

Chapter 11 Purchasing Power Parity

Quiz

True-False Questions

- _____ 1. CPP says that you can make a risk-free profit by buying and selling goods across countries.
- _____ 2. CPP implies causality. It states that foreign prices are determined by domestic prices and other factors such as production costs, competitive conditions, money supplies and inflation rates.
- _____ 3. In order for a firm not to be affected by real exchange risk, CPP must hold not only for the goods a firm produces but also for all production inputs, and for the prices of complementary and substitute goods.
- _____ 4. The equilibrium exchange rate put forward by the Absolute Purchasing Power Parity hypothesis is the ratio of the prices of a representative consumption bundle in the currencies of two countries.
- _____ 5. Your purchasing power is the number of representative consumption bundles that you can buy.
- _____ 6. The real effective exchange rate is the price of an average foreign consumption bundle in units of domestic currency.
- _____ 7. Relative PPP shows how a consumer's purchasing power changes over time.
- _____ 8. Absolute PPP may hold even when relative PPP does not because Absolute PPP looks at levels at a specific point in time, and levels are always comparable, regardless of the composition of the consumption bundle.
- _____ 9. Given the empirical evidence on the correlation between the nominal and real exchange rate, it is possible to use the nominal financial instruments to hedge real exchange risk.
- _____ 10. Purchasing Power Parity is based on the idea that the demand for a country's currency is derived from the demand for that country's goods as well as the currency itself.

A. 1. false; 2. false; 3. true; 4. true; 5. true; 6. true: in units of the domestic bundle; 7. false: this describes $\frac{1}{1+\text{inflation}}$; 8. false; 9. true; 10. true

Multiple Choice Questions:

Choose the correct answer(s).

- Q1. CPP may not hold because:
- (a) The prices for individual goods are sticky.
 - (b) Transaction costs increase the bounds on deviations from CPP, making it more difficult to arbitrage away price differences.
 - (c) Quotas and voluntary export restraints limit the ability to arbitrage across goods markets.
 - (d) Parallel imports lead to two different prices for the same good.
 - (e) The prices of tradeable goods fluctuate too much, which makes it difficult to quickly arbitrage.

A1. (a), (b), (c).

Q2. Absolute Purchasing Power Parity may not hold when:

- (a) The prices of individual goods in the consumption bundle consistently deviate from CPP across two countries.
- (b) The consumption bundles of different countries are not the same.
- (c) The prices for individual goods are sticky.
- (d) There are tariffs, quotas and voluntary export restraints.
- (e) Competition is perfect.

A2. (a), (b), (c), (d).

Q3. Relative Purchasing Power Parity is relevant because:

- (a) Empirical tests have shown that Absolute PPP is always violated, while Relative PPP is a good predictor of short-term exchange rate exposure.
- (b) Consumption bundles are not always comparable across countries.
- (c) Prices levels are not stationary over time.
- (d) Investors care about the real return on their international portfolio investments.
- (e) Investors care about the nominal return on their international portfolio investments.

A3. (b), (c), (d).

Additional Quiz Questions

Q1. Empirical evidence suggests that PPP holds in the long run. Does this mean that hedging foreign exchange risk is irrelevant in the long run? Give at least two reasons to support your answer.

A1. No, First, there are persistent deviations from PPP in the short run. Thus, you may be bankrupt before the long run arrives. Second, as Keynes said, the long run never quite arrives. Long-run PPP merely means that the variance of the real exchange rate increases less than proportionally with the forecasting horizon $T-t$. That is, even for $T \rightarrow \infty$ there still will be a deviations from PPP.

Q2. If the prices of goods are fairly sticky, does this mean that the nominal and real exchange rates are uncorrelated? Please explain.

A2. No. If P and P^* hardly change, $S P^*/P$ is highly correlated with S .

Exercises

E1. During a shopping spree in Hong Kong, C. Dundee has bought a Sony CD boom box (with woofers and tweeters) for HKD 2,000, jade jewelry for HKD 4,000, and four custom-made suits for HKD 25,000. The spot exchange rate is HKD/AUD 5.

