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## Introductory Macroeconomics

### Homework 3: Open Economy

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1. T/F. A country with a current account deficit must be borrowing from the rest of the world.
2. T/F. An appreciation of the domestic currency makes exports more expensive for foreigners.
3. T/F. Under a fixed exchange rate system, the central bank commits to keeping the exchange rate at a target level.
4. T/F. The financial account records transactions in real goods and services.
5. T/F. Under the gold standard, countries could freely convert currency into gold at a fixed price.
6. (Hubbard & O'Brien 5.3) In 2018 national saving in Korea equaled 34.9% of GDP, and domestic investment equaled 30.2% of GDP.
  - (a) Calculate net foreign investment in Korea as a percentage of GDP.
  - (b) Can we say with certainty whether in 2018 the Korean government was running a surplus or a deficit? Briefly explain.
  - (c) Can we say with certainty whether Korea was running a trade surplus or a trade deficit? Briefly explain.
7. The following table shows the price of a phone in different countries and the current exchange rate against the US dollar. As an example the 6.5 nominal exchange rate for Israel is expressed as NIS per US dollar.

Country	Price	Currency	Nominal E	Real E
Israel	4800	NIS	6.5	
US	720	USD	1	
Hong Kong	6200	HKD	8	
UK	575	GBP	0.8	
France	800	EUR	0.95	

- (a) Translate all the prices to US dollars. Where is the most expensive phone located.
- (b) Find the real exchange rate.
- (c) Find the PPP implied nominal exchange rates, assuming phones are the only goods there are in the world.
- (d) Classify each currency as undervalued or overvalued relative to the US dollar.

Complete the following table. But now the nominal exchange rate is expressed per Euro, so from the point of view of France.

- (e) Repeat (a)-(d) but translating into Euro and making comparisons against France.

8. Derive the identity  $S = I + NFI$ . Your starting point should be the equation  $Y = C + I + G + NX$ . Make sure you explicitly state every definition and result you use along the way.

Country	Price	Currency	Nominal E	Real E
Israel	4800	NIS		
US	720	USD		
Hong Kong	6200	HKD		
UK	575	GBP		
France	800	EUR		

9. Nominal GDP and its components for the US is given below in billions.

$$C = 19,896, \quad I = 5,259.3, \quad G = 5,041.1, \quad NX = -898.5$$

- Calculate national savings  $S$  and net foreign investment  $NFI$ .
- Does the US have a trade deficit or trade surplus?
- Is the US a net borrower or net lender in this year? Why?
- If investment stayed the same but the trade balance were zero, what must happen to national savings?

10. From Table 1 of [BEA's release of international transactions](#). Focus on 2024.

- Find the difference between exports of goods & services and imports of goods & services.
- Find the difference between primary income receipts and primary income payments.
- Find the difference between secondary income receipts and secondary income payments.

Add the answers in parts (a), (b), and (c). This is the current account. Your answer should match that of line 109.

- Find the balance of the capital account. Line 115.
- Find the balance of the financial account. Line 117.
- The balance of payments always equals 0, find the statistical discrepancy.

11-15. (Hubbard & O'Brien D28.6) Go to the Federal Reserve Economic Data (FRED) [website](#) and find monthly data on the trade weighted exchange rate for the U.S. dollar against major currencies (TWEXMMTH) from 2016 to 2020. Convert the monthly data into quarterly percentage changes by clicking on "Edit Graph" and "Modify frequency" to "Quarterly" and by changing "Units" to "Percentage Change from Year Ago." Note that a higher index value denotes a stronger U.S. dollar. Also find quarterly data on the U.S. current account (IEABC) from 2016 to 2020.

- Briefly explain what a trade weighted exchange rate is. Also briefly explain what the current account is.
- Plot the two series in the same graph. Make sure labels are easy to understand. Plot the evolution of the dollar on the left axis and the evolution of the current account on the right axis. To change the axis, click on "Edit Graph", "Format", and customize each of the lines.
- In the fourth quarter of 2016, did the U.S. dollar appreciate against the other major currencies? In the same quarter, did the U.S. current account increase or decrease relative to the previous year?
- In the third quarter and fourth quarter of 2018, did the U.S. trade-weighted exchange increase or decrease? During the same period, did the U.S. current account increase or decrease?
- Are your results in parts (c) and (d) consistent with the theory presented in class? Briefly explain. Explain in terms of the appreciation/depreciation of the domestic currency and its relationship with the current account balance.