

【 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

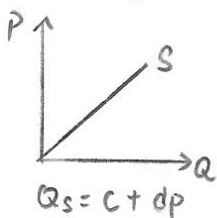
$$\Delta\% = \frac{\text{New} - \text{old}}{\text{old}}$$

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

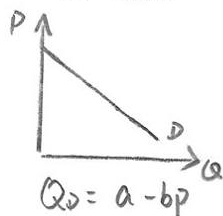
COMM 220
 Final Review Outline
 2015
 Kevin Liu
 L_yuanch@live.concordia.ca

【 Chapter 2 】 Basic Supply & Demand

① Supply



& Demand Curve



② Influencing Factors:

- Supply: Cost of production, interest rate, technology, expectation ...
- Demand: Income, season, weather, 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 ($E_{Q_A P_B}$)

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

- $E_{Q_A P_B} > 0$ 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 $\underline{Q_D}$ increased by 10%, new equilibrium point?

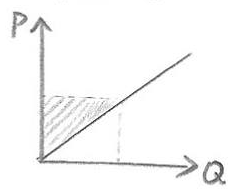
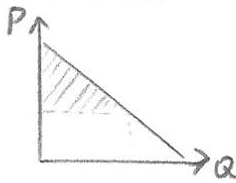
3) If $\underline{P_D}$ increased by 10%, new equilibrium point?

- When they ask you to calculate new equilibrium point if \underline{P} changed.

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

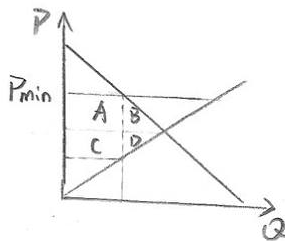
Chapter 3 Influence on Supply & Demand

① Consumer v.s. Producer Surplus



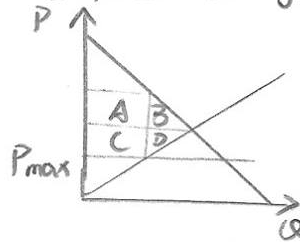
- $\Delta \text{Social Welfare} = \Delta \text{CS} + \Delta \text{PS} + \text{Government Revenue} - \text{Cost to the government}$
- $\text{Deadweight Loss} = -\Delta \text{Social Welfare}$

② Price Floor



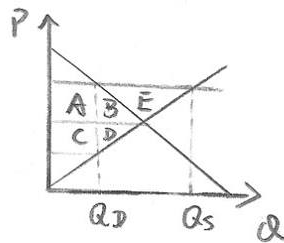
$$\begin{aligned} \Delta \text{CS} &= -A-B \\ \Delta \text{PS} &= A-D \\ \text{DWL} &= B+D \\ \Delta \text{WF} &= -B-D \end{aligned}$$

③ Price Ceilings



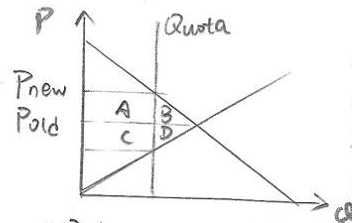
$$\begin{aligned} \Delta \text{CS} &= C-B \\ \Delta \text{PS} &= -C-D \\ \text{DWL} &= B+D \\ \Delta \text{WF} &= -B-D \end{aligned}$$

④ Price Support



$$\begin{aligned} \Delta \text{CS} &= -A-B \\ \Delta \text{PS} &= A+B+E \\ \text{Cost to gov.} &= (Q_S - Q_D) \times P \\ \Delta \text{WF} &= E - (Q_S - Q_D) \times P \end{aligned}$$

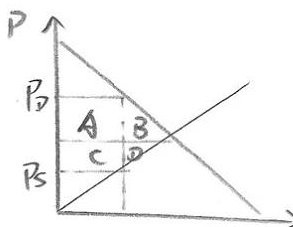
⑤ Quotas (Limit the quantity)



$$\begin{aligned} \Delta \text{CS} &= -A-B \\ \Delta \text{PS} &= A-D \\ \text{DWL} &= B+D \\ \Delta \text{WF} &= -B-D \end{aligned}$$