- (a) If CPP held, what should the same boom box, jewelry, and suits cost in Australia?
- (b) Suppose Mr Dundee is (unexpectedly) stopped at customs as he arrives in Melbourne, and must pay import duties of 20 percent. If the same boom box, jewelry, and suits cost AUD 450, AUD 1,500, and AUD 8,000 in Australia, respectively, was his shopping spree worth at least the HKD 10,000 paid for airfare and hotels during his trip?

A1. (a) AUD 400, 800, and 5,000—that is, AUD 6,200 in total.

- (b) The total cost is HKD $(2,000 + 4,000 + 25,000) \times 1.2 + 10,000 = \text{HKD } 47,200$, or AUD $47,200/5 = 9,440$, which is still below the home cost of the bundle, AUD $450 + 1,500 + 8,000 = 9,950$.

- E2. We live in a four-country world where people only grow and eat coconuts. We have the following data:

	Brazil	Mexico	Argentina	United States
Price of one coconut:	BRC 2,000	MEP 5	ARP 1.5	USD 1.4
Exchange rate (in BRC):		BRC/MEP 400	BRC/ARP 1,200	BRC/USD 1,400

- (a) Does Absolute Purchasing Power Parity hold for the BRC with respect to the MEP, ARP, and the USD?
- (b) What is the real exchange rate for the BRC with respect to the MEP, ARP, and the USD?
- (c) If Brazil trades equally with each country, what is the real effective exchange rate for the BRC?
- (d) Is the cost of living in Brazil lower or higher than in Mexico, Argentina, and the US?
- (e) Expected annual inflation is 100 percent in Brazil, 12 percent in Mexico, 25 percent in Argentina, and 6 percent in the United States. According to Relative PPP, what are the expected spot rates (in BRC) one year from now?
- A2. (a) Absolute PPP predicts the following rates:

$$\text{BRC/MEP} \frac{2,000}{5} = 400; \text{BRC/ARP} \frac{2,000}{1.5} = 1,333; \text{and BRC/USD} \frac{2,000}{1.4} = 1,429.$$

Thus, by absolute PPP standards the ARP and USD are undervalued relative to the BRC.

- (b) $\frac{400}{400} = 1; \frac{1,200}{1,333} = 0.900$; and $\frac{1,400}{1,429} = 0.980$.
- (c) $\frac{1 + 0.900 + 0.980}{3} = 0.96$.
- (d) The Brazilian cost of living is the same as that in Mexico, and higher than in the two other countries.
- (e) The predictions from Relative PPP are:
 $\text{BRC/MEP} 400 \times \frac{2}{1.12} = 714.3$; $\text{BRC/ARP} 1200 \times \frac{2}{1.25} = 1,920$; and $\text{BRC/USD} 1,400 \times \frac{2}{1.06} = 2,641.5$.

- E3. Suppose that we live in a three-nut, four-country world. The following table lists prices in each country at times t and $t + 1$, as well as the daily consumptions at time t for each country's representative consumer. Country A's relative trade with Country B is 35 percent, with Country C is 50 percent, and with Country D is 15 percent.

	Country A	Country B	Country C	Country D
	Cost per nut at t			
	Cost per nut at $t + 1$			
	Number of nuts in the average consumption bundle			
Coconut	1,500 XA 2,000 XA 5 nuts	3 XB 4 XB 3 nuts	6 XC 2.5 XC 5 nuts	1 XD 1.75 XD 10 nuts
Brazil nut	750 XA 1,000 XA 20 nuts	1.5 XB 2 XB 12 nuts	3 XC 2 XC 20 nuts	0.75 XD 1.25 XD 50 nuts
Pine nut	250 XA 325 XA 20 nuts	0.5 XB 1.5 XB 18 nuts	1 XC 0.75 XC 20 nuts	0.25 XD 0.50 XD 120 nuts
Spot exchange rate at t		500	250	1,500
Spot exchange rate at $t + 1$		600	300	1,300

