ($G > T$) bigger than the seigniorage revenues. Nevertheless even if the debt-GDP ratio is very high it will converge to the steady-state.

Result: *if* $g > r$ *the debt-GDP ratio is stable. Independently on what the initial level of the debt-GDP is, it will converge to the steady state level.*

Notice that if we had $g > r$ and $d - s < 0$ we have a negative steady state (the country will be a creditor, something very unlikely in the real world) but it will still be stable. The economy will converge towards it.

Now assume that: $r > g$ and $d - s < 0$. Then equation 8) implies a positively sloped line with a negative intercept.