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

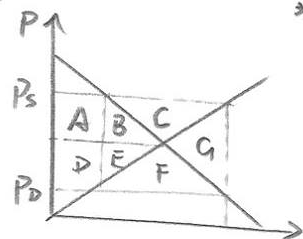
⑥ Taxes



$$\begin{aligned} * \text{Tax} &= P_D - P_S \\ \Delta \text{CS} &= -A-B \\ \Delta \text{PS} &= -C-D \\ \text{Gov. Revenue} &= A+C = \text{Tax} \times \text{Quantities} \\ \text{DWL} &= B+D \end{aligned}$$

- Tax may not separate evenly to demand & supply

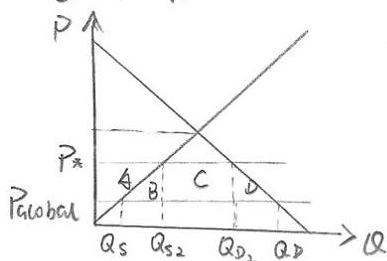
⑦ Subsidies



$$\begin{aligned} * \text{Subsidies} &= P_S - P_D \\ \Delta \text{CS} &= D+E+F \\ \Delta \text{PS} &= A+B+C \\ \text{Cost to gov.} &= A+B+C+P+E+F+G \\ \Delta \text{WF} &= -G \end{aligned}$$

- P_S, P_D are opposite from "taxes"

⑧ Tariff



P_x : The global price with tariff

$$\begin{aligned} \text{Tariff} &= P_x - P_{\text{Allobal}} \\ \Delta \text{CS} &= -A-B-C-D \\ \Delta \text{PS} &= A \\ \text{Gov. Revenue} &= C = (Q_{D2} - Q_{S2}) \times \text{Tariff} \\ \text{DWL} &= B+D \end{aligned}$$

【Chapter 4】 Labour Market

- ① Job Market $\left\{ \begin{array}{l} \text{National} \\ \text{Internal} \\ \text{Local} \end{array} \right.$
- 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

Price of K ↓
Production cost ↓
Price for firms charging ↓
Consumers' consume ↑
Production ↑
Labour demand ↑

Substitute Effect

Price of K ↓
Substitute L for K
Labour demand ↓

- Only in the long run

【Chapter 5】 Marginal Revenue

- ① Short-run: $MR (MRP_L) = MC (w)$

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

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

$$\text{Max Revenue: } MRP_L = w$$

- ② Long run:

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

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

⊕ Long Problem Solving Procedure:

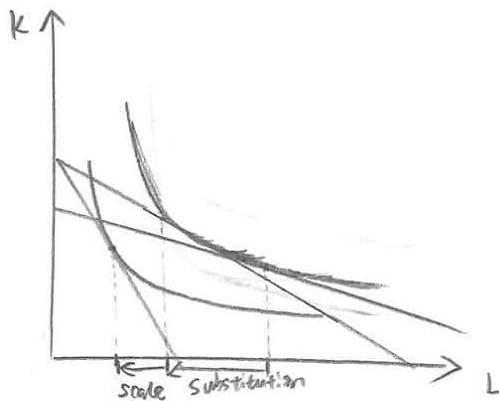
- 1) Find the marginal rate of technical substitution $\Rightarrow MRTS = \frac{MP_L}{MP_K}$
- 2) Find the optimal input ratio $\Rightarrow MRTS = \frac{w}{c}$
- 3) Units were given, calculate input mix:
 - Find relationship between K and L by using $MRTS = \frac{w}{c} \Rightarrow K = aL$
 - Put $K = aL$ into quantity function, eg. $Q = 50K^{1.25}L^{0.5}$
 - 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 $\Rightarrow Q = 50K^{1.25}L^{0.5}$
- 7) Find substitution effect and scale effect.

