Economics 333
HW #4
Due 11/7/2024

Ten point bonus if the homework is submitted in hard copy in class.

1a. What are the two guiding principles of the WTO?
b. Suppose the U.S. enters into a free trade agreement with Japan. After the agreement, U.S. trade with Japan increases, but U.S. trade will all other countries decreases by an identical amount. Was the free trade agreement economically beneficial or harmful to the U.S.? Why?

2. The following questions concern the supply and demand for Brazilian reals. The exchange rate is denoted as $E_{\$/Real}$. For each question state whether the supply of reals, demand for reals or both curves will shift, and in which direction.
a. Brazilian incomes fall as Brazil enters a recession
b. The U.S. Federal Reserve raises interest rates
c. Brazil places tariffs on U.S. exports to Brazil
d. The demand for coffee, a major Brazilian export, falls in the U.S.
e. Investors fear political unrest in Brazil due to a hotly contested upcoming election
f. U.S. inflation rises
g. A new coronavirus strain arising in Brazil causes the U.S. to close its borders to Brazilian tourists

3. The value of a Polish Zloty ($E_{\$/Zloty}$) is equal to .25 and the value of a New Zealand Dollar ($E_{\$/NZ\$}$) is .60. The exchange rate between the Polish Zloty and the Mexican peso ($E_{Zloty/Peso}$) is .2. Assuming that triangular arbitrage holds, calculate
a. $E_{Zloty/NZ\$}$
b. $E_{\$/Peso}$

4a. A Cadbury chocolate bar made in the U.K. costs one pound while a Hershey's chocolate bar made in the U.S. costs one dollar. Calculate the cost of the Cadbury bar in dollars when the exchange rate, $E_{\$£} = 1.1$? When $E_{\$£} = 1.25$? Write your answers in the table below.
b. Calculate the cost of the Hershey's chocolate bar in British pounds when the exchange rate, $E_{\$£} = 1.1$? When $E_{\$£} = 1.25$?

Exchange Rate	Cost of Cadbury bar		Cost of Hershey bar	
$E_{\$/£}$	Dollars	Pounds	Dollars	Pounds
1.1		1	1	
1.25		1	1	

c. What effect will an increase in the exchange rate ($E_{\$/£}$) have on U.S. purchases of Cadbury bars? Will this i) shift the demand curve for British pounds ii) supply curve for British pounds iii) move up the demand curve or iv) move up the supply curve ?

5. Exchange rates are often summarized in a matrix that lists all the exchange rate combinations between a set of countries. The columns list the exchange rate in terms of home country currency per foreign currency, where the column heading is the home country. The rows list the exchange rate in terms of foreign currency units per home currency, where the row heading is the home country. For example, $E_{A/B}$ is the amount of currency A needed to buy one unit of currency of B. An exchange rate matrix where there are three countries, A, B and C, would look as follows:

	Country A	Country B	Country C
A	$E_{A/A}$	$E_{B/A}$	$E_{C/A}$
B	$E_{A/B}$	$E_{B/B}$	$E_{C/B}$
C	$E_{A/C}$	$E_{B/C}$	$E_{C/C}$

Suppose you have the following information about the exchange rates for country C:

	Country A	Country B	Country C
A	1	$E_{B/A}$	$E_{C/A}$
B	.4	$E_{B/B}$	$E_{C/B}$
C	.6	$E_{B/C}$	1

Complete the rest of the table assuming that triangular arbitrage holds.

6a. Assume that a basket of goods and services costs the following amounts in three countries:
U.S. $30,000
Australia 36,000 AUD
Canada 45,000 CAD

The costs are given in terms of the currencies of each country. AUD stands for Australian dollars and CDN stands for Canadian dollars.

Use the above information to calculate the following exchange rates, assuming that absolute PPP holds.
$E_{\$/AUD}$

$E_{\$/CAD}$

$E_{CAD/AUD}$

b. Provide one explanation for why PPP may not hold in the short run.

