2004 CFA Economics
Level 2

1:30-4:30 PM
March 7, 2004

Lecturer: Dr. Li

Economics for Valuation

- Macroeconomics
  - Growth & Accumulation
  - Growth & Policy
- Private & Public Choices (2004 新議題)
  - How Does Government Regulation Affect Your Life?
  - Nature Resources & the Future
  - Economics & Environment
- International Investments
  - Foreign Exchange Parity Relations
  - International Asset Pricing
- Analyzing the Firm's Environment

常考之重要議題包括：

- Wealth accumulation & social choice
- Growth accounting equation
- International currency markets
- Foreign exchange relationships
- Parity relationships: international parity, interest rate parity, PPP, arbitrage, covered interest arbitrage
- Forward premiums and discounts & their relationship to nominal interest differential between two countries
- Change in real exchange rate: expected exchange rate
- Fisher effect & international Fisher effect
- Stages in product's life cycle

I. Growth and Accumulation

1. Production Function

The general equation:
Y= AF (N, K)

其中 Y = output, A = the level of technology, N= labor, K = capital

一個具體的例子**:Cobb-Douglas production function**
$Y= AN^{(1-\theta)}K^{\theta}$, Where $0<\theta<1$ 是一項參數，反映出 N or K 哪一項較重要
對上式取 log，再微分得出
$\triangle Y/Y=\triangle A/A+(1-\theta)\triangle N/N+\theta\triangle K/K$

★產出的成長率決定於技術進步的成長率、勞動的成長率和資本量的成長率

再對 C-D production function 除 N，取 log 後，再微分得出 **Growth accounting equation:**

$\triangle(Y/N)/(Y/N)= \triangle Y/Y - \triangle N/N$
$= \triangle A/A+(1-\theta)\triangle N/N+\theta\triangle K/K - \triangle N/N$
$= \triangle A/A + \theta(\triangle K/K-\triangle N/N)$
$= \triangle A/A + \theta\triangle(K/N)/(K/N)$

其中 Y/N 是每人產出
★每人產出的成長率決定於技術進步的成長率和每人使用資本量的成長率

如果 K 不變, N 成長，或 K 雖成長但慢於 N 的成長，則產出的成長率會低於每人產出的成長率.

Question 1:
Sheila Strange is a senior economist for East Continental Investment, Inc. (ECI). ECI is an institutional money manager focused on domestic and international stocks. Sheila is considering investing in the Indian stock market. Sheila had determined that capital's share of income is 0.3. The annual labor rate has been 3.5%. The annual growth rate of the capital stock has been 2.0%. The growth rate in technology has been 1.5%. According to growth accounting, what has been the average annual growth rate of Indiana economy?

A. 5.35%
B. 4.55%
C. 6.25%
D. 3.65%

Answer: B
Since $\triangle Y/Y=\triangle A/A+(1-\theta)\triangle N/N+\theta\triangle K/K$ (see lecture note p.1), the labor share of income is 0.70 (1- 0.3).
$\triangle Y/Y=1.5\%+(0.70)(3.5\%) + (0.3)(2.0\%) = 4.55\%$

<u>Total Factor Productivity</u>: the increase in output due to improvement in productivity with no change in inputs. It is represented by the growth rate in A

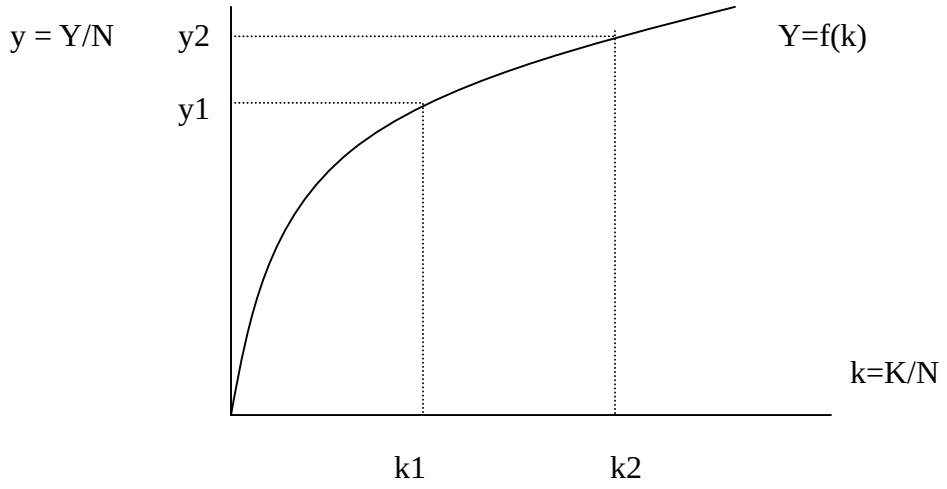
In the above C-D production function, if △A=0, the shares of output paid to capital and labor sum to 1, a 1 % increase in both inputs would increase output by 1%, The production has **constant return to scale**. If θ is less than 0.5, a 1% increase in the labor force alone has greater impact on output than does a 1% increase in the capital stock. The share of income going to labor is greater than the share going to owners of capital.

