COMM 220
Final Review Outline
2015
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[Chapter 1] Market Analysis

① Positive v.s. Normative Analysis
(Cause & Effect) ("should")

② Competitive v.s. Non-competitive Markets
(Price takers → consumers) ("monopoly")

③ Real v.s Nominal Price

		1970 (base)	2015 (non-base)
Nominal ←	Price	$30	$80
	CPI	125	325
Real ←	Price	a	b

Base year: Nominal Price = Real Price
a = $30

Non-base year: Calculation needed
$b = \frac{125}{325} \times 80 = \$30.769$

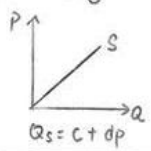
④ Percentage Change

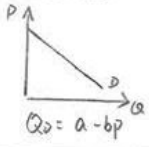
$$\Delta\% = \frac{\text{New} - \text{old}}{\text{Old}}$$

- Real Price = $\frac{\text{CPI in base year}}{\text{CPI in non-base year}}$ x nominal price of non-base year
- $\Delta\%$ in CPI = $\Delta\%$ in Real Price

[Chapter 2] Basic Supply & Demand

① Supply & Demand Curve





② Influencing Factors:

- Supply: Cost of production, interest rate, technology, expectation ...
- Demand: Income, season, wether, price of complements/substitutions, interest rates...

③ Elasticity

1) Price Elasticity (E^P)

$$E^P = \frac{\%\Delta Q}{\%\Delta P} = \frac{\Delta Q}{\Delta P} \times \frac{P}{Q}$$

- $E^P > 1$ Elastic
- $E^P < 1$ Inelastic
- $E^P = 1$ Unit elastic
- $E^P = 0$ Completely Inelastic
- $E^P = \infty$ Infinitely Elastic

2) Income Elasticity (E^I)

$$E^I = \frac{\%\Delta Q}{\%\Delta I} = \frac{\Delta Q}{\Delta I} \times \frac{I}{Q}$$

- $E^I > 0$ Normal Goods
- $E^I = 0$ Neutral Goods
- $E^I < 0$ Inferior Goods (Potatoes)

3) Cross-Price Elasticity ($E_{Q_A P_B}$)

$$E_{Q_A P_B} = \frac{\%\Delta Q_A}{\%\Delta Q_B} = \frac{\Delta Q_A}{\Delta P_B} = \frac{P_A}{Q_B} \times \frac{\Delta Q_B}{\Delta P_A}$$

- $E_{Q_A P_B} > 0$ Substitutions
- $E_{Q_A P_B} < 0$ Complements

4) Arc Elasticity (E_{Arc})

$$E_{Arc} = \frac{\Delta Q}{\Delta P} \cdot \frac{\bar{P}}{\bar{Q}} = \frac{\%\Delta Q}{\%\Delta P} \rightarrow \frac{Q_2 - Q_1}{(Q_2 + Q_1)/2} \rightarrow \frac{P_2 - P_1}{(P_2 + P_1)/2}$$

④ Given: $\begin{cases} Q_D = a - bP \\ Q_S = c + dP \end{cases}$

1) Equilibrium Point?
2) If Q_D increased by 10%, new equilibrium point?
3) If P_D increased by 10%, new equilibrium point?

- When they ask you to calculate new equilibrium point if P changed

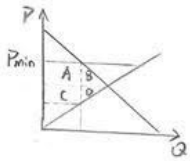
REFORMAT $Q = a - bP \Rightarrow P = \frac{a}{b} - \frac{Q}{b}$ then times percentage change

【 Chapter 3 】 Influence on Supply & Demand

① Consumer v.s. Producer Surplus

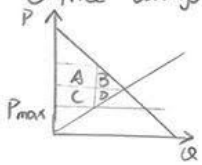
- Δ Social Welfare = ΔCS + ΔPS + Government Revenue − Cost to the government
- Deadweight Loss = − Δ Social Welfare

② Price Floor



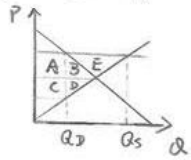
ΔCS = −A−B
ΔPS = A−D
DWL = B+D
ΔWF = −B−D

