

Answer to First Test

1. Consider the following balance sheet for a commercial bank:

Assets	Liabilities
Loans to households and businesses Safe, liquid government bonds	Deposits Net Worth

- a. (4pts) Under what conditions would this bank be bankrupt or insolvent? (Here, I am looking for an inequality that uses the items on the bank's balance sheet.)

Answer: Loans to households and businesses + Safe, liquid government bonds < Deposits, or Net worth < 0.

- b. (4pts) Assume the “fire sale” value of the loans to households and businesses is less than their market value in normal times. Under what conditions would this bank be illiquid?

Answer: The “fire sale” value of the loans to households and businesses + Safe, liquid government bonds < Deposits.

- c. (4pts) Suppose that the loans pay an interest rate of r , and save government bonds pay an interest rate of $i < r$. Assume there is no uncertainty about either return. However, the bank must liquidate all loans at the end of the period, which is costly. We assume the cost of liquidating the loans increases in the number of loans.

So the true marginal rate of return on the loans is $r - a \frac{L}{D}$, where L is the amount of loans the bank makes, and $D > 0$ is the exogenously given amount of deposits, and $a > 0$ is a constant. The term $a \frac{L}{D}$ represents the cost of liquidating the loans.

The bank will make loans as long as the true marginal rate of return is greater than i . What level of loans will they make?

Answer: There are two options for the bank. One is to make loans and the other is to save government bonds. As long as the true marginal rate of return is greater than i , it will be more profitable for the bank to increase the loans. Since the bank's true marginal return decreases in loans, there is the level of loans at which the true marginal return equals the interest on government bonds. At this level of loans, the bank is indifferent between making loans and

holding government bonds. The bank will never make more loans than this level since once it adds more, the true return on loans is lower than the interest on government bond so that it is more profitable for the bank to invest in government bonds. Thus, the bank will make loans until

$$r - a \frac{L^*}{D} = i \quad \Rightarrow \quad L^* = \frac{D(r-i)}{a}.$$

2. In two or three sentences, define each of these terms:

a. (4pts) Credit default swap

Answer: A credit default swap is a financial swap agreement that the seller of the CDS will compensate the buyer in the event of a debt default (by the debtor) or other credit event such as the loss of asset value. That is, the seller of the CDS insures the buyer against some reference asset defaulting.

b. (4pts) Asset backed security

Answer: An asset backed security is a financial security collateralized by a pool of assets such as loans, leases, credit card debt, royalties or receivables. This allows the risk of investing in the underlying assets to be diversified because each security will represent a fraction of the total value of the diversified pool of underlying assets.

c. (4pts) Repurchase agreement

Answer: A repurchase agreement is a form of short-term borrowing, mainly in government securities. The dealer sells the underlying security to investors and buys them back shortly afterwards, usually the following day, at a slightly higher price. This could be considered as short-term “collateralized” loans.

3.a. (3pts) If a country is near to defaulting on its government debt, which international agency can they go to for an emergency loan?

Answer: International Monetary Fund (IMF)

b. (3pts) Which international agency specializes in lending to developing countries for longer term projects such as infrastructure investment?

Answer: World Bank

c. (3pts) Which international agency manages the reserves of central banks of developing countries and provides a forum for developing international norms for banking regulation?

Answer: Bank for International Settlements (BIS)

d. (3pts) Rank these countries in order of most open capital markets to least open: Brazil, China, United States.

Answer: United States - Brazil - China

4.a. (3pts) The current dollar price of a euro is approximately \$1.1338, and the current euro price of a dollar is approximately 0.8820. From an American standpoint, which of these is a direct quote and which is an indirect quote?

Answer: Direct quote - \$1.1338, Indirect quote - €0.8820

b. (3pts) Your bank quotes a bid rate and an ask rate for the dollar price of Swiss francs. The quotes are \$0.9990 and \$0.9986. Which is the bid rate, and which is the ask rate?

Answer: Bid rate - \$0.9986, Ask rate - \$0.9990

c. (3pts) If you want to buy Swiss francs from your bank, which rate will you pay?

Answer: If I want to buy Swiss francs from the bank, the bank will sell me Swiss francs and apply the ask rate. Thus it will be \$0.9990.

d. (3pts) The bank also has a bid rate and an ask rate at which a customer could either buy dollars for Swiss francs or sell dollars for Swiss francs. It quotes those Swiss franc per dollar prices as CHF $\frac{1}{0.9990}$ and CHF $\frac{1}{0.9986}$. Which is the bid rate for the Swiss franc per dollar exchange rate, and which is the ask rate?

Answer: Bid rate - CHF $\frac{1}{0.9990}$, Ask rate - CHF $\frac{1}{0.9986}$

5.a. (3pts) Suppose the current dollar per U.K. pound exchange rate is denoted by S_t and the spot exchange rate next period is S_{t+1} . If $S_{t+1} > S_t$, do we say the dollar depreciates or appreciates?

Answer: Since the dollar price of U.K. pound will increase next period, the dollar loses the value and U.K. pound gains more value. Thus, the dollar depreciates.

b. (4pts) What is the exact formula and the approximate formula for the percentage change in the dollar per U.K. pound exchange rate?

