2604697 Financial Markets, Institutions and Instruments

There are 3 main questions (page 17 to 19). Answer all the questions. The maximum possible points are indicated in each question. The full score is 50 points, and the passing score is 25 points.

Question 1: Under a managed float exchange rate system, **a)** how could the central bank intervene foreign exchange market to keep the value of its currency low? **b)** What are the likely impacts of this policy on the country's reserve assets, inflation and terms of trade? **c)** How could the country use open market operation (OMO) to reduce the impacts of foreign exchange market intervention on domestic inflation? and **d)** How would the OMO implemented in c) potentially defeat the purpose of the foreign exchange market intervention implemented in a)? Explain *[20 points]*

(a) Central bank can intervene foreign exchange market (FX intervention) by selling domestic currency to keep value of domestic currency low. After they sell domestic currency, the demand curve of foreign currency shift right and causes value of domestic currency to remain low.

(b) Foreign reserve increases as central bank receives foreign currency from selling domestic currency. This causes domestic inflation rate to increase and trade surplus (export is higher than import due to devalue of domestic currency).

(c) Central bank can lower the impact of FX intervention by selling domestic government bond. This causes the price of bond to decrease and yield to increase. Thus, the domestic currency appreciates. FX intervention + OMO = sterilized FX intervention.

(d) The increase in yield from OMO could attract foreign capital and causes HC to appreciate. This effect could outweight the impact of devaluation on HC from FX intervention.

* International parity condition

① PPP

- absolute purchasing power parity : $S_t^{HC/FC} = \frac{P_{H,t}}{P_{F,t}} = \frac{CPI_{H,t}}{CPI_{F,t}}$ ↳ fail in empirical tests as baskets of goods & services are not the same for each country.
- Relative PPP : $\frac{S_t^{HC/FC}}{S_0^{HC/FC}} = \frac{(1+\pi_H)^t}{(1+\pi_F)^t}$ ⇒ change in foreign ($t=1$) exchange rate ≈ $\pi_H - \pi_F$ (inflation differential)

$\frac{P_{F,t}}{P_{F,0}}$; expected

↳ if > 1 ; Foreign will enjoy price advantage over domestic G&Ss

↳ TH competitiveness ↓ → export ↓ → trade deficit → Foreign currency becomes stronger → benefit from lower π_F cancel ↓ equilibrium

- Real exchange rate:

Absolute : $S^* = S^{H/F} \times \frac{P_F}{P_H}$ → In equilibrium, $S^* = 1$ (unitless)

if $S^* > 1$, P_F is too expensive → lose competitiveness ↓ FC depreciates

Relative : $S^* = S_t^{H/F} \times \frac{(1+\pi_F)^t}{(1+\pi_H)^t}$ ↓ holds in long-run

S_{80} = ¥226.63/$ > nominal exchange rate

S_{95} = ¥93.96/$

↳ expects higher π_{US} → cancelled the price competitiveness of US

lose out price competitiveness bcs they need to rise foreign price of product to maintain margin when exchange rate becomes ¥93.96/$

2.3 Real Exchange Rate

15 yrs later

- EX: Between 1980–1995, $S_0^{¥/\$}$ had dropped from ¥226.63 to ¥93.96/$. During the 15 years period, the U.S. CPI has risen from 82.4 to 152.4, while CPI in JP has risen from 91.0 to 119.2. $\frac{CPI_{US,95}}{CPI_{US,80}} = \frac{152.4}{82.4}$ } $1+\pi_{US} = 1.85$ (per 15 yrs; US has high π as expected) | $\frac{CPI_{JP,95}}{CPI_{JP,80}} = \frac{119.2}{91.0}$ } $1+\pi_{JP} = 1.31$
  - If PPP holds over this period, what would $S^{¥/\$}$ be in 1995? (check whether PPP hold)
    - $E[S_{1995}^{¥/\$}] = ¥160.51/\$ = S_{80}^{¥/\$} \times \frac{1.31}{1.85}$ (S_{80} = 226.63) * actual $S_{95}^{¥/\$}$ is ¥93.96/$ nominal rate for US depreciates too much
    - * US manufactures will gain price competitiveness
  - What happened to the real value of ¥ in terms of $ during this period? real exchange rate on dollar → smaller ↳ dollar becomes too weak in real term
    - For USD, $S_{1980}^* = 226.63$, and $S_{1995}^* = 132.67$ ← $S_{1995}^* = S_t^{¥/\$} \times \frac{(1+\pi_{US})}{(1+\pi_{JP})} = 93.96 \times \frac{1.85}{1.31}$ (US manufacturers gain price competitiveness)
    - For JPY, $S_{1980}^* = 0.0044$, and $S_{1995}^* = 0.0075$ ← $\frac{1}{93.96} \times \frac{1.31}{1.85}$
  - Who had lost price competitiveness?

