

## Problem Set 1

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**Due:** Thu, August 14, before 2:00pm

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### 1 Finance and Trade Perspectives on the Current Account

Current account imbalances can be interpreted with a perspective on commodity trade or on financial transactions. For our purposes,  $CA = EX - IM$ . Using the result that  $S = S^P + S^G = I + CA$ , show that  $CA = S^P - I + (T - G)$  is also true.

- Since 2003, Singapore is running both a fiscal surplus and a current account surplus. Use suitable interpretations of the current account to explain how one could give rise to the other. Converting Singapore's fiscal surplus into USD, infer the difference between private savings and investment in Singapore for 2003, 2004 and 2005.
- Ireland exhibits considerably smaller GNI than GDP. Infer the difference in Euros for the years 1999 through 2004. Which of the two series grows faster? What explains this difference? Can you infer whether foreigners or domestic residents raised their incomes faster?
- During the 1990s, private household debt in the United States has been growing at a faster rate than US economic output, while the ratio of household debt to equity rose from 84% to 105% between 1990 and 2000. At the same time, government deficits prevailed except for a short period in the late 1990s. Do you think raising tariffs would have reduced the value of US net imports? Would tariffs have reduced the volume of net imports?

*Data.* Visit <http://elibrary-data.imf.org/> and obtain the current account and fiscal surplus for Singapore in 2003, 2004 and 2005. From the box 'Query within a Dataset', select *International Financial Statistics (IFS)*. The Query Builder then offers four items to limit your search: under Country (Countries and Entities) check the box next to 'Singapore'; under Concept (Economic Sector—Balance of Payments—...) check the box for 'Current Account (Excludes Exceptional Financing), Net' to obtain the current account and under Concept (Economic Sector—Government and Public Sector Finance—...) check the box for 'Cash surplus/deficit, Cash' to obtain the fiscal surplus; under Time select the period 200-2005. Click the button 'View data →' to display the data on the screen, then download the data into a spreadsheet file by hitting the according icon in the top right corner of the screen. Repeat similar steps for Irish data.

## 2 An $N$ -country World

Think of a world with  $N$  countries, each with its own currency. How many bilateral exchange rates are there? (You may try working your way up from  $n = 1, 2, \dots$  to  $n = N$ .) How many current accounts can clear independently? So, how many independent exchange rates can there be?

In this light, how would you characterize the dollar under the Bretton Woods system? Does this characterization help explain the external balance problem of the United States and the Triffin Dilemma? Why or why not?

## 3 Spread of the Great Depression

About a third of all US banks failed during the onset of the Great Depression between 1929 and 1933, wiping out around a quarter of the US money in circulation (M1). Most major economies were back on a gold standard by that time. If the central banks in those countries adhered to the rules of the game, how would the monetary contraction in one country spread to other countries? If central banks did not adhere to the rules of the game, what would be the current account response under the price-specie-flow mechanism?

## 4 The Transfer Problem

Think of a world with two countries D and R under a fixed exchange rate regime. (You may consider an international gold standard, for instance, where the price-specie-flow mechanism is at work.) Country D (donor) surprisingly transfers income  $Y$  (not gold) to country R (recipient). Examples of such transfers are sharp increases in oil prices and subsequent income transfers to oil exporters, foreign aid, or war reparations.

What is the likely current account response after the transfer? There are two cases that caused much controversy: (i) As Keynes stressed, R may try to use the transfer to consume mostly domestic goods. (ii) As Ohlin countered, R may try to use the transfer to demand mostly imports from D. Does the distinction matter for the value of the current account response? Does the distinction matter for the trade volume response?

*Hint.* To determine the current account value, consider what the income transfer means for savings and investment. You may disregard the price-specie-flow mechanism.

## 5 Theory and Empirics of Interest Parity

State the uncovered and the covered interest parity conditions.

1. Why is uncovered interest parity called uncovered? Does it have to hold? What assumptions are needed? How does it compare to covered interest parity?
2. The USD 3-month deposit (interest) rate and the GBP 3-month deposit rate are both 5.0%. What is the relationship between the current equilibrium USD/GBP exchange rate and its expected future level? Assume the expected USD/GBP exchange rate three months into the future remains constant at USD 1.50 per GBP. But the GBP 3-month deposit rate doubles to 10.0%. What is the new spot USD/GBP exchange rate in equilibrium?
3. Plot the difference between the USA 3-Month Certificate Of Deposit Rate and the UK 3-month Sterling Time Deposit Rate from January 1, 2001 to March 31, 2010. What do you observe? Now plot the expected exchange rate change  $(E^e - E)/E$  at the three month horizon for the USD/GBP exchange rate, assuming that investors have perfect foresight so that the expected exchange rate equals the future realized spot rate. Does Uncovered Interest Parity seem to be satisfied in the data? Describe the steps you would have to take to check for covered interest parity in the data.

You may choose not to print the graphs. In that case, draw the stylized figures for your answer.

*Data.* Visit <https://www.globalfinancialdata.com/> and display graphs on your screen (using monthly frequency for 2001-2010) with the UK 3-month Sterling Time Deposit Rate (symbol: ICGBR3D), the USA 3-Month Certificate Of Deposit Rate (symbol: ICUSAT3D), the USD/GBP exchange rate (symbol: GBPUSD). (You do not need the USD/GBP 3-month Forward Rate (symbol: GBPUSD3D) but may find it instructive to display.) To view a series, enter the according symbol in the “GFD AutoSearch” field in the upper left-hand corner. You may want to download the series into three separate spreadsheets, then copy and paste the US and UK deposit rates into one spreadsheet, and copy and paste the US/GBP 3-month Forward Rate into another spreadsheet. To plot the difference between the US and UK deposit rates in Excel, you can subtract the UK series from the US series directly and then plot the resulting series by highlighting it and clicking the “Chart Wizard” button on the Excel toolbar. Select a line chart and then click the “Next” button. In the following window, select the “Series” tab and use the series of dates in the left column as the “Category (X) axis labels”. To plot the expected exchange rate change at the three month horizon, create a new series according to the given formula (e.g. if the first exchange rate observation is in cell B2 in Excel, you could use the formula “=(B3-B2)/B2” for the current cell on line 3).

## 6 Money Supply and the Exchange Rate

The Federal Reserve System increases aggregate money supply permanently. Use diagrams showing the exchange rate, the expected currency returns and money holdings to analyze the *short-term* and the *long-term* effects on the USD interest rate, the US price level and the nominal exchange rate.

## 7 Output Fluctuations and the Exchange Rate

Domestic real GNP increases temporarily but expectations of future exchange rates are unchanged. Use diagrams showing the exchange rate, the expected currency returns and money holdings to analyze the *short-term* and the *long-term* effects on the USD interest rate, the US price level and the nominal exchange rate.

## 8 Short-term Output Effects

Suppose that a *permanent* increase in money supply boosts domestic real GNP *temporarily*. What effect does this have on aggregate real money demand in the short term? How does the exchange rate respond at the moment of the increase in money supply? Use diagrams showing the exchange rate, the expected currency returns and money holdings to analyze the possibility of exchange rate undershooting. Do you consider undershooting realistic?