Answer: The exact formula for the percentage change in the dollar per U.K. pound exchange rate is $100 \times \frac{S_{t+1} - S_t}{S_t} \%$. Using the natural log, we could approximate the growth rate as $100 \times (\ln(S_{t+1}) - \ln(S_t))\%$.

c. (4pts) Suppose the current U.S. dollar price of a Canadian dollar is \$1.02. We know that the mean or average rate of appreciation of the U.S. dollar to the Canadian dollar is 3% per year, and one standard deviation is 4%. What is the 95.45% range that we expect the price of Canadian dollars to be within one year from now. (Because you don't have calculators, all I am asking for is an approximate answer.)

Answer: Let $S_t = \$1.02$ and S_{t+1} be the next year exchange rate. Given today's exchange rate, the expected value of S_{t+1} is $E_t[S_{t+1}] = S_t (1 + E_t[\frac{S_{t+1} - S_t}{S_t}]) = 1.02 \times (1 - 0.03) = 0.9894$, and the standard deviation of S_{t+1} is $\sigma_t[S_{t+1}] = S_t \sigma_t[\frac{S_{t+1} - S_t}{S_t}] = 1.02 \times 0.04 = 0.0408$. For a Normal distribution, 95.45% of the probability distribution is within plus or minus two standard deviations of its mean value. Thus, if we assume the growth rate of the exchange rate follows a Normal distribution, the 95.45% range of the price of Canadian dollars is from $0.9894 - 2 \times 0.0408 = 0.9078$ to $0.9894 + 2 \times 0.0408 = 1.071$.

Approximately, we can say that the expected U.S. dollar price of a Canadian dollar is \$0.99. That is, a three percent appreciation of the U.S. dollar would make Canadian dollars approximately three cents cheaper. The 95.45% range is plus or minus 2 standard deviations, so we expect the actual price to fall within plus or minus 8 percent of \$0.99. That is, the 95.45% range is \$0.91 to \$1.07.

6. Suppose that the Japanese yen per dollar swap is quoted as ¥/\$ 100.10 (bid) - .20 (ask), and the 30-day swap points are 15 (bid) / 30 (ask).

a. (4pts) If you have yen and want to buy dollars from the dealer on the spot market, and sell the dollars back for yen at the 30-day forward rate, what price do you pay for dollars on the spot market? How many yen do you receive for each dollar when you contract to sell the dollars back on the forward market?

Answer: Spot rate - ¥100.20 (ask), Forward rate - ¥100.25 (bid)

b. (2pts) Going the other way, suppose you had dollars and wanted to buy yen on the spot market and swap them back for dollars after 30 days. How many yen would you get for each dollar on the spot market? How many yen would you pay for a dollar on the forward market?

Answer: Spot rate - ¥100.10 (bid), Forward rate - ¥100.5 (ask)

7. (8pts) What are the four definitions of the current account that were emphasized in lecture?

Answer: 1) $CA = \text{Net export of Goods/Services} + \text{Net Investment Income} + \text{Net Unilateral transfer}$

2) $CA = \text{Gross National Income} - \text{National Expenditure}$

3) $CA = \text{Change in net foreign assets} (= - \text{Capital Account})$

4) $CA = \text{National Saving} - \text{National Investment}$

8. For each of the following transactions, say which U.S. account the transaction is recorded on the financial account (FA), current account trade balance (CATB), or current account income balance (CAIB). Say whether the transaction is a debit or credit for the U.S.

a. (4pts) (1) An American tourist visits Bangkok and purchases a plate of pad thai.

(2) The tourist pays with Thai baht.

Answer: (1) CATB - debit, (2) FA - credit

b. (4pts) (1) An American buys shares in a Swiss company.

(2) The American pays with a bank transfer.

Answer: (1) FA - debit, (2) FA - credit

c. (4pts) (1) A Japanese investor receives interest from a U.S. Treasury bond.

(2) The U.S. pays the interest with a bank transfer.

Answer: (1) CAIB - debit, (2) FA - credit

d. (4pts) (1) The U.S. sells medical equipment to Mexico.

(2) The exporter is paid with a bank transfer.

Answer: (1) CATB – credit, (2) FA - debit

9. There is pressure for the Indonesian rupiah to appreciate. The private demand for rupiah, coming from foreigners wanting to buy rupiah to buy Indonesia's exports and to buy Indonesian assets. The demand for rupiah exceeds the supply coming from the private sector in Indonesia.

a. (4pts) The central bank undertakes an action to keep the rupiah from appreciating. In doing so, how is the asset side of the central bank balance sheet changed?

Answer: To keep the rupiah from appreciating, the central bank supplies rupiah and buys foreign currency. With this foreign currency in hand, it would buy interest-bearing foreign government bonds. Thus, the official international reserve in asset side will increase.

b. (4pts) Is the official reserves transactions account balance in surplus or deficit for Indonesia?

Answer: Since the central bank increases its holdings of foreign assets, the official reserve account is in deficit.

c. (3pts) Is the “balance of payments” in surplus or deficit for Indonesia?

Answer: The “balance of payments” is in surplus since the “balance of payments” = - official reserves account.