- Substitution effect:

Same isoquant, different isoexpenditure (line)
(Curve)

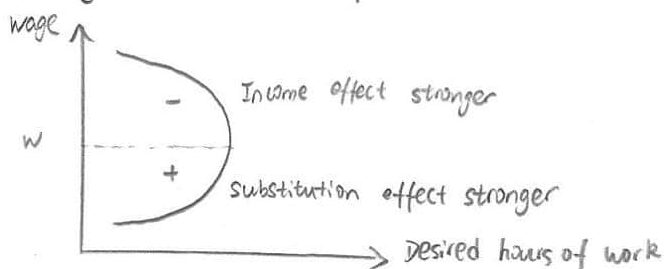
- Scale effect:

Same isoexpenditure, different isoquant

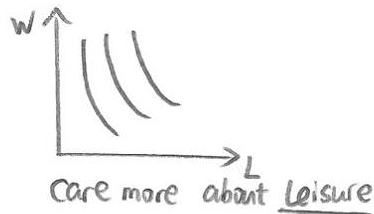
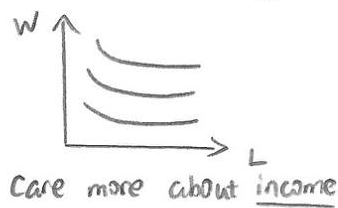


【Chapter 6】 Leisure & Work

① Utility: Labour satisfaction



② Individual utility curve:



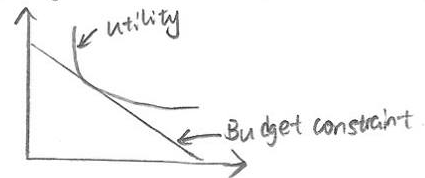
③ 4 principles:

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

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

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

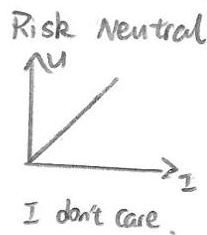
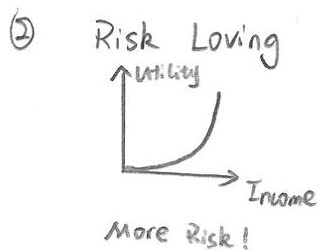
⑥ Budget Constraint



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

【Chapter 7】 Uncertainty & Risk

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



How to distinguish?

$$U = I^a \begin{cases} a > 1 & \swarrow \text{Loving} \\ a = 1 & \swarrow \text{neutral} \\ 0 < a < 1 & \swarrow \text{averse} \end{cases}$$

$U = \log I \quad \swarrow \text{averse}$

③ 3 ways to averse risk:

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

④ Risk of Portfolio:

• $R_p = R_f + b(R_m - R_f)$

$m \rightarrow$ Risky assets

• $b = \frac{\sigma_{\text{portfolio}}}{\sigma_{\text{risky}}}$

$f \rightarrow$ Risk free assets

• $R_p = R_f + \frac{(R_m - R_f)}{\sigma_m} \times \sigma_p$

$\sigma \rightarrow$ 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 $\Rightarrow E_r = 30\% \times 8 + 70\% \times 20 = 16.4$ (e.g.)

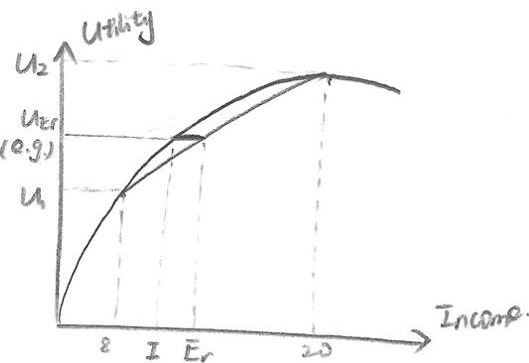
2) Find Expected Utility of Return

$\Rightarrow U_{Er} = 30\% \times U_1 + 70\% \times U_2$

3) Put 2) into Utility function $U = 20I^3$ (e.g.)

Let $U = U_{Er}$, find I

4) Risk premium = $E_r - I$



【 Chapter 8 】 Financial Market

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

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

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

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 $\xrightarrow{\text{issue}}$ (CAD) $\xrightarrow{\text{in}}$ Canada
(different) (same)

Eurobond : German $\xrightarrow{\text{issue}}$ (USD) $\xrightarrow{\text{in}}$ Canada
(different) (different)

【 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 unfavourable 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.

