Public Affairs 854   Menzie D. Chinn
Spring 2021   Social Sciences 7418
University of Wisconsin-Madison
Problem Set 1 <mark>(rev'd 2/22)</mark>
Due on Canvas, Tuesday, February 23, 5pm.

1. Balance of payments identities. Recalling the balance of payments identity, $CA + FA + ORT \equiv 0$, answer the following questions.

1.1 If CA > 0 and the central bank is neither accumulating nor decumulating foreign exchange reserves, what must be true about private capital inflows?

1.2 If a country maintains a pegged exchange rate and runs a balance of payments surplus, then what must be true about ORT? Explain what this means in words.

1.3 From the Chinese perspective, if the Chinese central bank (People's Bank of China) is purchasing U.S. securities (T-bills, corporate bonds and stocks) and the U.S. central bank (Federal Reserve) is purchasing no Chinese securities, then what is the value of FA (Ignore direct investment for purposes of this question)? What is the value of ORT?

Download the most recent issue of *Economic Indicators*, compiled by the Council of Economic Advisers and published by the Joint Economic Committee. There is a link to this document here: http://www.gpo.gov/economicindicators

1.4 What is the Current Account for 2019? (No calculation necessary.)

2. The foreign exchange market. Using a supply and demand diagram, and defining the US as the home country and either euro area as the foreign, show what happens in the following situations (assuming a flexible exchange rate regime).

2.1   US demand for French cheese increases.

2.2   French demand for American stocks declines.

Using the Table reproduced from the *Economist* (February 13th edition, https://www.economist.com/economic-indicators/2021/02/13/economic-data-commodities-and-markets), answer the following questions. **Show your work, and "box in" your answers.**

2.3   From an American perspective, has the US dollar (USD) appreciated or depreciated against the yen over the past year? (The *Economist* data is expressed as foreign currency units per US dollar).

2.4   How many US dollars does it take to buy a single Australian dollar (AUD) now? How many did it take a year ago? Has the US dollar appreciated or depreciated?

2.5   What is the exchange rate of Japanese yen (JPY) for Australian dollars (AUD) (i.e., how many Japanese yen does it take to purchase a single Australian dollar)?

2.6   Suppose you expect the exchange rate on February 10, **2022** is going to be 0.67 British pounds to buy one US dollar. What is the expected change (in percent terms), or depreciation, of the US dollar that you expect over the next year?

1

Economic data
2 of 2

	Current-account balance % of GDP, 2020†		Budget balance % of GDP, 2020†		Interest rates 10-yr gov't bonds latest,%	change on year ago, bp	Currency units per $ Feb 10th	% change on year ago
United States	-2.2		-14.9		1.1	-41.0	-	
China	1.5		-5.2		3.1 §§	51.0	6.44	8.4
Japan	2.7		-12.2		nil	-8.0	105	4.8
Britain	-1.3		-19.7		0.5	-11.0	0.72	6.9
Canada	-2.1		-13.5		1.0	-32.0	1.27	4.7
Euro area	2.6		-9.2		-0.5	-4.0	0.82	12.2
Austria	2.4		-8.5		-0.3	-1.0	0.82	12.2
Belgium	-1.1		-9.4		-0.2	-8.0	0.82	12.2
France	-2.3		-10.9		-0.2	-9.0	0.82	12.2
Germany	6.8		-7.0		-0.5	-4.0	0.82	12.2
Greece	-6.6		-9.2		0.8	-25.0	0.82	12.2
Italy	2.9		-11.3		0.5	-46.0	0.82	12.2
Netherlands	7.2		-6.9		-0.5	-18.0	0.82	12.2
Spain	0.8		-12.0		0.2	-14.0	0.82	12.2
Czech Republic	1.3		-6.7		1.5	-5.0	21.3	7.8
Denmark	8.5		-3.6		-0.3	4.0	6.13	11.6
Norway	3.2		-1.3		1.2	-19.0	8.44	9.9
Poland	3.6		-7.9		1.3	-79.0	3.70	5.7
Russia	2.0		-3.8		6.6	38.0	73.9	-13.2
Sweden	4.8		-3.5		0.2	14.0	8.32	16.2
Switzerland	9.1		-3.7		-0.3	32.0	0.89	10.1
Turkey	-5.4		-3.4		12.5	170	7.05	-14.8
Australia	1.2		-7.3		1.2	17.0	1.29	16.3
Hong Kong	6.2		-7.6		1.1	-40.0	7.75	0.3
India	1.3		-7.2		6.0	-43.0	72.8	-2.1
Indonesia	-1.6		-7.2		6.2	-39.0	13,983	-2.1
Malaysia	4.8		-7.4		2.8	-22.0	4.04	2.7
Pakistan	0.1		-8.1		10.0 †††	-133	159	-2.9
Philippines	3.4		-7.8		3.1	-130	48.0	5.7
Singapore	18.2		-13.9		1.1	-66.0	1.33	4.5
South Korea	3.8		-5.7		1.8	22.0	1,107	7.2
Taiwan	13.8		-1.5		0.3	-25.0	28.0	7.4
Thailand	3.7		-6.4		1.3	23.0	29.9	4.6
Argentina	0.6		-8.6		na	-464	88.3	-31.0
Brazil	-0.7		-15.8		7.8	122	5.38	-19.9
Chile	1.4		-7.9		2.6	-80.0	726	9.6
Colombia	-3.6		-8.8		4.9	-72.0	3,558	-3.2
Mexico	2.3		-4.5		5.3	-133	20.0	-6.3
Peru	1.0		-8.0		3.8	-10.0	3.64	-6.6
Egypt	-3.6		-8.5		na	nil	15.7	0.5
Israel	3.9		-11.8		0.9	4.0	3.26	4.9
Saudi Arabia	-3.7		-10.6		na	nil	3.75	nil
South Africa	0.6		-16.0		8.6	-34.0	14.7	2.2

Source: Haver Analytics. §§5-year yield. †††Dollar-denominated bonds.

The Economist

2

3. Equilibrium income and multipliers. Consider the following model of the economy:

Eq.No. Equation | Description

(1) $Y = AD$ Output equals aggregate demand, an equilibrium condition
(2) $AD \equiv C + I + G + X - IM$ Definition of aggregate demand
(3) $C = \bar{C} + c(Y - T + Tr)$ Consumption function, c is the MPC
(4) $Tr = \overline{Tr}$ Govt transfers function (Unemployment insurance, SNAP)
(5) $T = tY$ Tax function
(6) $I = \bar{I}$ Investment function
(7) $G = \bar{G}$ Government spending on goods and services
(9) $X = \bar{X}$ Export spending
(10) $IM = \bar{IM} + mY$ Import spending

3.1   Solve for Y, setting $\bar{A} \equiv \bar{C} + \bar{I} + \bar{G}$

3.2   Calculate the change in income for a given change in (autonomous) investment. Show your work!

3.3   Calculate the change in income for a given change in transfers expenditures. Show your work!

3.4   Calculate the change in the budget balance for 3.2, and for 3.3. Recall the budget balance in this economy is T-G-Tr . (Government transfers differ from government spending on goods and services because government transfers – like Social Security payments, unemployment insurance payments, and food stamps/SNAP – do not involve purchases of goods and services; rather they augment personal income).

3.5   Calculate the change in the trade balance for 3.2, and for 3.3. Hint: $TB \equiv X - IM$, so $\Delta TB = \Delta X - (\Delta IM + m\Delta Y)$. Show your work!

4.6   In words, explain why in one case the budget balance and trade balance move in the same way, and in another case, they move in opposite directions.