③ Price Ceilings



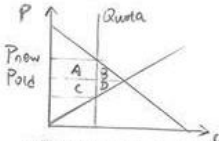
ΔCS = C−B
ΔPS = −C−D
DWL = B+D
ΔWF = −B−D

④ Price Support



ΔCS = −A−B
ΔPS = A+B+E
Cost to gov. = $(Q_S - Q_D) \times P$
ΔWF = $E - (Q_S - Q_D) \times P$

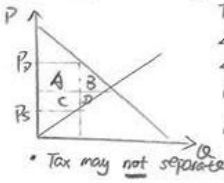
⑤ Quotas (limit the quantity)



ΔCS = −A−B
ΔPS = A−D
DWL = B+D
ΔWF = −B−D

- Producers are limited to produce less, as a result, the price goes up since the demand is high

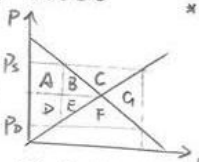
⑥ Taxes



* Tax = $P_D - P_S$
ΔCS = −A−B
ΔPS = −C−D
Gov. Revenue = A+C = Tax × Quantities
DWL = B+D

- Tax may not separate evenly to demand & supply

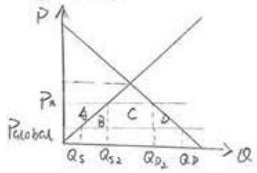
⑦ Subsides



* Subsides = $P_S - P_D$
ΔCS = D+E+F
ΔPS = A+B+C
Cost to gov. = A+B+C+D+E+F+G
ΔWF = −G

- P_S, P_D are opposite from "taxes"

⑧ Tariff



P_X : The global price with tariff
Tariff = $P_X - P_{global}$
ΔCS = −A−B−C−D
ΔPS = A
Gov. Revenue = C = $(Q_{D_2} - Q_{S_2}) \times$ Tariff
DWL = B+D

[Chapter 4] Labour Market

① Job Market { National / Internal / Local

② Labour Force = Employed + Unemployed

③ Not in Labour Force = Retired + Under 15 + Not looking for work ...

④ Labour Force Participation = $\frac{\text{Labour Force}}{\text{Population}}$

⑤ Unemployment Rate = $\frac{\text{Unemployed}}{\text{Labour Force}}$

⑥ When capital price goes down :

Scale Effect	Substitute Effect
Price of K ↑	Price of K ↓
Production cost ↓	Substitute L for K
Price for firms charging ↓	Labour demand ↓
Consumers' consume ↑	
Production ↑	
Labour demand ↑	

- Only in the long run

[Chapter 5] Marginal Revenue

① Short-run: $MR(MRP_L) = MC(w)$

$MRP_L = \text{Price} \times MP_L$

$MRP_K = \text{Price} \times MP_K$

Max Revenue: $MRP_L = w$

② Long-run:

$$\frac{MP_L}{MP_K} = \frac{w}{c} = MRTS$$

③ Total Cost = $w \times L + c \times K$

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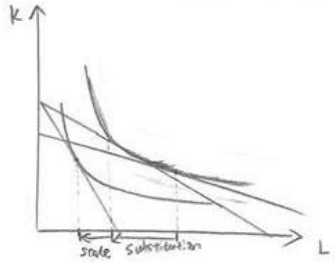
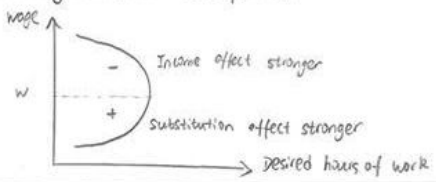
④ Long Problem Solving Procedure:

1) Find the marginal rate of technical substitution $\Rightarrow MRTS = \frac{MPL}{MPK}$
2) Find the optimal input ratio $\Rightarrow MRTS = \frac{w}{c}$
3) Units were given, calculate input mix:
   - Find relationship between K and L by using $MRTS = \frac{w}{c} \Rightarrow K = aL$
   - Put $K = aL$ into quantity function, eg. $Q = 50K^{1.23}L^{0.5}$
   - Calculate K or L then use $K = aL$ getting another one
4) Calculate 3)'s cost $\Rightarrow TC = w \times L + c \times K$
5) Cost were given, calculate input mix
   - Find relationship between K and L by using $MRTS = \frac{w}{c} \Rightarrow K = bL$
   - Put $K = bL$ into cost function $TC = w \times L + c \times K$
   - Calculate K or L then use $K = bL$ getting another one
6) Calculate 5)'s quantity $\Rightarrow Q = 50K^{1.23}L^{0.5}$
7) Find substitution effect and scale effect
   - Substitution effect:
     Same isoquant (curve), different isoexpenditure (line)
   - Scale effect:
     Same isoexpenditure, different isoquant