change foreign price ↑ → quantity demand may not change due to inelastic product

US is expected to have less deficit against Japan as it gain price competitiveness

need to relocate their factories to other country

BUT actual → US has more deficit against Japan → bcs US economy ? → wage ↑ → loss price competitiveness

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Focus on 1st real competitiveness

↳ labor skill, infrastructure, regulation

② International Fisher Effect (IFE)

$$\frac{E[S_t^{H/F}]}{S_0^{H/F}} = \frac{(1+i_H)^t}{(1+i_F)^t}$$ → current interest differential

- If $i_H > i_F$ → mkt expects HC to depreciate over time

Ex Investment in H vs. F, given $i_H = 5\%$ pa, $i_F = 8\%$ p.a., $S_0 = 30$ B/$, $E[S_1] = 30$ B/$

	t_0	t_1
① invest THB 1 @ i_H p.a.	-1	$+1(1+i_H)$
② invest THB 1 @ i_F p.a.	$-1/S_0^{H/F}$	$+\frac{1}{S_0^{H/F}}(1+i_F)$

$$\Downarrow$$

$$+\frac{1}{S_0^{H/F}}(1+i_F) \times E[S_t^{H/F}]$$

should be equal at equilibrium

$$\frac{E[S_t^{H/F}]}{S_0^{H/F}} = \frac{(1+i_H)}{(1+i_F)}$$

if this is greater → capital outflow to US

$$\Downarrow$$

$i_H \uparrow$, $S_0^{H/F} \uparrow$, $i_{US} \downarrow$

Question 2: An Australian firm is considering whether to borrow money in AUD or JPY for 9 months. The current interest rate on JPY-loan is 4.0% pa, while AUD-loan is 6.0% pa. The current exchange rate between JPY and AUD is ¥69.94/A$. The firm forecasts that AUD will depreciate to ¥69.10/A$ at the end of month nine. *[15 points]*

higher int rate → depreciates

AUD depo

2.1) Given that the objective is to borrow at the lowest expected interest rate, which currency should the firm borrow? (Show your calculation and answer to 4 decimal place)

▷ According to International Fisher Effect (IFE): $\frac{E[S_t^{HC/FC}]}{S_0^{HC/FC}} = \frac{(1+i_H)}{(1+i_F)}$

	t_0	t_1 (cost of borrowing in AUD)
① Borrow AUD loan	+ AUD 1	$-\text{AUD } 1 \times \left(1+\left(6\% \times \frac{9}{12}\right)\right) = 1.0450$
② Borrow JPY loan	+ JPY 69.94	$-\text{JPY } 69.94 \times \left(1+\left(4\% \times \frac{9}{12}\right)\right) \times \frac{1 \text{ AUD}}{69.10 \text{ JPY}}$

$= 1.0425$

∴ cheaper → borrow JPY loan

2.2) Apart from the level of interest rate (as answered in Question 2.1), how could foreign exchange rate risk consideration also play an important role in making the above decision? Explain.

- There is a risk that JPY might appreciate. In this case, due to foreign exchange risk, the interest and principal payment may become more expensive in AUD compared to AUD loan.

③ Interest rate parity : $\frac{F_0^{HC/PC}}{S_0^{HC/PC}} = \frac{(1+i_H)^t}{(1+i_F)^t}$

$i_H > i_F$ forward premium $F > S_0$

$i_H < i_F$ forward discount $S_0 > F$

Compare this two :

* Bid-ask spread
  - bid-ask spread in interbank
  - liquidity risk
  - exchange rate risk
  - customer's spread

Question 3: Today is Monday 15th June 20XX. A bank quotes the following exchange rates. Use these rates to answer the following questions. (Note: answer all questions to 4 decimal points) *[15 points]*

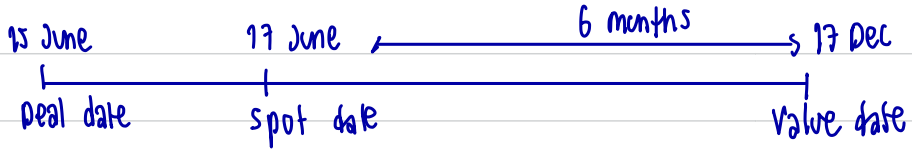
USD/SGD spot rate ($S_0^{S\$/U\$}$):	0.9450 / 0.9820 SGD per USD
3-Month swap points:	+0.0120 / +0.0140 SGD per USD
6-Month swap points:	+0.0250 / +0.0275 SGD per USD

3.1) A customer wants to buy SGD 38,000 against USD spot. How many USD does it cost? When is the settlement date? *[5 points]*

