A diagramatic solution of the NK model with inflation (loosely based on Williamson's book)

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1 Introduction

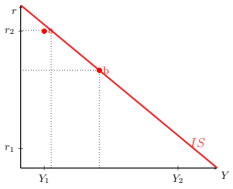
Here we extend the analysis in Williamson's book by plotting the several figures simultaneously. The left half of below represents actual outcomes in the presence of sticky prices, while the right half shows the flexible-price equivalent values (these have the superscript n to denote natural values). We assume that expected inflation is equal to the inflation target in the analysis that follows.[1]

Before any shocks, the economy is at point a so that flexible and sticky price outcomes are the same (the output gap is zero). A sudden decrease in the nominal interest rate by the central bank

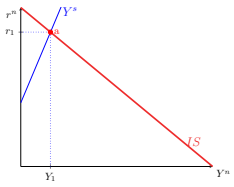
- lowers the real interest rate and as panel 1a shows, output increases (due to a rise in consumption and investment);
- this increase in output leads to an increase in inflation (panel 1c);
- nothing has happened to the production function so the increase in output is obtained by increases in employment;
- the monetary policy action affected the real interest rate only because of the sticky-price assumption but the flexible-price version of the model (the natural values) remain unaffected. Hence, the right half of the figure is unchanged. As a result, Y^n remains at a but Y has risen: output is greater than its flexible price counterpart. In other words, monetary policy is non-neutral.

In summary, an unexpected temporary decrease in the nominal interest rate leads to an increase in output and inflation but leaves the flexible-price level of output unaffected. You can easily work out the effects on wages, employment, etc.

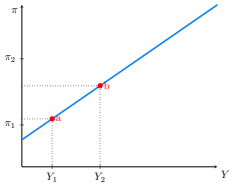
[1] I did not include the labour market under sticky prices but it is easy to see what is happening there.



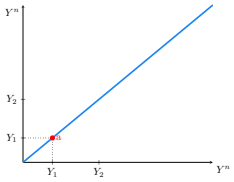
(a) IS



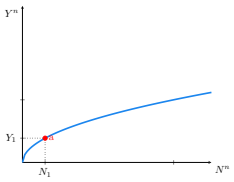
(b) IS-RBC



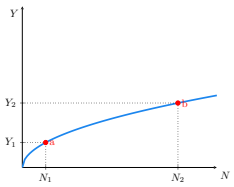
(c) Phillips curve



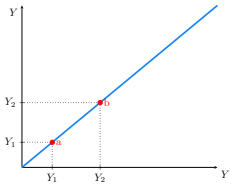
(d) Rotation



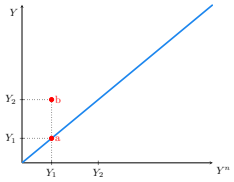
(e) Prod. function



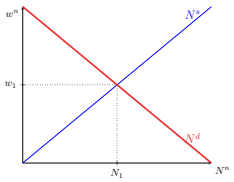
(f) Prod. function



(g) Rotation



(h) Output gap



(i) Labour market