

Brigham Young University Department of Economics
Economics 459 - International Monetary Theory
Dr. Phillips (section 1) Fall Semester 2007

Midterm Exam key

Due to the outstanding education you received at BYU, you have been hired by the Ministry of Economic Affairs in the small faroff country of Beluga. The Associate Deputy Vice-Minister for International Money and Finance, Dr. M. T. Microcephalid, a Ph. D. graduate of the University of Utah's economics department, knows virtually nothing about economics and has given you the responsibility of advising him. He has submitted 5 questions. Answer each one in the space provided, and remember that death is still an acceptable punishment in Beluga. The currency in Beluga is the bugle.

1. "I am going to lunch with a banker tomorrow and I want to impress him with my knowledge of international finance. I am planning on smuggling in a 3x5 card with some basic information. In the space provided below give me some of the basics on the market for foreign currencies. Where are the 4 biggest markets located? What are the main types of market suppliers and demanders? What are the major 'vehicle' currencies? What are 'vehicle' currencies, anyway?"

4 biggest markets: **London, New York, Tokyo, Singapore or Hong Kong**

Major participants: **Importers & Exporters, Speculators, Commercial Banks, Central Banks**

Vehicle currencies: **US \$, Euro, British £, Japanese Yen, Swiss Franc (any 4 is OK)**

A vehicle currency is... **a currency simultaneously bought and sold to facilitate the exchange of two other currencies which ordinarily are not bought and sold for each other.**

2. “OK, the Statistical division reports back the following linear regression you asked them for a few weeks ago. It is based on data over the past 10 years using 3-month forward rates for the bugle per dollar exchange rate.

$\varepsilon_t = \alpha + \beta\phi_{t-1} + u_t$; $\hat{\alpha} = .001$, $\hat{\beta} = -0.25$. I am told that alpha is not significantly different from zero, but that beta is significantly less than one.

Explain to me one more time what the e and f are and how I might use this information to make money. More specifically, the current 30-day forward rate is 155 bugles per dollar and the current spot rate is 150 bugles per dollar. Should I take a short or long position in US dollars? Explain your reasoning carefully so my accountant and broker will understand.”

ε' is the percentage change in the spot exchange rate between now and next period, that is $\ln s' - \ln s$. f is the forward exchange rate and ϕ is the forward premium, $\ln f - \ln s$.

The return on a short position is given by $\Delta = \ln f - \ln s = \phi - \varepsilon'$.

The expected return on a short position is therefore, $E\{\Delta\} = \phi - E\{\varepsilon'\}$.

From the regression we have $E\{\varepsilon'\} = .001 - .25\phi$.

So the expected return on a short is $E\{\Delta\} = \phi - .001 + .25\phi = 1.25\phi - .001$

In our case the forward premium is $\phi = \ln 155 - \ln 150 = .0328$, so the expected return on a short position in dollars is $E\{\Delta\} = 1.25(.0328) - .001 = .0397$ or 3.97%. Take a short position in dollars and you should expect to earn almost 4% on the position when it comes due.

3. “Here are the figures from this morning’s edition of the Belugan Economic Journal with exchange and 30-day interest rate quotes:

Country	Currency	exchange rate	30-day interest rate (APR)
USA	dollar	150.0 bugles/\$	2.5%
Beluga	bugle	-	4.0%
Europe	euro	1.5 \$/€	2.0%

“My boss the Deputy Vice-Minister has a private savings account with a balance of 80,000,000 bugles. He has to wait for a month before he can cash out the account and would like to convert them to dollars when he does cash out. How many dollars can the Vice-Minister expect to receive when he cashes out in 30 days? How about if he converts this to Euro?

We need the forward rates for dollars and euro which we can deduce from the covered interest rate parity condition.

$$i - i^* = 12(\ln f - \ln s) \text{ or } \ln f = (i - i^*)/12 + \ln s$$

for US \$ first:

$$\ln f = (.040 - .025)/12 + \ln(150) = 5.1188, \text{ so } f = 150.1876$$

Hence 80 million bugles traded in 30 days at today’s forward rate gives 80 million / 150.1876 = \$532,667

For euro we also need the spot rate, but we have 150 b/\$ and 1.5\$/€ so we have 225 b/€.

$$\ln f = (.040 - .020)/12 + \ln(225) = 5.4178, \text{ so } f = 225.3753$$

Hence 80 million bugles traded in 30 days at today’s forward rate gives 80 million / 225.3753 = €354,963

4. “We were discussing last week your strange notion of a ‘risk premium’ and you wrote down some odd formula for the risk premium on an uncovered versus covered foreign investment. Could you please reproduce that formula here and then explain it in plain English so that I can try once more to understand this very difficult concept?.”

The formula is $\gamma \text{Cov}\{\varepsilon', \ln C\}$

γ is the coefficient of risk aversion, the greater it is the more risk averse investors are.

ε' is the percent appreciation in the spot rate between periods and $\ln C$ can be interpreted as the level of utility or the return on the market portfolio.

$\text{Cov}\{.,.\}$ is the covariance of the two random variables.

The formula says that the risk premium associated with the uncovered investment is bigger the degree of risk aversion and the more positively correlated the percent change in the spot rate is with overall utility. If it is positively correlated, then the COV term will be positive and since $\gamma > 0$, the risk premium will be positive also. If ε' and $\ln C$ are negatively correlated then the risk premium will be negative. In such a case the uncovered investment would be offering hedging or insurance.

5. “The neighboring country of Zalchistan, has a long-run growth rate roughly similar to ours, but Zalchistani goods are quite different from ours and not really very good substitutes. Currently our money supply is growing much less rapidly than theirs. Can you give me a long-run prediction for the path of the bugle vs zotney (Zalchistani currency) exchange rate. Be sure to explain your answer and provide reasoning from a well-accepted economic model. I promise I will give you credit when I brief the Minister next week!”

Use the equilibrium approach to exchange rates.

$$e = q\left\{\frac{Y^*}{Y}\right\} \frac{M}{M^*} \Lambda\left\{\frac{Y^*}{Y}, g_M - g_M^* - (1-k)(g_Y - g_Y^*) + \bar{\rho}\right\}$$

We have $g_Y = g_{Y^*}$ so that Y^*/Y remains roughly constant as does q .

However we have $g_M < g_{M^*}$ so the ratio M/M^* is falling. The long-run behavior of e is driven, therefore, by M/M^* and e should fall at a roughly constant rate over time.