- (a) Does CPP hold at time t between Country A and Country B? between Country A and Country C? between Country A and Country D?
- (b) The consumption quantities in Country A and Country C are the same, so we can make meaningful Absolute PPP computations. Can we also make meaningful Absolute PPP computations between Country A and Country B? between Country A and Country D? (Hint: Compare the consumption of Country A and Country B consumers, and identify a common underlying bundle. Then notice that no such common pattern exists between Country D and the three other countries.)
- (c) Consider the first three countries. Take, as the underlying bundle, one coconut, four Brazil nuts, and four pine nuts, and calculate where the purchasing power of XA 11,000 is the highest at time t .
- (d) Consider the first three countries. Take the same underlying bundle as before, and calculate where the purchasing power of XB 44 is the highest at time t .
- (e) Does CPP still hold at time $t + 1$ between Country A and Country B? between Country A and Country C? between Country A and Country D?
- (f) Does Absolute PPP hold at times t and $t + 1$ between the three Latin-American countries. (Assume, for simplicity, that the change in the relative prices across goods and across countries has not affected the composition of the basic consumption bundle.)
- (g) Compute the inflation rates in the usual fashion (that is, ignoring the changes in the consumption pattern that should accompany the change in the relative prices), and verify whether Relative PPP holds between times t and $t + 1$.
- (h) Compare the forecasts from Absolute and Relative PPP for XA/XB and XA/XC. Explain the similarities or differences.
- A3. (a) Yes, yes, yes.
- (b) Country A and Country C have the same consumption bundles. The spending patterns in Countries B and D are different; so, strictly speaking, no meaningful purchasing power comparisons can be made between Country B and D and Countries A and C.
- (c) The prices of one bundle are:
- In Country A: XA $(1 \times 1,500) + (4 \times 750) + (4 \times 250) = \text{XA } 5,500$. So XA 11,000 buys two bundles in Country A.

- In Country *B*: $\text{XB } (1 \times 3) + (4 \times 1.5) + (4 \times 0.5) = \text{XB } 11$. So $\text{XA } 11,000$ buys $\text{XB } 11,000/500 = \text{XB } 22$, which then buys two bundles in Country *B*.
 - In Country *C*: $\text{XC } (1 \times 6) + (4 \times 3) + (4 \times 1) = \text{XC } 22$. So $\text{XA } 11,000$ buys $\text{XC } 11,000/250 = \text{XB } 44$, which then buys two bundles in Country *C*.
- (d) From the preceding question, the purchasing power is the same in the three countries—whether the amount spent is $\text{XA } 11,000$ or $\text{XB } 44$.
- (e) In none of these cases.
- (f) No. The absolute costs of living are:
- Country *A*: $\text{XA } (1 \times 2,000) + (4 \times 1,000) + (4 \times 325) = \text{XA } 7,300$.
 - Country *B*: $\text{XB } (1 \times 4) + (4 \times 2) + (4 \times 1.5) = \text{XB } 18$.
 - Country *C*: $\text{XC } (1 \times 7.5) + (4 \times 2) + (4 \times 2) = \text{XC } 23.5$.
- Thus, the time $t + 1$ Absolute PPP rates are $\text{XA/XB } \sqrt[4]{(7,300/18)} = 405.6$ and $\text{XA/XC } \sqrt[4]{(7,300/23.5)} = 310.6$.
- (g) First compute the inflation rates:

$$\text{Country A: } \frac{(1 \times 2,000) + (4 \times 1,000) + (4 \times 325)}{(1 \times 1500) + (4 \times 750) + (4 \times 250)} - 1 = \frac{7,300}{5,500} - 1 = 32.73 \text{ percent.}$$

$$\text{Country B: } \frac{(1 \times 4) + (4 \times 2) + (4 \times 1.5)}{(1 \times 3) + (4 \times 1.5) + (4 \times 0.5)} - 1 = \frac{18}{11} - 1 = 63.64 \text{ percent.}$$

