

Econ4330 Spring 2014 Solution Guide

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A Exchange rates

Source: Rødseth: OEM Ch. 2

1. See pages 40 - 43 in text
2. The expression is

$$F_* = \left[1 + \frac{\sigma_{ep_*}}{\sigma_{ee}} - \frac{i - i_* - \mu_e}{R\sigma_{ee}} \right] [F_{*0} + (B_{*0}/E)]$$

One way of deriving it is to first find the portfolio share for domestic currency for a domestic investor and then write down the foreign analog, taking account of that that the exchange rate is still measured from the home point of view.

3. See pages 42-44
4. Main point is the portfolio balance effect. Assuming that investors in both countries have positive holdings of both currencies, then a marginal increase in E reduces the share of domestic currency in their portfolios. In order to get back to the optimal shares, they want to sell foreign currency and buy domestic currency, which means that their demand for foreign currency goes down. More formally, we can write the sum of the two demand functions in condensed form as:

$$F^D = f[F_0 + B_0/E] + f_*[F_{*0} + B_{*0}/E]$$

The derivative is

$$\frac{dF^D}{dE} = -fB_0E^{-2} - f_*B_{*0}E^{-2}$$

negative if investors has positive holdings of all assets. May be positive if some investors have large speculative position (positive in one currency, negative in the another).

5. Expectations and perceptions of risk may depend on the exchange rate. Different investors may have different expectations. Slope may depend on the joint distribution of beliefs and wealth. Capital controls.

B Open economy OLG

Source: Obstfeld-Rogoff Chapter 3 (Also Rødseth Note)

1. a) Use Lagrange's method to derive 1.o. cond.. Express consumption in periods 2 and 3 as multiples of consumption in period 1; insert in budget equation and solve this for C_1 . Or equivalent. b) Consumers prefer a consumption path which is high up, smooth, and tilts downward $\beta < 1$ (impatience). A positive interest rate means that an upward tilt gives a higher average. When $\beta = 1/(1+r)$, impatience and the reward for waiting balance each other and the consumer then prefers a constant consumption. The numerator in (2) is the present value of lifetime income, and if we multiply with the denominator on both sides, the equation says that the present values of consumption and income should be equal.
2. Saving is income minus consumption. $S_{t+1}^M = r(w_t - c_t) + w_{t+1} - c_t$. The accumulated assets at the end of $t+1$ are $A_{t+2}^O = (1+r)(w_t - c_t) + w_{t+1} - c_t$. After interest has been added next period, this should increase to

$$(1+r)^2(w_t - c_t) + (1+r)(w_{t+1} - c_t)$$

The saving in the third period (not asked for) is

$$rA_{t+2}^O - c_t = r(1+r)(w_t - c_t) + r(w_{t+1} - c_t) - c_t < 0$$

3. First order conditions for profit maximum are

$$\alpha(L_t/K_t)^{1-\alpha} = r \tag{11}$$

$$(1-\alpha)(L_t/K_t)^{-\alpha} = w_t \tag{12}$$

Since L_t is constant, (11) means that K_t is constant, and investment is zero. (12) then means w_t is also constant.

4. The current account surplus is the difference between saving and investment. With constant wages and constant population the dissaving of the old should be equal to the saving of the young and the middle-aged. This can be proved by adding the savings of one young, one middle-aged and one old from question 2 with w constant and using that the budget constraint is satisfied with equality.
5. The labor force increases from $2N$ in period $t-1$ to $2N+M$ in period t to $2N+2M$ in period $t+1$ and then stays constant. Let L_0 , K_0 and w_0 be the values that prevail before period t . Then $K_t = K_0$ since it is determined beforehand. L_t/K_t goes up $w_t < w_0$ down, see (12). (11) implies that firms optimal capital-labor ratio is independent of the size of the economy. If firms have sufficient foresight, they will invest enough in period t to bring K_{t+1}/L_{t+1} back to its old level. The required investment is $I_t = 2M(K_0/L_0)$. This brings w back to w_0 .

6. Because of the lower wage in period t both the young and the middle aged get lower life-time incomes and save less per capita. The young natives smooth consumption over 3 periods. This means the reduction in consumption in period t is smaller than the reduction in wage income. Savings are down (If the interest rate is low, the reduction in saving is close to $2/3$ of the reduction in wage income). The middle-aged can only smooth consumption over the two remaining periods. Hence, they cut consumption more and savings go down less (close to one half of the lost income if r is low). The old are unaffected by the decline in wages and dissave as before.
7. Saving of the natives are down and investments are up, pointing towards a current-account deficit. However, all the immigrants are young savers, which points in the opposite direction. With Cobb-Douglas the total-wage bill increases when labor supply goes up. This would have ensured more saving if all had the same savings rate. It is possible to get further by mathematical analysis or by rough calibration)
8. Wage rates and capital stock are normalized in period $t + 1$. Low wages when young will affect generation t for the rest of its life, that is to $t + 2$. everything is back to normal in $t + 3$.

C Capital movements

Advantages; Consumption smoothing. risk sharing, more efficiency in investment. Data: Rate of return differences, consumption correlations, correlations of investment and saving.