Intro. Macroeconomics

ECON1002

Tutorial[1] 12

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Plan of Today

- Concept review
- Tutorial question
- Simple extension for all

Concept Review

1. Nominal vs. Real Exchange Rate
2. Purchasing Power Parity Theory
3. Impossible Trinity

Nominal Exchange Rate

Relative value between two currencies

Example: Australian Dollar vs. Japanese Yen

$$e_{JPY,AUD} = \frac{JPY}{AUD}$$

This reads "the amount of JPY you can buy with 1 AUD"

If $e_{JPY,AUD} = 100$,

we say "you can get 100 JPY with 1 AUD."

Real Exchange Rate

The price of average domestic goods in terms of the average foreign goods

$$q \equiv e \times \frac{P}{P^f}$$

This equation reads "real exchange is equivalent to nominal exchange rate times the relative price level between two countries"

Rearrange this equation gives

$$q \equiv e \times \frac{P}{P^f} = \frac{JPY}{AUD} \cdot \frac{P_{aus}}{P_{jp}} = \frac{JPY}{P_{jp}} / \frac{AUD}{P_{aus}}$$

$\frac{JPY}{P_{jp}}$ is the real value of JPY and $\frac{AUD}{P_{aus}}$ is the real value of AUD

This is just the real relative value between two currencies

Nominal Rate

The relative value between two currencies

$$e_{JPY,AUD} = \frac{JPY}{AUD}$$

Real Rate

The **real** relative value between two currencies

$$q \equiv e \times \frac{P}{P^f} = \frac{JPY}{AUD} \cdot \frac{P_{aus}}{P_{jp}} = \frac{JPY}{P_{jp}} / \frac{AUD}{P_{aus}}$$

Law of One Price

The real value of the same good should be the same across countries [1]

Why? *If people found iPhone is more expensive in Australia compares to the State, they will buy it in U.S. and resell it in Australia.*

Purchasing Power Parity (PPP) Theory

Nominal exchange rate are determined such that **Law of One Price** holds

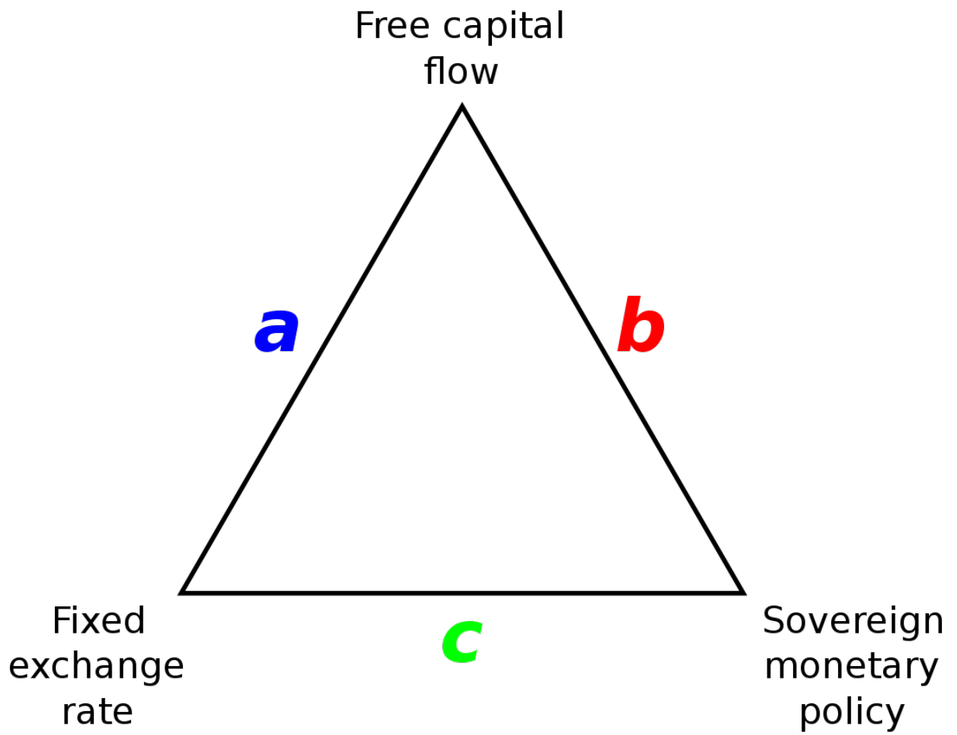
Shortcomings: PPP doesn't always hold in the short-run. **Why?**