$$\text{Country C: } \frac{(1 \times 7.5) + (4 \times 2) + (4 \times 2)}{(1 \times 6) + (4 \times 3) + (4 \times 1)} - 1 = \frac{23.5}{22} - 1 = 6.82 \text{ percent.}$$

$$\text{Country D: } \frac{1 \times 1.75 + 5 \times 1.25 + 12 \times 0.5}{1 \times 1 + 5 \times 0.75 + 12 \times 0.25} - 1 = \frac{14}{7.75} - 1 = 80.65 \text{ percent}$$

(notice the different weights in the bundle).

For Relative PPP to hold, the rates should have been:

$$\text{Country B: } 500 \times \frac{1.3273}{1.6364} = 405.6.$$

Instead, XB appreciated far too much (by Relative PPP standards), to 600.

$$\text{Country C: } 250 \times \frac{1.3273}{1.0682} = 310.6.$$

Instead, XB appreciated to 300, which is about correct (by Relative PPP standards).

$$\text{Country D: } 1500 \times \frac{1.3273}{1.8065} = 1102.1.$$

The actual XB depreciation, to 1300, was insufficient (by Relative PPP standards).

- (h) The Relative PPP predictions for XA/XB and XA/XC at time $t + 1$ are the same as the Absolute PPP predictions, because Absolute PPP holds at time t for these countries. That is, when starting from an Absolute PPP exchange rate, the Relative PPP forecast is another Absolute PPP rate. If there had been deviations from Absolute PPP at time t , the forecasts from absolute PPP and Relative PPP would have been different.

- E4. Suppose that, during the seventies, the consumer price indices in Antarctica and Greenland went up by 80 percent and 70 percent, respectively, while the indices of production costs went up by 65 percent and 60 percent, respectively. Greenland's exchange rate appreciated by 10 percent. Antarctica's trade unions claim that this means that the export sector is hugely profitable, implying that wages should rise. Do you agree?
- A4. Antarctica's exports have become more attractive relative to domestic sales, in terms of sales prices, because the actual appreciation of the Greenland crown (10 percent) exceeds $1.8/1.7 - 1 = 5.9$ percent, the rate at which the price inflation differential is offset by exchange rate changes. Antarctic exporters are also better off in terms of costs relative to their foreign competitors because the actual appreciation of the Greenland crown exceeds $1.65/1.6 - 1 = 3.1$ percent, the rate at which the cost inflation differential would have been offset by the exchange rate change, but whether or not profits are huge, or positive at all, is impossible to say, since we have relative data only.
- E5. In Antarctica and Greenland, the production technologies for an agricultural commodity differ because of soil quality production and different capital/labor costs. The following are data on unit costs:

	Antarctica			Greenland		
	input	price at t	price at T	Input	Price at t	Price at T
Land (rent)	10m ²	100	120	8 m ²	1,100	1,500
Machines		300	400	2 units	4,000	5,100
(rent)	3 units					
Labour		100	110	10 units	600	700
(wages)	8 units					

- (a) Which country is the cheaper location at time t , and at time T , if the exchange rate is a constant seven units of Greenland crown per unit of Antarctica dollar?
- (b) Is the relative advantage constant?
- (c) Make a comparison between the above production-cost calculations and the concepts of Absolute PPP versus Relative PPP.
- (d) We said that Absolute PPP calculations do not make any sense if commodity preferences differ. What difference is there between comparing production costs in different countries (even if they have different production technologies) and comparing consumption price levels of different countries when preferences differ?
- A5. (a) Costs in Antarctica rose from 2,700 to 3,280, while costs in Greenland rose from 22,800 (that is, AAD 3,257) to GRC 29,200 (that is, AAD 4,171). Thus, Antarctica was cheaper both at time t and time T .
- (b) No. Costs went up by 21.5 percent in Antarctica and 28 percent in Greenland.
- (c) The comparison in (a) is like a test of Absolute PPP. The analysis in (b) is like a test of Relative PPP.
- (d) Consumption results in utility, which cannot be compared across individuals unless individuals are identical. Production yields a product whose cost and market value can be expressed in money terms—an objective measure. So you can validly compare costs across countries, even though the technologies are different.

