Using the Flexible-Price Model

Basic Equations and Variables

In the flexible-price model, the equilibrium real interest rate r (at which the flow of savings into financial markets equals the flow of investment out of financial markets) is:

$$r = \frac{(C_0 + I_0 + G) + (X_{yf}Y^f + X_\varepsilon \varepsilon_0 + X_\varepsilon \varepsilon_r r^f) - \left(1 - \left((1-t)C_y - IM_y\right)\right)Y^*}{\left(I_r + X_\varepsilon \varepsilon_r\right)}$$

The key variables in the economy are then equal to:

$$Y = Y^*$$
$$C = C_0 + C_y(1-t)Y$$
$$I = I_0 - I_r \times r$$
$$G = G$$
$$NX = X_f Y^f + X_\varepsilon \left(\varepsilon_0 + \varepsilon_r (r^f - r)\right) - IM_y Y$$

and

$$\varepsilon = \varepsilon_0 + \varepsilon_r \left(r^f - r\right)$$
$$GX = X_f Y^f + X_\varepsilon \left(\varepsilon_0 + \varepsilon_r \left(r^f - r\right)\right)$$
$$IM = IM_y Y$$

Where:

       Y – real GDP, or national income
       Y* – potential output
       C – consumption spending
       I – investment spending
       G – government purchases
       NX – net exports

C_0 – the "baseline" level of consumption spending
C_y – the marginal propensity to consume
t – the tax rate
I_0 – the baseline level of investment
I_r – the sensitivity of investment to changes in the interest rate
r – the (long-term, real, risky) interest rate
Y^f – foreign national income
ε – the exchange rate
X_f – the proportion of foreign national income spent on domestic exports
X_ε – the sensitivity of exports to the exchange rate
IM_y – the proportion of domestic national income spent on imports
ε_0 – foreign exchange speculators' beliefs about the long-run value of the
       exchange rate—the value of foreign currency
ε_r – the sensitivity of the exchange rate to interest rate differentials
r^f – the (long-term, real, risky) foreign interest rate

Determining Equilibrium

In order to solve the model to ascertain the economy's equilibrium, (I) plug in the values of the parameters describing the economic structure and environment and the policy variables describing economic policy into the first equation above in order to determine the equilibrium value of the exchange rate, and (II) using that equilibrium value of the exchange rate (and the parameters and policy variables), solve for all of the quantities of interest in the economy.

Analyzing a Change

To analyze the effect of a shift in the economic environment or in economic policy on the economy's equilibrium, use comparative statics: identify how the equilibrium would be changed by the shift, and identify that change with the economy's response to the shift in the environment and policy.

Begin by examining the first equation to see what parts of the environment and of policy have changed. Then simplify the equation—keeping only the parts that change—and write it in Δ "changes" form. For example, if it is foreign interest rates and levels of

national income are the components of the economic environment that have shifted, write this first equation in "changes " form as:

$$\Delta r = \frac{X_f \Delta Y^f + X_\varepsilon \varepsilon_r \Delta r^f}{\left(I_r + X_\varepsilon \varepsilon_r\right)}$$

Then substitute this change in the equilibrium interest rate (and the changes in the economic environment or in economic policy) into the Δ "changes" form of the other equations—once again keeping only those terms that change. For example, in this case:

$$\Delta Y = 0$$

$$\Delta C = 0$$

$$\Delta I = -I_r \times \Delta r = -I_r \left(\frac{X_f \Delta Y^f + X_\varepsilon \varepsilon_r \Delta r^f}{\left(I_r + X_\varepsilon \varepsilon_r\right)} \right)$$

$$\Delta G = 0$$

$$\Delta NX = X_f \Delta Y^f + X_\varepsilon \varepsilon_r \Delta r^f - X_\varepsilon \varepsilon_r \Delta r = I_r \left(\frac{X_f \Delta Y^f + X_\varepsilon \varepsilon_r \Delta r^f}{\left(I_r + X_\varepsilon \varepsilon_r\right)} \right)$$

and

$$\Delta \varepsilon = \varepsilon_r \left(\Delta r^f - \Delta r \right) = \varepsilon_r \left(\frac{I_r \Delta r^f - X_f \Delta Y^f}{\left(I_r + X_\varepsilon \varepsilon_r\right)} \right)$$

$$GX = X_f \Delta Y^f + X_\varepsilon \varepsilon_r \left(\Delta r^f - \Delta r \right) = I_r \left(\frac{X_\varepsilon \varepsilon_r \Delta r^f + X_f \Delta Y^f}{\left(I_r + X_\varepsilon \varepsilon_r\right)} \right)$$

$$IM = IM_y \Delta Y = 0$$

This simple three-step procedure—(I) identify what the changes in the economic environment and economic policy are, (II) plug them into the "changes " form of the equation for the equilibrium interest rate, and then (III) plug the change in the equilibrium interest rate along with the changes in the economic environment and in economic policy into the equations for the other economic variables of interest—is all you need to know to use the flexible-price business-cycle model effectively.