[Chapter 6] Leisure & Work

① Utility: Labour satisfaction



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② Individual utility curve:

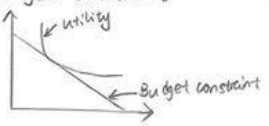
③ 4 principles:

1) utility curves cannot intersect
2) they are negatively sloped
3) utility are convex → when you have more wages, you evaluative leisure time more
4) Everyone's utility curve is different

④ Income Effect = $\frac{\Delta H}{\Delta Y} \Big| \bar{w}$

⑤ Substitution Effect = $\frac{\Delta H}{\Delta w} \Big| \bar{Y}$

⑥ Budget Constraint



- Must be clear how to plot the figure
- Don't confuse Leisure time and work time in questions

[Chapter 7] Uncertainty & Risk

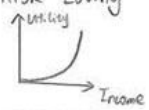
① Risk = σ = $\sqrt{\text{variance}}$ = standard deviation = Volatility

How to distinguish?

$U = I^a$ { $a>1$ ↗ loving; $a=1$ → neutral; $0<a<1$ ↘ averse

$U = \log I$ ↘ averse

② Risk Loving



More Risk!

Risk Neutral

I don't care.

Risk Averse

Oh hell, no.

③ 3 ways to averse risk:

1) Diversification: Risky + Risk free
2) Insurance
3) Gain more Information

④ Risk of Portfolio:

- $R_p = R_f + b(R_m - R_f)$
- $b = \frac{\sigma_{portfolio}}{\sigma_{risky}}$
- $R_p = R_f + \frac{(R_m - R_f)}{\sigma_m} \times \sigma_p$

$m \rightarrow$ Risky assets
$f \rightarrow$ Risk free assets
$\sigma \rightarrow$ Risk

- If $b > 1$, that means you "borrow" money from others.
- $\sigma_p = W_1\sigma_m + W_2\sigma_f = w_1\sigma_m + (1-w_1)\sigma_f = w_1\sigma_m + (1-w_1)\times 0 = w_1\sigma_m$
  ($\sigma_f = 0$) This function may be used when they ask you to calculate the proportion invested in each of the assets.

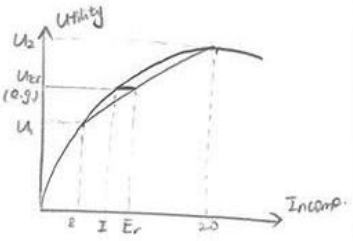
⑤ ※ Distinguish:

- Expected Return:
  $E_{(r)} = 30\% \times \$8 + 70\% \times \$20 = \$16.4$ (Return)
- Expected Utility of Return:
  $U_{Er} = 30\% \times U_1 + 70\% \times U_2 = U'$ (utility)
- Utility of Expected Return:
  $U = 20I^3 = 20E_r^3$ (utility)

⑥ Long problem solving procedure:

Determine the "Risk Premium"

1) Find Expected Return => $E_r = 30\% \times 8 + 70\% \times 20 = 16.4$ (e.g.)
2) Find Expected Utility of Return
   => $U_{Er} = 30\% \times U_1 + 70\% \times U_2$
3) Put 2) into Utility function $U = 20I^3$ (e.g.)
   Let $U = U_{Er}$, find I
4) Risk premium = $E_r - I$



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[Chapter 8] Financial Market

① Direct (Face to face) v.s. Indirect (Intermediaries) Market

② Primary (First Issuer) v.s. Secondary (Stock market) Market

③ Money (short term, < 1 year) v.s. Capital (Long term) Market

④ Equity Market
- Primary Market → IPO = Initial Public Offering → Investment Banks
- Secondary Market
  - Connect with sellers & buyers → Brokers
  - OTC = Over the counters → Dealers