- Many goods are not traded globally
- Goods are not identical

1. Assuming transportation cost is low, and arbitrage is possible

Impossible Trinity

- **Option A**
  - Give up monetary independence for fixed exchanged rate and free capital flow, Hong Kong (China)
- **Option B**
  - Give up fixed exchange rate for free capital flow and independent monetary policy, U.S.
- **Option C**
  - Give up free capital flow for fixed exchange rate and independent monetary policy, China (*Arguably*)



Tutorial Questions

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1. How would each of the following be likely to **affect the value of AUD**, all else being equal? Explain

How would this affect the value of AUD?

Australian shares are perceived as having become much riskier financial investments.

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AUD depreciates as higher risk decreases investors demand on AUD.

How would this affect the value of AUD?

European computer firms switch from Australian-produced software to software produced in India, Israel and other nations.

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Demand for Australia goods (software) decreases, so demand for AUD decreases, so the value of AUD depreciates.

How would this affect the value of AUD?

As East Asian economies recover, international financial investors become aware of many new, high-return investment opportunities in the region.

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As East Asian economies recover, international financial investors become aware of many new, high-return investment opportunities in the region.

Investors switch their attention to the East Asian market, which decreases the demand for AUD, AUD depreciates.

How would this affect the value of AUD?

The Australian government imposes a large tariff on imported automobiles.

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Australians buy less foreign automobiles, i.e. decreasing the supply of AUD to the global market, AUD appreciates.

How would this affect the value of AUD?

The Reserve bank reports that it is less concerned about inflation and more concerned about an impending recession in Australia. [1]

1. The tricky one

How would this affect the value of AUD?

The Reserve bank reports that it is less concerned about inflation and more concerned about an impending recession in Australia.

If recession indeed hits, RBA lowers policy rate, making Australian financial assets less attractive, decreasing the demand for AUD, AUD depreciates. This could be offset by another effect of recession, which is lowered demand for foreign goods, which lowers the supply of AUD, leading to AUD appreciating.

How would this affect the value of AUD?

Australian consumers increase their spending on imported goods.

How would this affect the value of AUD?

Australian consumers increase their spending on imported goods.

Increased demand on imported goods increases supply of AUD to the global market, AUD depreciates.

2. A **British-made** car is priced at **20,000 pounds** and a comparable **Australian-made** car costs **$26,000**. **One pound trades for $1.50** in the foreign exchange market.

> *Find the real exchange rate for cars from the perspective of Australia and from the perspective of Great Britain. Which country's cars are more competitively priced?*

From the question

British car: £ 20,000

Australian car: $26,000

Exchange rate: 1.5 dollar/pound

If we apply the formula:

$$
\begin{aligned}
q &\equiv e \times \frac{P}{P^f} \\
&= \frac{GBP}{AUD} \cdot \frac{P_{aus}}{P_{eng}} \\
&= \frac{1}{1.5} \cdot \frac{26,000}{20,000} = 0.867
\end{aligned}
$$

which is the price of Australian car relative to British car, vice versa we get 1.154

In AUD

British car costs £ 20,000 × 1.5 = $30,000

Australian car, on the other hand, costs $26,000

If we assume both cars has then same quality, then Australian car is priced more competitively.

In Pound

Australian car costs $26,000/1.5 = £ 17,333

British car, on the other hand, costs £ 20,000

If we assume both cars has then same quality, then Australian car is still priced more competitively.

Either way, we should find Australian car to be cheaper

3. The demand for and supply of shekels in the foreign exchange market is

$$\text{Demand} = 30,000 - 8,000e$$

$$\text{Supply} = 25,000 + 12,000e$$

where the nominal exchange rate is expressed as dollars per shekel.

> *a. What is the **fundamental value of shekel**?*

$$\text{Demand} = 30,000 - 8,000e$$
$$\text{Supply} = 25,000 + 12,000e$$

We find **fundamental value**[1] of a currency by solving for the equilibrium.

$$30,000 - 8,000e = 25,000 + 12,000e$$

$$e = 0.25(\text{dollar}/\text{shekel})$$

1. Fundamental value refers to the price of shekels when there is no shock, i.e. the equilibrium value, so we just solve for the equilibrium price, where demand equals supply.