Mind-Expanding Exercises

- ME1. Suppose that French wheat can be imported without cost into Canada. However, a customs duty is levied when Canadian wheat is imported into France.
- In what direction could deviations from CPP occur? (Hint: we can rule out any deviation that would lead to arbitrage gains by wheat traders.)
 - Show that the relative version of CPP holds between times t and $t + 1$ if Canada is systematically the exporter or if France is systematically the importer. Explain why, in other cases, Relative CPP is likely to fail.
- A1. Pick the CAD as the home country. Consider the three possible situations (gains; break-even; losses) for each direction of trade:
- | | |
|-----------------------------------|---|
| (i) $P_t > P_t^* S_t$ | imports to Canada lead to arbitrage profits; |
| (ii) $P_t = P_t^* S_t$ | imports to Canada lead to neither profits nor losses; |
| (iii) $P_t < P_t^* S_t$ | imports to Canada lead to losses, so there will be no trade. |
| (iv) $P_t (1 + \tau) < P_t^* S_t$ | imports to France lead to arbitrage profits; |
| (v) $P_t (1 + \tau) = P_t^* S_t$ | imports to France lead to neither profits nor losses; |
| (vi) $P_t (1 + \tau) < P_t^* S_t$ | imports to France lead to losses, so there will be no such trade. |

Since wheat is a commodity that is traded in a competitive market, there are no entry barriers or cartels that prevent trade; but the same mechanism also rules out arbitrage profits from trading. So cases (i) and (iv) are ruled out.

- At any time t , there can be one-sided deviations from Absolute CPP. Specifically, because of the tariff, translated French prices can be higher than Canadian prices:

$$P_t \leq S_t P_t^* \leq P_t (1 + \tau)$$

with equality if there is trade (cases (ii) or (v)).

- Generally, Relative CPP will not hold, unless trade is systematically in the same direction (case (ii) or (v)). First, if at times t and $t + 1$, there are imports from France (case (ii)), then $P_t = P_t^* S_t$ and $P_{t+1} = P_{t+1}^* S_{t+1}$: that is, CPP holds in the Absolute and in the relative sense. Second, if at times t and $t + 1$, there are imports to France (case (v)), then prices are not equal, but CPP still holds in the relative sense: the constant $(1 + \tau)$ in $P_t (1 + \tau) = P_t^* S_t$ and $P_{t+1} (1 + \tau) = P_{t+1}^* S_{t+1}$ cancels out as soon as we consider percentage changes.

Chapter 12 The Balance of Payments

Quiz Questions

True-False Questions

- _____ 1. If a country has a BOP deficit, the total of all BOP subaccounts is negative.
- _____ 2. The current account is a record of all trade in goods and services, while the capital account is a record of direct and portfolio investment and unilateral transfers.
- _____ 3. When the US private sector purchases more goods or makes more investments abroad than foreigners purchase or invest in the US during a year, the Federal Reserve (the US central bank) must make up for the shortfall.
- _____ 4. All errors and omissions in the BOP are a result of black market transactions.
- _____ 5. When a corporation purchases a company abroad, and the value of the firm appreciates over time, the NII and the capital account of the BOP is updated to reflect this change.
- _____ 6. According to the Keynesian approach to exchange rate determination, sticky prices are compensated for by the continuous flow of capital.
- _____ 7. The BOP theory of exchange rate determination says that most changes in the exchange rate are due to the arrival of new information.
- _____ 8. Under a fixed exchange rate regime, if a country's private sector sells abroad more than it purchases, the central bank must sell foreign exchange.
- _____ 9. BOP theory is flawed is because it assumes that investors only invest in risk-free domestic and foreign assets.