⑤ Financial Intermediaries' advantages
1) Transaction costs are reduced
2) Decreasing risks (experts) { Systematic / Unsystematic
3) They solve agency costs
4) "Economics of scope"

⑥ Types of Financial Intermediaries
- Depository Institutions
- Contractual Savings Institutions
- Investment Intermediaries

⑦ Internationalization:

Foreign Bonds: German (different) —issue→ (CAD) —in (same)→ Canada

Eurobond: German (different) —issue→ (USD) —in (different)→ Canada

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【Chapter 9】 Financial Structure

① Important points in "Eight Basic Facts"

- Indirect Finance > Direct Finance
- Financial Intermediaries are the primary way in which businesses finance their operations
- Financial structure is often used by BIG firms since it's costly

② Agency Costs / Asymmetric Information

1) Adverse Selection
   - Have no idea what will happen before get into the market
   - Lemon Problem

2) Moral Hazard
   - Some unfavorable things may happen after signing the contract.

3) Principal Agent
   - Conflict between managers and shareholders.

③ Ways to Solve Asymmetric Information Problem

- Financial Intermediaries
- Audits, more information → Free-rider problem
- Government regulation
- Issue debt only

【Chapter 10】 Bonds & Interest

① Present & Future Value:

$$PV = \frac{CF}{(1+i)^n}$$

PV = Today's present value
CF = Future cash flow or payments
I = Interest rate
n = years.

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② 5 Types of Credit Market Instruments:

1) Simple Loan : payback "principle + interest" in the end

2) Fixed Payment Loan : Certain "principal + interest" repayment in each period

3) Coupon Bond : Buy a bond at face value, then fixed repayment (interest) every period, get principal in the end.

4) Discount Bond: Buy a bond for less than $1000 (face value) and get $1000 in the end.

5) Consol Bond (Perpetuity) : no principal repayment, get interest repayment every period and forever.

③ Capital Gains :

$$\text{Capital Gains} = \frac{\text{Selling Price} - \text{Purchasing Price} + \text{Coupon (if have)}}{\text{Purchasing Price}} = \frac{\text{New} - \text{Old}}{\text{Old}}$$

④ YTM (Yield to Maturity)

Rate of return from bond if you hold until maturity

⑤ Fisher Equation :

Real Interest = Nominal Interest − Experted Inflation

[Chapter 11] Demand / Supply of Assets / Bonds

① Demand Assets : ·

Wealth	+, +
Expected Return	+, +
Risk	+, −
Liquidity	+, +

② Supply Assets :

"Central Bank"

③ Demand Bonds :

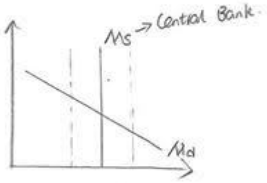
Wealth	+, +
Expected Return	+, −
Expected Inflation	+, −
Risk	+, −
Liquidity	+, +

④ Supply Bonds :

Expected profitability of Investment	+, +
Expected Inflation	+, +
Government Activities :	
Deficits	+
Surpluses	−

⑤ Keynes: Liquidity effect $M_S \uparrow R_I \downarrow$

Fredman: Liquidity effect
+ Income effect
+ Price level effect
+ Exect Inflation effect
$\} M_S \uparrow R_I \uparrow$



【 Chapter 12 】 Interest Rates

① Term Structure :

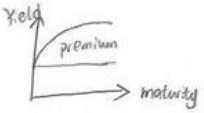
1) Expectation Theory: $\frac{R_{S1} + R_{S2}}{2} = R_L$ S- short term L- long term

2) Segmented Market Theory :

Short term or long term? Based on individual preferences.

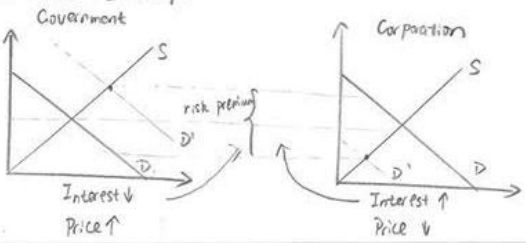
3) Liquidity Premium Theory :

Time is risk. The longer time, the more risk.