7. For each of the following explain how foreign exchange traders can make arbitrage profits. State which currency or currencies they would be buying or which currency or currencies they would be selling, and if applicable where.
a. The dollar-Euro exchange rate ($E_{\$/Euro}$) is equal to 1.10 in New York and 1.06 in London.
b. The dollar-Euro exchange ($E_{\$/Euro}$) is equal to 1.1, the dollar-pound exchange rate ($E_{\$/£}$) is equal to 1.2 and the pound-euro exchange rate ($E_{£/Euro}$)is equal to .95.

ANSWERS

1a. Multilateralism and nondiscrimination

b. A free trade agreement is beneficial if it increases overall trade (trade creation) but is harmful if it diverts trade from one country to another. In this example there was no new trade so the agreement was harmful.

2. When the U.S. buys something from Brazil, it generates a demand for reals.

When Brazil buys something from the U.S., it generates a supply of reals

a. Brazilians would buy fewer U.S. goods and services. The supply of reals would shift leftwards.

b. More Brazilians would invest in the U.S., shifting the supply of reals rightwards. Fewer Americans would invest in Brazil, shifting the demand for reals leftwards.

c. American exports to Brazil will fall. American exporters will therefore be exchanging fewer reals into dollars. The supply of reals will shift leftwards.

d. U.S. importers need reals to buy Brazilian coffee. If the demand for coffee falls, they will need fewer reals, shifting the demand curve for reals leftwards.

e. Both Brazilian and U.S. investors will flee Brazil. U.S. investors will invest less in Brazil, decreasing the demand for reals. Brazilian investors will invest more in the U.S., shifting the supply of reals rightwards.

f. U.S. goods are now relatively more expensive than Brazilian goods. More Americans would buy Brazilian goods, shifting the demand for reals rightwards. Fewer Brazilians would buy American goods, shifting the supply of Reals leftwards.

g. The supply of reals will decrease as fewer Brazilian tourists exchange reals for dollars.

3. $E_{Zloty/NZ\$} = E_{\$/NZ\$} / E_{\$/Zloty} = .6/.25 = 2.4$

$E_{\$/Peso} = E_{Zloty/Peso} * E_{\$/Zloty} = .2 * .25 = .05$

4.

Exchange Rate	Cost of Cadbury bar		Cost of Hershey bar	
$E_{\$£}$	Dollars	Pounds	Dollars	Pounds
1.1	1.10	1	1	.91
1.25	1.25	1	1	.8

An increase in the exchange rate makes Cadbury bar more expensive to U.S. consumers, decreasing U.S. consumption. This is represented as a movement up the demand curve for British pounds.

5. $E_{B/B} = 1$
$E_{C/A} = 1/E_{A/C} = 1/.6 = 1.66$
$E_{B/A} = 1/E_{A/B} = 1/.4 = 2.5$
$E_{B/C} = E_{A/C} / E_{A/B} = .6/.4 = 1.5$
$E_{C/B} = 1/E_{B/C} = 1/1.5 = .66$

	Country		
	A	B	C
A	1	2.5	1.66
B	.4	1	.66
C	.6	1.5	1

6a.
$E_{\$/AUD}$ 30,000/36,000 = .833
$E_{\$/CAD}$ 30,000/45,000 = .667
$E_{CAD/AUD}$ 45,000/36,000 = 1.25

b. Possible reasons are
1. Nontraded goods
2. Transportation costs, tariffs and other trade barriers
3. Imperfect competition and legal obstacles
4. Price stickiness
5. Excise taxes

7a. Euros are cheaper in London than in New York, so investors would buy Euros in London and sell them in New York.
b. The direct cost of a Euro is $1.10. The indirect cost of a Euro using the British pound is $E_{\$/£}*E_{£/Euro} = 1.2*.95 = 1.14$. An investor should buy Euros directly and sell them indirectly. This involves exchanging dollars for Euros, and then Euros for pounds, and finally pounds for dollars. An investor with one dollar could buy (1/1.1) = .909 Euros. This can be converted into .909*.95 = .863 pounds. This in turn can be converted into 1.2*.863 = 1.036 dollars.