

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

Final Exam key
June 18, 2007

This exam is closed book and closed notes, though you may use a calculator. Read all questions carefully before answering. Write your answers legibly in the space provided. Keep your answers concise and correct. Points will be deducted for answers which are irrelevant to the question. Each question is worth 20 points.

There has been a political shakeup in Beluga. The president has sacked his entire economic team due to widespread corruption and your former employer, Waimi Aiask, is in jail. The Ministry of Economic Affairs has hired a highly respected economist, Dr. M. T. Hedd, to help weed out the incompetent political appointees. All the staff members have been give the following set of questions to answer. If you can pass the test, you will keep your job. If you fail, then the newly appointed minister will naturally assume you were complicit in the widespread corruption under his predecessor. The consequences in that case would not be painless.

1. "Please list the major sub-accounts of the current account. Explain the effects of each of the following transactions on the appropriate sub-account(s), the current account as a whole, the two major divisions of the capital account, and the capital account as a whole. The IMF requires we report these numbers using US dollars and the current exchange rate is 140.0 bugles per dollar."

a) The government of Beluga receives a shipment of aid from the American Red Cross consisting of emergency medical supplies valued at \$500,000.

Imports rise move the current account in a negative direction by \$500,000
Unilateral transfers rise and move the current account in a positive direction by \$500,000
There is no net change in the current account and no action at all on the capital account.

b) The First National Bank of Beluga, trades \$45 million worth of deposits at Citibank on the New York foreign exchange market for Belugan bugles.

There is no action on the current account.
There is a decrease in domestic ownership of foreign assets moving the KA up by \$45 million
There is a decrease in foreign ownership of domestic assets moving the KA down by \$45 million
Hence, no net effect on the capital account (KA)

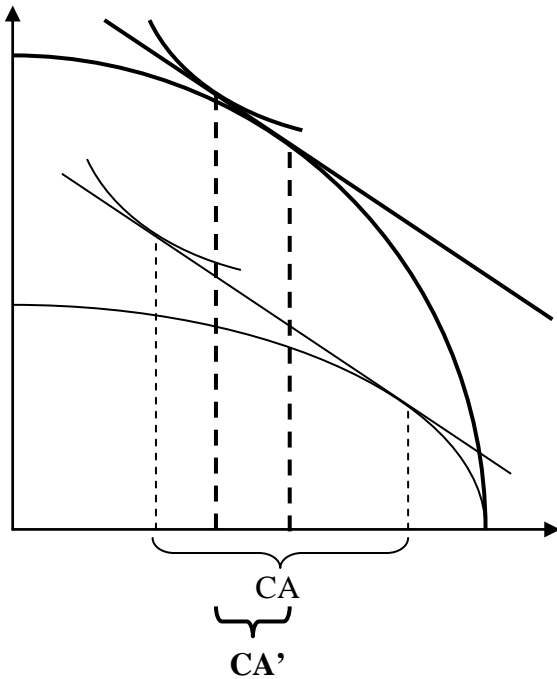
c) The Bubble-Bubble Beluga Gum Company (BBBGC) pays a \$1,200,000 bonus check to its CEO who is a citizen of Great Britain. The check is drawn on the Standard Chartered Bank in London.

Net Factor Income falls by \$1.2 million causing the current account to deteriorate by the same
There is a decrease in domestic ownership of foreign assets of \$1.2 million causing the capital account to improve by the same amount

d) Beluga Oil, the state-owned oil monopoly, exports \$3,000,000 worth of crude oil to Zalchistan and receives a payment of dollars transferred from a Swiss bank.

Exports rise by \$3 million and the current account improves by the same amount
There is an increase in domestic holdings of foreign assets of \$3 million causing the capital account to deteriorate by the same amount

2. “The current account forecast for 2007 for Beluga is a deficit of 600 billion bugles. Recent treaties with Japan and the European Union, mean that it will be much easier for Belugan companies to acquire superior technology from these countries. That should mean higher productivity in future years, even though it shouldn’t affect productivity this year. What effect will this have on our current account this year? Explain the intuition and use an appropriate graph. Remember, Beluga is a small country when it comes to savings and investment.”



Since Beluga is a small country the interest rate will not change. The increase in technology will shift the PPF up in a proportional manner, but since output today is not affected it has the same intercept with the X-axis.