> b. *The shekel is **fixed at $0.30**. Is the shekel **overvalued, undervalued or neither**? Find the **balance of payments** deficit or surplus in both shekels and dollars. What happens to the country's **international reserves** over time?*

Note: **fundamental value** of shekel is $0.25

Fundamental value of shekel is $0.25, if shekel is fixed at $0.3, then shekel is overvalued.

If we find the corresponding supply and demand:

$$\begin{aligned}\text{Demand} &= 30,000 - 8,000 \cdot 0.3 = 27,600 \\ \text{Supply} &= 25,000 + 12,000 \cdot 0.3 = 28,600 \\ \Delta D/S &= -1,000\end{aligned}$$

Balance of payment deficit for shekels, surplus for dollar

Israel needs to **buy up the excess supply** in shekels, so their international reserves will decrease will lower overtime.

Fundamental value of shekel is $0.25, if shekel is fixed at $0.2, then shekel is undervalued.

If we find the corresponding supply and demand:

$$\begin{aligned}\text{Demand} &= 30,000 - 8,000 \cdot 0.3 = 28,400 \\ \text{Supply} &= 25,000 + 12,000 \cdot 0.3 = 27,400 \\ \Delta D/S &= 1,000\end{aligned}$$

Balance of payment surplus for shekels, deficit for dollar

Israel needs to **print more shekels to meet the excess demand** for shekels, so their international reserves will increase overtime.

5. Using the table taken from the Economist, answer the following questions

The Big Mac index

	Big Mac prices*		Implied PPP† of the dollar	Actual dollar exchange rate July 21st	Under(-)/over(+) valuation against the dollar, %
	in local currency	in dollars			
United States‡	$ 3.73	3.73			
Argentina	Peso 14.0	3.56	3.75	3.93	-5
Australia	A$ 4.35	3.84	1.17	1.13	3
Brazil	Real 8.71	4.91	2.33	1.77	31
Britain	£ 2.29	3.48	1.63 §	1.52 §	-7
Canada	C$ 4.17	4.00	1.12	1.04	7
Chile	Peso 1,750	3.34	469	524	-10
China	Yuan 13.2	1.95	3.54	6.78	-48
Colombia	Peso 8,200	4.39	2,196	1,868	18
Costa Rica	Colones 2,000	3.83	536	522	3
Czech Republic	Koruna 67.6	3.43	18.1	19.7	-8
Denmark	DK 28.5	4.90	7.63	5.81	31
Egypt	Pound 13.0	2.28	3.48	5.70	-39
Estonia	Kroon 32.0	2.62	8.57	12.2	-30
Euro area**	€ 3.38	4.33	1.10 ††	1.28 ††	16
Hong Kong	HK$ 14.8	1.90	3.96	7.77	-49
Hungary	Forint 740	3.33	198	222	-11
Indonesia	Rupiah 22,780	2.51	6,102	9,063	-33
Israel	Shekel 14.9	3.86	3.99	3.86	3

a. Explain some of the advantages and disadvantages of the Big Mac index.

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Advantages

- Big Mac available in many countries
- Big Mac is **always the same** (mostly)
- McDonald's holds **monopolistic power** among most countries
- Nice basis the international comparison

Disadvantages

- Burgers are not traded across borders, no arbitrage to ensure law of one price
- It's pricing depends on the price of local ingredients rather than purchasing power of the currency
- So it's pricing mainly reflects local wages and rents, which is non-tradable or not very mobile

b. On 21 July 2010, the nominal exchange rate was AUD $1 = USD $0.8850 (1.13). On 8 October 2010, the nominal exchange rate was AUD $1 = USD $0.9835 (1.02). Suppose currency speculators read The Economist. Can you ***explain this change in the nominal exchange rate****? Discuss.*

> b. *On 21 July 2010, the nominal exchange rate was AUD $1 = USD $0.8850 (1.13). On 8 October 2010, the nominal exchange rate was AUD $1 = USD $0.9835 (1.02). Suppose currency speculators read The Economist. Can you* ***explain this change in the nominal exchange rate****? Discuss.*

From the table, AUD is overvalued, **1 USD = 1.13 AUD**, **but 1 USD can buy 1.17 AUD worth of good**, so AUD is over-valued.

On 8 Oct 2010, AUD is even more over-valued, as now **1 USD = 1.02 AUD**.

This implies there is some shock made AUD over-valued in the short-run, but when price starts to adjust in the long-run, AUD should no longer be over-valued.

The Big Mac index

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