4) Preferred Habitat Theory.

② Default Risk: Bankrupt



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⑤ Liquidity:

Government	Corporation
Price ↑	Price ↓
Interest ↓	Interest ↑

- We can easily turn risk free things into cash, thus, we demand more risk free things.

④ Income tax Considerations:

With tax → higher interest
Without tax → Lower interest

⑤ Spot Rate: Rate that you can see and invest today

Forward Rate: Rate that you cannot see but invest today

$$(1+fn) = \frac{(1+fn)^n}{(1+f_{n-1})^{n-1}}$$

⑥ Interest with premium (Expected yield under liquidity premium theory)

$$\frac{\text{Sum of yearly interest rate}}{\text{Number of years}} + \text{Premium (rate)} = \text{Yield}$$

- Be careful when they ask you interest calculation questions, see they are asking liquidity premium theory or expectation theory.

[Chapter 13] International Integration

① Elements { Trade Flows; Capital Flows; People (labour) Flows; Similarity/ Price Flows

② Trade to GDP:

$$\text{Trade to GDP ratio} = \frac{\text{Exports} + \text{Imports}}{\text{GDP}}$$

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③ Shallow Integration : Remove of barriers

Deep Integration : Modifying global polices

【Chapter 14】 Trading (Long problem Solving Procedure)

① Read the question and draw the form:

		Company A	Company B
Product N		①	②
Product M	(Goods you want to trade)	③	④
		Rate A = ①/③	Rate B = ②/④

- The number of goods that you want to trade will be the denominator.

② Who has Absolute Advantage ⇒ Compare ① & ③ , ② & ④

- The one who has bigger amount has absolute advantage

③ Who has Comparative Advantage ⇒ Compare Rate A & Rate B

- The one who has lower Rate has comparative advantage
- Be careful which good they want you to compare.

④ Now giving trade condition : Trade β units M at a price of Rate C

※ 3 things you need to find from the trade condition:

① What you want to trade ?

② Trade how many units ?

③ at what price ?

Suggest company B will produce the product M since Rate B < Rate A

Draw the Gain & Loss Form:

	Company A	Company B
Gain	β x Rate A	β x Rate C
Loss	β x Rate C	β x Rate B
Difference	a	b

※ The company who will produce the product will gain trading units x trading price since they have solden it. The company who buy the product will lose the same amount because they have spent the money.

Economic (Business) Gain / loss = a + b

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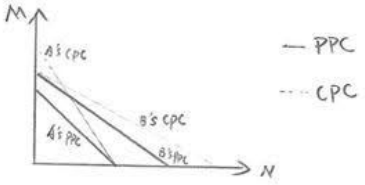
④ Draw PPC / CPC



- PPC shows the substitute relationship between two products
- The difference between PPC & CPC is the opportunity cost

[Chapter 15] Exchange Rate

① Reason for trading currency:

Arbitrage ; Investment ; Speculation

② Forward exchange rate:

$$\frac{E_{P_1}}{P_0} = \frac{1+r_d}{1+r_f}$$

E_{P_1} = Forward exchange rate in one year
P_0 = Spot exchange rate today
r_d = Interest rate for domestic
r_f = Interest rate for foreign

※ ③ Long Problem Solving Procedure:

Question: The one-year interest rate is 2.09% in Canada and 2.83% in Germany. The spot price of the Euro today is $1.3230

a) What is the expected value of the Euro in a year? ⇒ Forward rate

$$\frac{E_{P_1}}{P_0} = \frac{1+r_d}{1+r_f} \Rightarrow \frac{E_{P_1}}{1.3230} = \frac{1+2.09\%}{1+2.83} \Rightarrow E_{P_1} = 1.3135$$

- Be careful which one is r_d and which one is r_f.

b) How would you arbitrage the market with $1 million Canadian if the one-year forward price of the Euro is $1.3168? How much arbitrage profit you would make on this transaction?