- SGD/USD spot rate = $\frac{1}{0.9820}$ / $\frac{1}{0.9450}$ = 1.0183 / 1.0582 USD per SGD
- USD used to buy SGD 38,000 = 38,000 × 1.0582 = USD 40,211.6402

3.2) A Singapore importer has outstanding USD-account payables value at U$5,000,000 dues in 6 months' time. The importer would like to buy USD-Forward to hedge this account payables. What is the forward rate that the importer will get? When is the settlement date? *[5 points]*

- 6-Month forward rate $F_{6m}^{S\$/U\$}$ = 0.945 + 0.025 / 0.982 + 0.0275 SGD per USD
  0.9700 / 1.0095 SGD per USD
- Forward rate that Importer will get is 1.0095 SGD per USD



$i_{SGD}^{H} > i_{USD}^{F}$

3.3) As the bank quotes USD at a forward premium, the Singapore importer is better off buying USD spot rather than forward (i.e., the spot rate for USD is cheaper than the forward rate). Do you agree with this idea? Discuss. *[5 points]*

I don't agree with this idea. According to interest rate parity, forward exchange rate is traded at premium because USD interest rate is lower than SGD interest rate. Thus, if the firm buy USD spot, they will not receive benefit of higher domestic interest. Thus, forward premium is offset by lower interest rate.

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Question 1: What is the Trinity of Impossibility? When countries in the Eurozone chose to adopt the single currency (the Euro), what did they expect to achieve and what did they have to sacrifice in terms of the Trinity of Impossibility? Explain [20 points]

- Trinity of impossibility is three achieves that each currency system can obtain only 2 out of 3 achieves. The 3 achieves include high level of capital mobility, stabilized foreign exchange rate, and independence of monetary policy.
- When countries in the Eurozone chose to adopt "Euro" as a single currency, the risk of volatility of foreign exchange rate within Eurozone becomes zero. Moreover, it reduce the transaction cost and the need to hedge against exchange rate risk. However, they cannot devalue Euro because Euro does not belong to any country. Thus, they need to give up on independence of monetary policy as a tool for solving internal problem.

Question 3: What are Momentum and Contrarian effects in capital markets? Why are they considered efficient market anomalies (i.e., supporting the notion that the market is not efficient)? What could be a possible explanation for these phenomenon? *[15 points]*

- Momentum effect is that top rank stocks tend to perform good again in the next period over the short to medium term. This effect is a weak form test of EMH.
- Contrarian effect: stocks with high return over past 5 yr under-perform stocks with poor past return

Momentum and Contrarian Effects in Capital Markets:

Momentum and contrarian effects are two phenomena in financial markets that illustrate deviations from the Efficient Market Hypothesis (EMH), suggesting that markets may not always be efficient.

Momentum Effect:

Definition: The momentum effect suggests that assets which have performed well in the past will continue to perform well in the short to medium term, whereas assets that have performed poorly will continue to underperform.
Empirical Evidence: Studies, such as those by Jegadeesh and Titman (1993), have found that portfolios of stocks with high returns over the past 3 to 12 months typically continue to outperform.
Market Anomaly: This effect is considered a market anomaly as it contradicts the EMH, which posits that current prices reflect all available information. If true, past performance should not be indicative of future returns.
Contrarian Effect:

Definition: The contrarian effect involves betting against prevailing market trends, often by buying poorly performing assets and selling well-performing ones.
Empirical Evidence: Researchers like DeBondt and Thaler (1985) discovered that stocks that perform poorly over a long period tend to outperform the market later, and vice versa.
Market Anomaly: This effect challenges the EMH by suggesting that markets overreact to information, leading to mispricing that reverses over time.
Possible Explanations for These Phenomena:

Several theories have been proposed to explain why momentum and contrarian effects occur, despite the assumptions of market efficiency:

Investor Psychology:

Behavioral Biases: Investors may exhibit behaviors driven by psychological factors such as herd behavior, overconfidence, or anchoring, leading to prolonged trends or sudden reversals in stock prices.
Delayed Reaction to News: Investors might not react immediately to new information, causing a delay in price adjustments which momentum traders can exploit.
Market Microstructure:

Liquidity and Trading Constraints: Sometimes, trades cannot be executed immediately due to liquidity constraints, leading to delays in price adjustments that give rise to momentum and contrarian opportunities.
Information Asymmetry: Not all investors receive information at the same time, and those with earlier access can trade on it before it's fully reflected in the market prices.
Risk-Based Explanations:

Higher Risk, Higher Return: Some argue that stocks exhibiting momentum or contrarian patterns might have higher risks associated with them, which are not captured by traditional risk measures, thus demanding higher returns.
In conclusion, momentum and contrarian effects challenge the notion of an efficient market as they imply predictable patterns in returns based on past performance, contrary to what EMH would predict. These effects underscore the complexities of market dynamics where psychological factors and market structures play significant roles.