A Model of Financial Autarky

Applied International Economics.

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Financial Autarky Model

In this model

Objectives

- Households **might not** be able to smooth consumption over time
- The trade balance cannot as a shock absorber

Assumptions

- Endowment economy
- Two periods
- Single good
- Imperfect capital mobility - households can only borrow/lend at the domestic capital market with price ρ

Budget constraints

For the two periods we have

$$b_1^d = y_1 - c_1, \tag{1}$$

$$0 = (1+\rho)b_1^d + y_2 - c_2, \tag{2}$$

where b_1 denotes net foreign assets and y_t is the endowment at time t.

Combining the budget constraints yields the intertemporal budget constraint (IBC)

$$y_1 + \frac{y_2}{1+\rho} = c_1 + \frac{c_2}{1+\rho} \tag{3}$$

Households

The households' utility function has the following form:

$$W = u(c_1) + \beta u(c_2). \tag{4}$$

Households choose c_1, and c_2 to maximize Equation (4) subject to Equation (3). The Lagrangian is as follows:

$$\mathcal{L} = u(c_1) + \beta u(c_2) - \lambda \left(c_1 + \frac{c_2}{1+\rho} - y_1 - \frac{y_2}{1+\rho} \right), \tag{5}$$

where λ is the Lagrange multiplier. The first-order conditions are:

$$u'(c_1) = \lambda, \tag{6}$$

$$\beta u'(c_2) = \frac{\lambda}{1+\rho}, \tag{7}$$

Households (continued)

If we combine both budget constraints we obtain our typical Euler equation

$$u'(c_1) = \beta(1+\rho)u'(c_2). \tag{8}$$

If we have the case that $\rho = r$, and $\beta(1+r) = 1$, we would have $c_1 = c_2$ (our first model)

Equilibrium conditions

Since the economy is closed, we have that:

$$b_1^d = 0. \tag{9}$$

If we combine Equation (9) with (1) and (2), we obtain that

$$c_1 = y_1, \tag{10}$$

$$c_2 = y_2. \tag{11}$$

In this case, the trade balance is zero for each period. The same is true for the current account.

Reduced-form solutions

In this closed economy model we have three endogenous variables: c_1, c_2, and ρ. We know that consumption equals output for each period. Now, we need to obtain ρ. Recall our Euler equation (8):

$$u'(c_1) = \beta(1+\rho)u'(c_2).$$

Rearrange and substitute consumption to obtain:

$$1+\rho = \frac{u'(y_1)}{\beta u'(y_2)}, \tag{12}$$

That is, in a closed economy, the domestic rate ρ will depend solely on the output path.

Example I: Stationary economy ($y_1 = y_2 = \bar{y}$)

Suppose output is constant, then,

$$c_1 = y_1 = y_2 = c_2 = \bar{y}.$$

Using the Equation (12), we obtain

$$1 + \rho = \frac{1}{\beta}$$

This is the same equilibrium as in our basic model! The reason is that since households have a constant output path, they have no reason to borrow or lend. In this case, being shutoff from international capital markets is not a problem.

Example II: Bad times ($y_1 < y_2$)

Suppose the economy experiences "bad times" in the first period. In this scenario, households cannot run a trade deficit to keep their consumption constant over time. Therefore, it follows that:

$$c_1 < c_2.$$

Then from Equation (8) it follows that:

$$1 + \rho > \frac{1}{\beta},$$

which by our assumption of $\beta(1 + r) = 1$ reduces to:

$$\rho > r.$$

By intuition, if households are faced with bad times, they would like to borrow or sell bonds to maintain their consumption constant, which they cannot do. Since the aggregate supply of bonds is zero, this means that that excess supply reduces the price, increasing *rho*.

Example III: Good times ($y_1 > y_2$)

Suppose the economy experiences "good times". Therefore, it follows that:

$$c_1 > c_2.$$

Then from Equation (8) it follows that:

$$1 + \rho < \frac{1}{\beta},$$

which by our assumption of $\beta(1 + r) = 1$ reduces to:

$$\rho < r.$$

By intuition, if households are faced with good times, they would like to lend or buy bonds to maintain their consumption constant, which they cannot do. Since the aggregate supply of bonds is zero, this means that that excess demand increases the price, reducing *rho*.

Intermediate cases

For bad times...

Perfect Capital Mobility

- Trade balance deficit
- Consumption remains constant

Financial Autarky

- No change in trade balance
- Domestic interest rate increases
- Consumption in period 1 decreases

Reality

- Trade balance deficit (based on degree of openness)
- Domestic interest rate increases
- Consumption decreases