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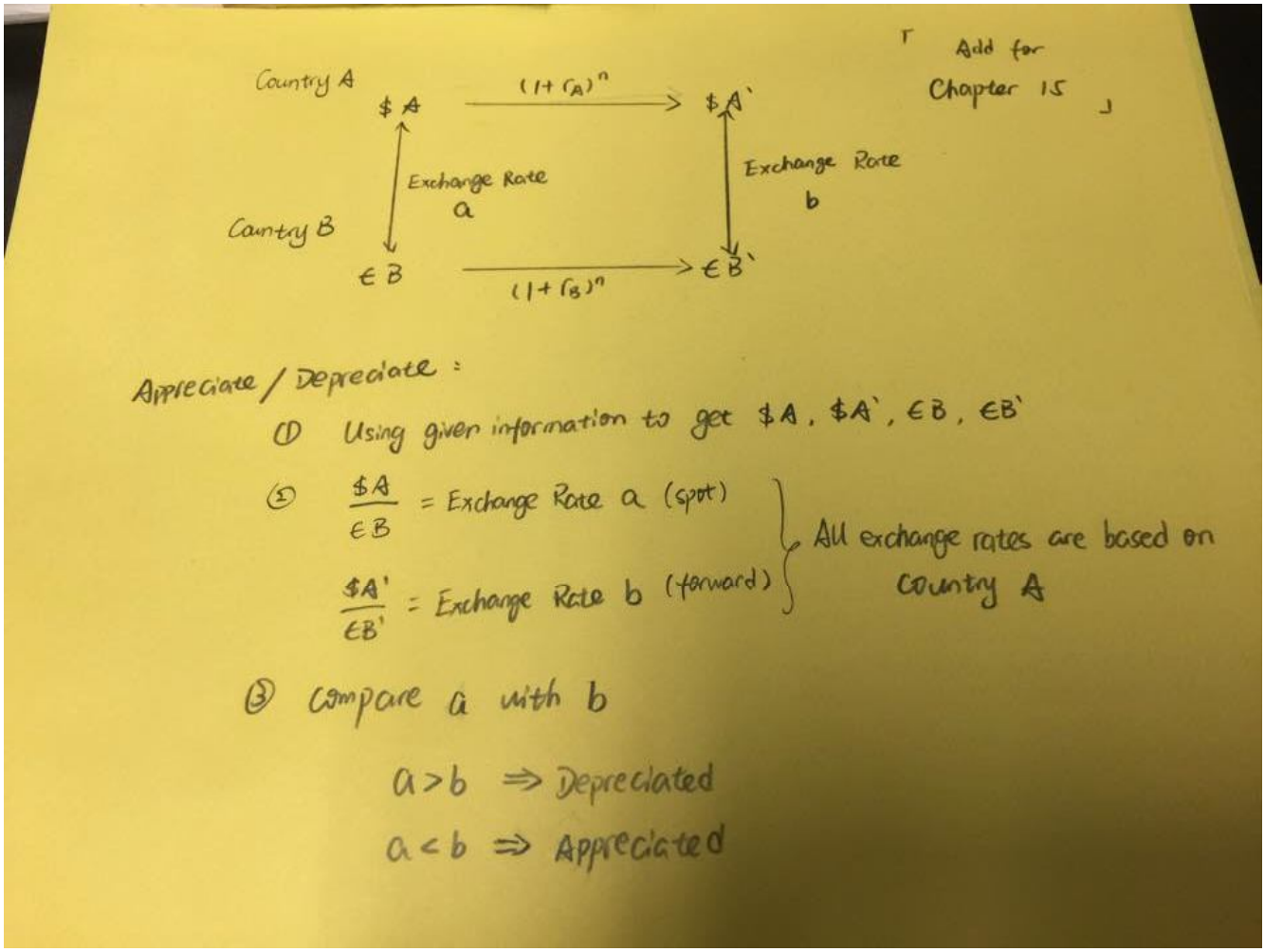

Appreciate / Depreciate :

① Using given information to get $A, $A', €B, €B'

② $\frac{\$A}{€B}$ = Exchange Rate a (spot)

$\frac{\$A'}{€B'}$ = Exchange Rate b (forward)

} All exchange rates are based on country A

③ Compare a with b

$a > b \Rightarrow$ Depreciated

$a < b \Rightarrow$ Appreciated