Ans. 1. false; 2. false; 3. true (if "investments" include short-term credit); 4. false; 5. false; 6. true; 7. false (except for information on r and r^*); 8. false (the central bank must buy if the $KA \geq 0$ and $CA > 0$); 9. true

Multiple Choice Questions

For the following questions, assume that Antarctica is the home country, and its currency is the Antarctica dollar (AAD), and Greenland is the foreign country and its currency is the crown (GRC). Choose the correct answer:

- Q1. All else being equal, an increase in income in Greenland leads to:
- (a) An increase in consumption in Antarctica, and therefore an increase in imports, resulting in an appreciation of the AAD.
 - (b) A decrease in consumption in Antarctica, and therefore an increase in exports, resulting in a depreciation of the AAD.
 - (c) An increase in consumption in Greenland, and therefore an increase in imports, resulting in an appreciation of the AAD.
 - (d) An increase in consumption in Greenland, and therefore an increase in imports, resulting in a depreciation of the AAD.

A1. (c).

- Q2. All else being equal, a decrease in the interest rate r^* in Greenland leads to:
- (a) Decreased demand for assets in Greenland, and therefore a depreciation of the GRC.
 - (b) Decreased demand for assets in Greenland, and therefore a depreciation of the AAD.

- (c) An increase in consumption in Greenland, and therefore an increase in imports, resulting in an appreciation of the GRC.
- (d) An increase in consumption in Antarctica, and therefore an increase in exports, resulting in a depreciation of the AAD.

A2. (a).

- Q3. All else being equal, a decrease in prices in Greenland leads to:
- (a) An increase in exports to Antarctica, and therefore an appreciation of the AAD.
 - (b) An increase in exports to Antarctica, and therefore a depreciation of the AAD.
 - (c) An increase in consumption in Greenland, and therefore an increase in imports, resulting in an appreciation of the AAD.
 - (d) An decrease in consumption in Greenland, and therefore an decrease in imports, resulting in a depreciation of the AAD.

A3. (b).

Additional Quiz Questions

- Q1. The German subsidiary of a Canadian firm (that is, the subsidiary is owned by the Canadian firm) is sold to a German firm. The Canadian firm invests the funds obtained from the sale in Frankfurt. How is the transaction recorded in the Canadian BOP?
- A1. Source: outward direct investment (decrease of foreign direct investment); use: outward portfolio investment.
- Q2. The BOP of Timbuktu showed the following entries for 1988: a capital account surplus of 50, a deficit in the services account (S) of 15, and a trade deficit (T) of 45. The change in the official reserves was zero. What was the balance of unilateral transfers for Timbuktu?
- A2. $\Delta RFX = 0 = \text{USD } 50 + CA$
 $CA = -\text{USD } 50 = -\text{USD } 45 - \text{USD } 15 + \text{Transfers}$
 $T = \text{USD } 10.$
- Q3. If the central bank sets an exchange rate that undervalues the foreign currency, then—other things being the same—what will be the impact on the following:
- a) RFX (increase/decrease)?
 - b) BOP (surplus/deficit)?
- A3. (a) The undervalued foreign currency encourages imports and discourages exports to the home country, thus the CA is less than zero. Investment (including foreign direct investment in the export sector) is not attractive, therefore, the KA is likely to be less than 0. The BOP always balances, but CA and KA are likely to be negative, as we saw.
- (b) Whatever definition of the BOP you use, there is likely to be a deficit (net outflow).
- Q4. If the current account balance has a surplus of USD 2 billion and the official settlements balance (RFX) has a deficit of USD 5 billion, what is the balance of the capital account?
- A4. Current account + capital account = ΔRFX . Thus, the capital account balance equals -7 billion.