② 5 Types of Credit Market Instruments:

- 1) Simple Loan: payback "principal + 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:

$$\text{Real Interest} = \text{Nominal Interest} - \text{Expected Inflation}$$

【 Chapter 11 】 Demand / Supply of Assets / Bonds

① Demand Assets:

Wealth	+, +
Expected Return	+, +
Risk	+, -
Liquidity	+, +

② Supply Assets:

"Central Bank"

③ Liquidity:

<u>Government</u>	<u>Corporation</u>
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

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

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: $\left\{ \begin{array}{l} \text{Trade Flows} \\ \text{Capital Flows} \\ \text{People (Labour) Flows} \\ \text{Similarity/ Price Flows} \end{array} \right.$

② Trade to GDP:

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

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 = $\frac{①}{③}$	Rate B = $\frac{②}{④}$

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

② Who has Absolute Advantage \Rightarrow Compare ① & ② , ③ & ④

• The one who has bigger amount has absolute advantage.

③ Who has Comparative Advantage \Rightarrow 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

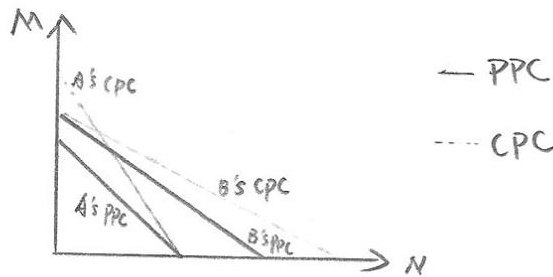
Draw the Gain & Loss Form:

	Company A	Company B
Gain	$\beta \times \text{Rate A}$	$\beta \times \text{Rate C}$
Loss	$\beta \times \text{Rate C}$	$\beta \times \text{Rate B}$
Difference	a	b

* The company who will produce the product will gain trading units \times 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

⑤ 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

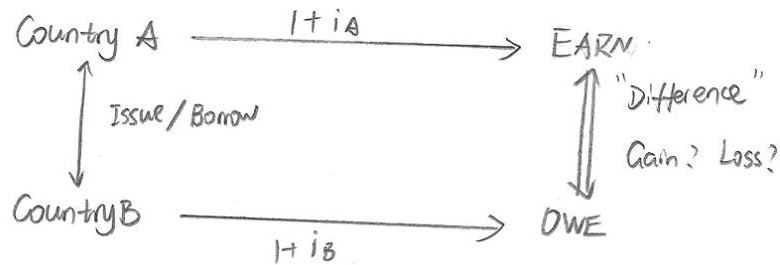
a) What is the expected value of the Euro in a year? \Rightarrow Forward rate

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

• 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?

- How do you Investment?



- ① Compare E_p
- ② Invest to future
 $A \xrightarrow{1+i_A} A'$
 $B \xrightarrow{1+i_B} B'$
- ③ Compare A' & B'
 • A, B, A', B' must in Same Currency.

Euro price forward = \$1.3168 > $E_p = \$1.3135$

i. Borrow in Canada & Invest in Europe (Germany)

① Borrow \$1 million in Canada, and owe \$1020900 in one year

② Use \$1 million to buy Euro and get:

$$\frac{1,000,000}{1.3230} = \text{€ } 755,857.8987$$

These money will increase to:

$$\text{€ } 755,857.8987 \times 1.0283 = \text{€ } 777,248.6772 \text{ in one year}$$

Then you trade the Euro back to CAD and you will get

$$\text{€ } 777,248.6772 \times 1.3168 = \$1,023,481.058$$

③ Your profit would be: $1,023,481.058 - 1,020,900 = \underline{\underline{\$2,581}}$

C) How would you arbitrage the market with \$1 million Canadian if the one-year forward price of the Euro is \$1.3112? How much arbitrage profit you would make?

Euro price forward = \$1.3112 < $E_p = \$1.3135$

i. Borrow in Europe (Germany) and invest in Canada.

① Borrow \$1 million of the Euro which equals to

$$\frac{1,000,000}{1.3230} = \text{€ } 755,857.8987$$

and owe $\text{€ } 755,857.8987 \times 1.0283 = \text{€ } 777,248.6772$ in one year

② Get $1,000,000 \times 1.0209 = \$1,020,900$ in one year

Principal in one year would be

$$\text{€ } 777,248.6772 \times 1.3112 = \$1,019,128.466$$

③ The profit you earn would be

$$\$1,020,900 - \$1,019,128.466 = \underline{\underline{\$1,771.534}}$$

Kevin Liu

email: l_yuanch@live.concordia.ca