International macroeconomics (postgraduate course) 2011–2012 — Final exam

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23 January 2012

Surnames: _____

First name: _____

ID or passport number: _____

Question	Points	Obtained
1	40	
Total	40	

Instructions

Please do not read the questions until the professor allows you to do so.

All five questions have to be answered. Each question is worth 8 points, giving a **total of 40 points**.

Duration of the exam: **1 hour** (= 1.5 minutes per point or 12 minutes per question).

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1. (1) Consider the optimal portfolio model studied in class where an investor chooses between a safe asset with return $\bar{R}$ (let's say money, with $\mathrm{E}(\bar{R}) = \bar{\mu}$ and $\mathrm{Var}(\bar{R}) = 0$), a risky domestic bond with return R (with $\mathrm{E}(R) = \mu$ and $\mathrm{Var}(R) = \sigma^2$) and a risky foreign bond with return R^* (with $\mathrm{E}(R^*) = \mu^*$ and $\mathrm{Var}(R^*) = (\sigma^*)^2$). The correlation between R and R^* is equal to ρ. We suppose that $\mu > \bar{\mu}$ and $\mu^* > \bar{\mu}$. The total return of the portfolio is:

$$R^T = wWR + w^*WR^* + (1 - w - w^*)W\bar{R}. \tag{1}$$

a) Calculate the expected return of the portfolio? [1]

b) Calculate the variance of the portfolio's total return? [2]

c) The optimal share of the domestic asset held by the investor turns out to be: [3]

$$w = \frac{(\mu - \bar{\mu}) - (\mu^* - \bar{\mu})\frac{\sigma}{\sigma^*}\rho}{\lambda\sigma^2(1 - \rho^2)W}. \tag{2}$$

As the world's financial markets become ever more integrated, shocks to individual markets become more and more "contagious" and thus lead to similar effects across markets. What does this imply for the investor's demand of the risky domestic bond?

d) Does short-selling of assets become more likely or less likely when there is financial contagion. Explain briefly. [2]

Total of question 1: [40]

(2) Consider the monetary model with fixed prices. Indicate using arrows what would happen if, starting from an initial equilibrium, the foreign money supply would rise by δ in the short run and in the long run; that is, $m_1^* = m_2^* = m_0^* + \delta$. [8]

$$s_1 = -p_1 + p_1^* + q_1, \tag{3}$$

$$m_1 - p_1 = ay_1 - bR_1, \tag{4}$$

$$m_1^* - p_1^* = ay_1^* - bR_1^*, \tag{5}$$

$$R_1 = R_1^* + s_1 - s_1^e, \tag{6}$$

$$s_1^e = s_2, \tag{7}$$

$$s_2 = -p_2 + p_2^* + q_2, \tag{8}$$

$$m_2 - p_2 = ay_2 - bR_2, \tag{9}$$

$$m_2^* - p_2^* = ay_2^* - bR_2^*, \tag{10}$$

$$R_2 = R_2^* + s_2 - s_2^e, \tag{11}$$

$$s_2^e = s_2. \tag{12}$$

Total of question 1: [40]

(3) A Big Mac costs 4.20 dollar in the United States and 14.70 yuan in China. The bilateral exchange rate is 7.00 yuan per dollar. Is the Chinese yuan undervalued? Discuss (being explicit about your assumptions). [8]

Total of question 1: [40]

(4) a) Derive the following approximation of the real interest rate: $r \approx R - \pi$. [2]

b) Show that the equation $r = r^*$ and the uncovered interest parity relation are equivalent (under a suitable assumption, see part c of this question). [4]

c) Which assumption has to be fulfilled in order to be able to establish the equivalence between $r = r^*$ and the uncovered interest parity relation in part b of this question. [2]

Total of question 1: [40]

(5) In its efforts to contain the budget deficit, the new Spanish government has decided to increase the income tax IRPF. Critics argue that higher personal taxes reduce people's desire to consume, thereby reducing aggregate spending and making the crisis even worse. Based on the theory of Ricardian equivalence, what can you say about the validity of this argument. [8]

Total of question 1: [40]