

Department of Economics, University of Maryland
International Finance (Econ 741)
Prof. Carlos A. Végh
Fall 2008

MIDTERM

This is a two-and-a-half hour, closed-book exam. The points corresponding to each question (which add up to 150 points) are indicated in parentheses. (Please make sure that you explain the intuition behind all your results.)

1 True, false, or uncertain (25 points)

Indicate whether you consider each of the following statements to be TRUE, FALSE, OR UNCERTAIN. In each case, give a *brief* explanation of your answer. *Your grade will depend heavily on your explanation.*

1. If we add a labor/leisure choice to the model of Handout # 1A with a production function given by $y_t = A_t(1 - \ell_t)$ (where y is output, A is a productivity parameter and ℓ is leisure) and characterize a perfect foresight equilibrium path with a non-constant path of A_t , consumption smoothing will not obtain.
2. Intertemporal *price* speculation implies constant consumption over time but fluctuating stock of durable goods.
3. In a simple endowment economy model with separable preferences over tradables and non-tradables, an increase in government spending of non-traded goods will leave the relative price of non-tradable goods unchanged.
4. In a small open economy with no access to international capital markets, permanent changes in output will cause changes in domestic real interest rates.
5. In models with uncertainty à la Handout # 2, certainty equivalence implies that welfare is the same as if there were no uncertainty.

2 Demand shocks with linear production (75 points)

This exercise looks at a variation of Handout # 4 in which production is linear in both sectors and asks you to solve for (i) an unanticipated and permanent demand shock and (ii) an unanticipated and temporary demand shock.

- Preferences are given by:

$$\int_0^{\infty} \alpha_t [\log(c_t^T) + \log(c_t^N)] e^{-\beta t} dt,$$

where c^T is consumption of tradables, c^N is consumption of non-tradables, α_t is a preference parameter and $\beta (= r)$ is the discount rate.

- Production of tradables and non-tradables, respectively, is given by:

$$\begin{aligned} y_t^T &= Z^T n_t^T, \\ y_t^N &= Z^N n_t^N, \end{aligned}$$

where Z^T and Z^N are positive productivity parameters, and n_t^T and n_t^N are labor used in the tradables and non-tradable goods sector, respectively.

- Labor supply constraint:

$$\bar{n} = n_t^T + n_t^N,$$

where \bar{n} is the exogenously-given supply of labor.

- Household's flow constraint:

$$\dot{b}_t = r b_t + y_t^T + p_t y_t^N - c_t^T - p_t c_t^N.$$

(If you need to use the corresponding intertemporal constraint, just state it without deriving it.)

In the context of this model:

1. Derive the first-order conditions and explain their intuitive meaning.

2. Consider a perfect foresight equilibrium path (PFEP) along which all exogenous variables are constant. Show that all endogenous variables will be constant as well.
3. Derive reduced-forms (i.e., express all endogenous variables in terms of exogenous variables) for all endogenous variables along the PFEP derived in 2 above.
4. Suppose that just before $t = 0$ the economy is in the PFEP characterized above. At $t = 0$, there is an unanticipated and *permanent* increase in α . Derive the response of all endogenous variables and explain the intuition behind your results.
5. Suppose, again, that just before $t = 0$ the economy is in the PFEP characterized above. At $t = 0$, there is an unanticipated and *temporary* increase in α . Derive the response of all endogenous variables and explain the intuition behind your results. Make sure that you plot the time path of all endogenous variables.
6. How do these results compared to those of Handout # 4? If appropriate, explain why any differences arise.

2.1 Determination of domestic real interest rates in financial autarky (50 points)

Set-up a two-period model of a two-good (tradables and non-tradables) real economy in *financial autarky*. Specifically, let preferences be given by (same notation as in the previous exercise):

$$U = \alpha_1 [\log(c_1^T) + \log(c_1^N)] + \beta \alpha_2 [\log(c_2^T) + \log(c_2^N)] ,$$

where α_1 and α_2 are preferences parameters. Denote by ρ the domestic real interest rate in terms of *tradable* goods and by ρ^N the real interest rate in terms of *non-tradable* goods. (Notice that you will have to define ρ^N when appropriate.)

In this context:

1. State the appropriate household's budget constraint/constraints for this problem.

2. Derive the first-order conditions.
3. Suppose the endowment of either good is the same in the two periods; that is

$$\begin{aligned}y_1^T &= y_2^T, \\y_1^N &= y_2^N.\end{aligned}$$

Show how ρ (domestic real interest rate in terms of tradable goods) depends on whether α_1 is greater, equal, or smaller than α_2 . Explain the intuition behind the results.

4. Suppose now that

$$\begin{aligned}\alpha_1 &= \alpha_2, \\y_1^T &= y_2^T.\end{aligned}$$

Show how ρ^N (domestic real interest rate in terms of non-tradable goods) depends on whether y_1^N is greater, equal, or smaller than y_2^N . Explain the intuition behind the results.