- Q5. A British importer purchases goods from a French company and obtains a trade credit for the full value of the shipment (equal to GBP 100). How should this transaction be recorded in the UK BOP?
- A5. Use: Imports -100; Source: Trade Credit + 100 (short-term inward investment).
- Q6. Timbuktu, a country on the Atlantis continent, has a government deficit of 40 billion while private investment exceeds private savings by 10 billion. What is Timbuktu's current account balance if its exchange rate is fixed?
- A6. $Taxes - G_{exp} = Sav^G = -\text{USD } 40 \text{ billion.}$
 $Sav^P - I = Sav^P = -\text{USD } 10 \text{ billion.}$
 $CA = Sav^P + Sav^G = -\text{USD } 10 \text{ billion} - \text{USD } 40 \text{ billion} = -\text{USD } 50 \text{ billion.}$

Exercises

- E1. Antarctica uses a system of fixed exchange rates, its current account deficit is 6 billion, and its capital account balance is USD 4 billion.
 Based on this information, answer the following questions:
- What is the change in the official foreign exchange reserves of Antarctica?
 - What is the gap between its income of Antarctica and its expenditure on domestic output?
 - If there is only one other country in the world, Greenland, can you estimate the current account balance of Greenland?
- A1. $CA = -\text{USD } 6 \text{ billion}$
 $KA = \text{USD } 4 \text{ billion}$
- $\Delta RFX = CA + KA = -\text{USD } 6 \text{ billion} + \text{USD } 4 \text{ billion} = -\text{USD } 2 \text{ billion}$
 - The gap between the Antarctica's income and its expenditures on domestic output (A) is its net exports, that is, its current account. Thus, -USD 6 billion.
 - USD 6 billion.
- E2. The data below are taken from the BOP of Switzerland. Based on this data, decide whether the following statement is true or false and explain your answer:
"From 1979 to 1982, foreigners have been net issuers of SF-denominated bonds in the Swiss capital markets."

Capital account	1979	1980	1981	1982
Portfolio investment (in billions of dollars)	-11.8	-11.8	-11.9	-32.2

- A2. We can conclude that, on balance, capital flowed out of Switzerland, but:
- This need not be because of Swiss purchases of *securities*. Possibly, Swiss banks granted loans to foreigners, or Swiss residents paid back bank loans that they had made abroad in the past.
 - If the transactions do reflect Swiss purchases of securities, the securities need not be *bonds*. For example, Swiss residents may have bought stocks originally held by foreigners—including stocks that were issued, in the past, by Swiss companies.
 - If the transactions relate to bonds, these need not be bonds newly issued by foreigners. The bonds bought by Swiss residents could also be old bonds—including bonds originally issued abroad by Swiss companies.
- E3. A company in Philadelphia purchases machinery from a Canadian company for USD 150 and receives a one year trade credit. The machinery is transported to Philadelphia

by a Canadian trucking company that charges the US company USD 10. The US company insures the shipment with a US insurance company and pays a premium of USD 3. After delivering the machinery to Philadelphia, the Canadian truck continues its trip to Houston, where it picks up microcomputers sold by a Texan company to a Mexican company. This shipment, which is worth USD 170, is insured by a US insurance company for a premium of USD 4. No trade credit is given to the Mexican company. Compute the US BOP and assume that Canadian and Mexican companies maintain dollar deposits in New York.

A3.

By transaction:**Sources**

Trade credit (short-term inflow)	150
Increase USD owned by Canadian *	10

Uses

Imports (goods from Canada)	150
Imports (services from Canada)	10

Exports (goods to Mexico)	170
exports (services to Canadian trucker)	4

decrease USD owned by Mexicans*	174
	324

*: transactions on the short-term capital account. The Canadian trucker invests her revenue in a USD deposit (a "source", from the US point of view), while the Mexican firm reduces its USD deposits (that is, the US reduces its debt to Mexicans—a "use", from the US point of view).