Investment rises because technology increases raise the MPK and firms desire to increase the capital stock. Consumers receive less today, but enough more tomorrow that they are wealthier overall. They respond by increasing consumption today and decreasing savings.

The current account therefore will deteriorate since savings has fallen while investment rose.

3. “A recent publication by an internationally-respected professor at Brigham Young University in the United States reported the following relationship between the appreciation rate of the Belugan bugle and the forward premium over a 3-month horizon.

$$\varepsilon_{t+1} = .005 - .90\phi_t + u_{t+1}, \quad u_{t+1} \sim iid(0, \sigma_u^2)$$

(note this study was done in the US so the professor assumed the US dollar was the home currency and the bugle was the foreign currency)

Currently the spot rate is 140 bugles per dollar and the 3-month forward rate is 145 bugles per dollar. Should a US foreign currency speculator take a long or short position in bugles? Explain.”

The return on shorting the bugle is given by $\Delta_{t+1} \equiv \ln f_t - \ln s_{t+1} = \phi_t - \varepsilon_{t+1}$

Using the empirical relation above we get $\Delta_{t+1} = \phi_t - .005 + .90\phi_t - u_{t+1}$

Taking the expected value gives $E\{\Delta_{t+1}\} = 1.9\phi_t - .005$

The forward premium is given by $\phi_t = \ln f_t - \ln s_t = \ln(1/145) - \ln(1/140) = -.0351$

So the expected return on shorting the bugle is $E\{\Delta_{t+1}\} = 1.9(-.0351) - .005 = -.0717$

Hence, you would expect to lose 7.17% on every dollar you used shorting the bugle.

The return on taking a long position against the bugle is the negative of this, that is +7.17%, so a US investor should go long against bugles (that is bet the spot rate in 30 days will be higher than the current forward rate of (1/145) \$ per bugle.

4. “In recent years the economies of Beluga and Zalchistan have been growing at about the same rate of 3% per year. The money supply of Beluga has been growing at 5% per year. In Zalchistan the money supply has been growing more rapidly, but the central bank there has maintained a peg against the US dollar. Last month, the Zalchistani central bank devalued its currency against the dollar and abandoned the peg. They are apparently giving into pressure from the government to monetize the government’s budget deficit. Estimates are that the growth rate of the money supply there is close to 20% per year, much higher than in the past, and much higher than here in Beluga. What do you predict for the long-run behavior of the bugle per zotney (Zalchistan currency) exchange rate?”

We should use our long-run equilibrium approach to exchange rates.

$$e = q \frac{M}{M^*} \Lambda \left(E \left\{ \delta + g_M - g_Y - g_M^* + g_Y^*, \frac{Y^*}{Y} \right\} \right)$$

In the past g_Y and g_Y^* have been the same value and Y^*/Y has been constant, meaning q has been constant and δ (the % change in q) has been zero. These conditions have not changed.

In the past g_M^* was the same as in the US, but not necessarily the same as in our country of Beluga. Given this information alone we can’t say if the exchange rate has had a long-run upward trend or downward trend or stayed roughly constant.

However, we do know that g_M^* has risen dramatically. This will lead the first term in the L function to fall putting immediate pressure on the exchange rate (quoted as bugles per zotney) to fall. In addition, the ratio M/M^* will begin to fall rapidly.

Hence we predict in the long-run that it will take fewer and fewer bugles to buy a zotney.

5. “Explain how you could derive a formula for the current account using a general equilibrium model of a small open economy. You do not need to actually derive the formula, just explain how you would go about getting it. What are the three fundamental conditions of a general equilibrium? How would you use them in this context?”

The three fundamental conditions are:

- 1. Firms all maximize profits**
- 2. Consumers all maximize utility**
- 3. Markets all clear**

We could set up a model of consumption and production over time.

Firms maximizing the present value of profits would give us a demand for investment as a function of current output and undepreciated capital.

Consumer maximizing lifetime utility would give us demand for consumption in all periods. This would also give savings supply in each period.

With a small open economy we need only make sure that the interest rate the firms and households face is the same and equal to the world market interest rate.

The current account will be the difference between total savings and investment. Since both of these are functions of the interest rate, the current account is also a function of the world market interest rate. It would also be a function of current output and undepreciated capital, and the parameters of the households’ utility function and the firms’ production function.