By BOP account:	Sources	Uses	Net inflow
Balance of trade	170	150	20
Invisibles balance	4	10	-6
Current account	174	160	14
Short-term capital transactions	160	174	-14
Capital account	160	174	-14
Balance of payments	324	324	0

E4. Suppose that you are an analyst for the Central Bank of Zanzibar. Decide how the BOP accounts are affected by the following:

- A budget deficit financed by foreign borrowing.
- An import quota for foreign cars.
- A purchase of a new embassy in Luxembourg.
- A grain embargo.

A4. (a) Sale of securities to foreigners: inward PI (source). The interest paid will be an outflow (use) on the service balance, and the amortization an outflow (use) on PI.

- Trade balance: decrease in imports.
- Transfers: outward unilateral transfer.
- Trade balance: decrease in imports.

E5. The following data are taken from the balance of payments of Germany:

Capital account	1979	1980	1981	1982
Portfolio investment (in billions of dollars)	+2.9	-6.9	-5.4	-8.7

Is the following statement consistent with the data shown above? *"After 1979, foreigners have issued DEM denominated bonds in the German capital market in order to take advantage of the favorable interest rate differential with respect to the U.S. capital market."*

- A5. Yes. If the German residents increase the amount of foreign assets they own, the transaction is recorded as a use (outflow) in the German BOP: there is an outflow of DEM.
- E6. The following passage is from an article that appeared in a newspaper: *"Last year, the US demand for capital to fund the federal deficit and to finance private investment in buildings and equipment exceeded net domestic savings by about USD 100 billion."* What can we infer about the magnitude of the U.S. current account deficit?
- A6. It is at least USD -100 billion.
- E7. The following passage is from an article that appeared in the *Wall Street Journal*: Which account of the German BOP is the article talking about?
"FRANKFURT, West Germany—West Germany's balance of payments, which measures all flows of funds into and out of the country, was in surplus by the current equivalent of USD 210.3 million in February, up from the year-earlier surplus of USD 206.4 million but sharply lower than January's surplus of USD 10.04 billion. The central bank said January's large surplus was caused in part by heavy central-bank intervention in support of the French franc prior to the realignment of the European Monetary System at mid-month."
- A7. The article refers to the change in official reserves because this is the only account that will be affected by "heavy central-bank intervention."
- E8. The BOP of the U.S. in 1982 and 1984 is shown below. Is it correct to state, as it has often been done, that the deterioration of the current account was primarily financed by sales of U.S. Treasury securities to foreigners?

U.S. BALANCE OF PAYMENTS
(billions of dollars)

	1982	1984
Trade Account	-36	-108
Service Account	35	17
Unilateral Transfers	-8	-11
CURRENT ACCOUNT	-9	-102
Changes in US assets abroad (private) of which:	-108	-16
Portfolio	-8	-5
Bank-reported	-111	-7
Direct investment	6	-6
Other	5	2
Changes in foreign assets in US (private) of which:	92	91
U.S. Treasury Security	7	22
Other	85	69
PRIVATE CAPITAL	-16	75
OFFICIAL SETTLEMENTS	-8	-3
STATISTICAL DISCREPANCY	33	30

- A8. The statement is wrong. The current account deficit deteriorated by USD 93 billion, while foreign purchases of Treasury securities increased by only USD 15 billion. Most of the financing came from US banks that lent money inside the US instead of lending abroad as they had done in 1982 (bank capital outflows of USD 111 billion).
- E9. Venizio had a government surplus of 15 billion in the year 1988. In addition, private after-tax savings exceeded private investment spending by 10 billion. What was the current account balance of Venizio in 1988?
- A9. $CA = Sav^P + Sav^G = \text{USD } 10 \text{ billion} + \text{USD } 15 \text{ billion} = \text{USD } 25 \text{ billion}.$

Mind-Expanding Exercise

- ME1. You have been hired by the IMF to design a program to improve the current account balance. How should your program influence the following variables (increase/decrease):
- Taxes?
 - Government spending
 - Private savings?
- A1.
 - Increase taxes to reduce the budget deficit (or private consumption).
 - Decrease government spending to reduce the budget deficit.
 - Increase private savings to reduce private consumption.