<u>Convergence</u> refers to the process of lower income countries increasing their standard of living and catching up with higher income countries. For example, acquiring technology from other countries or increasing investment in ***human capital.*** 例如兩岸所得會否趨同，何時趨同一直是熱門話題，上海每人平均所得已達 5,000 多美元，相當於 1980 年代後期台幣未大幅升值前的所得水準..再過 10 年，可能上海和台灣兩地所得接近.

☆How natural resources and human capital influence economic growth?
☆How to calculate △A/A?
技術進步(△A/A)等於產出成長率(或經濟成長率)扣掉勞動與資本的成長率.

如果台灣勞動力每年成長 1%，資本存量每年成長 2%，資本占產出比例爲 30%，請問技術要每年成長多少才可讓每人產出成長 2%?

2.Neoclassical growth theory



Assume no technological progress Fig.1

Y= F (N, K) then divide both sides by N,
y = f (k)
where y= Y/N and k = K/N

Output will increasing but a diminishing rate because of *diminishing marginal returns* to capital, see Fig.1

均　資本存量決定於
△k = sy-(n+d)k

其中 n = △N/N, labor growth rate
d= percentage capital stock depreciation rate, 0< d <1
s= percentage saving rate, and 0< s< 1
★表示投資等於儲蓄(儲蓄率 x 產出)減掉資本折舊和新增加勞動使用的資本

In steady-state equilibrium, △k = 0, implies sy=(n+d)k
If sy>(n+d)k, △k > 0, capital labor ratio k will rise
If sy<(n+d)k, △k < 0, capital labor ratio k will fall

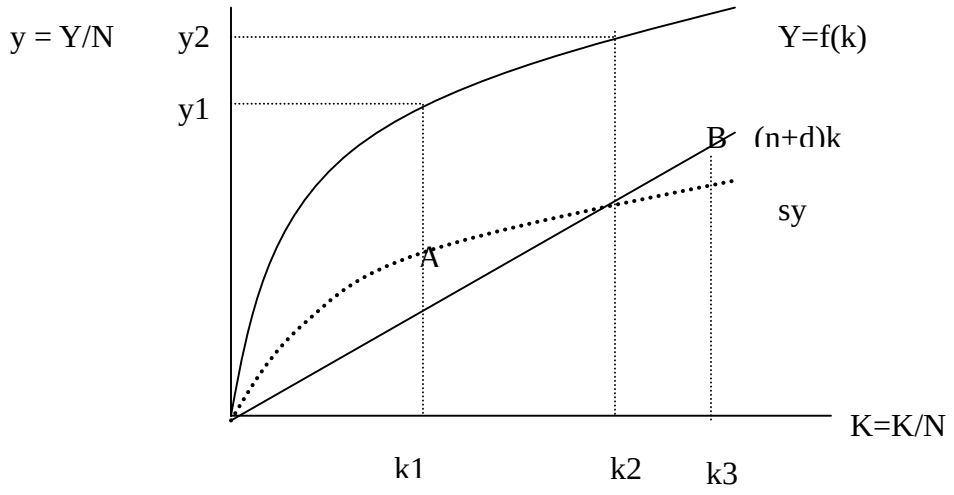


Fig.2

In Fig 2, k2 是均　的資本存量, 因爲在 k2 時, sy=(n+d)k.
如果 s 增加, △k 會增加**,** Y/N 也上升
如果 n 增加, △k 會減少**,** Y/N 也下降
★一國若要增加每人產出, 應鼓勵儲蓄或減少人口成長速度

II. Growth and Policy

雖然 Neoclassical growth theory 指出技術進步對產出成長有效果，但 could not explain why technological change occurred.

1.Endogenous growth theory

這理論認爲 Economic growth is a result of the evolution of an economy.
Explain growth as a self –sustaining process.
社會政策與選擇會影響技術進步和經濟成長，注重勞動品質而非數量

The differences between neoclassical and endogenous growth theory

	Neoclassical growth theory	**Endogenous growth theory**
Saving and output growth	Increases in savings have no effect on out put growth in long run. 短期是有效，但儲蓄增加會減少消費，最後導致投資減少，產出回到原來水準.. 例如日本	Increases in savings will increase output growth 儲蓄增加會轉化爲投資增加從而產出增加
Marginal product of capital	Diminishing returns to capital required for constant to scale.	The marginal product of capital is constant for society, diminishing privately. 由於專業化，技術擴散，對整個產業有利
Convergence of economies	Absolute or conditional Convergence predicted	No convergence implied, convergence with higher savings rates will grow more rapidly. See Fig3, 例如日本，四小龍

The implication for growth of the difference between private and social return
When an individual firm increases its capital, the private marginal return to capital were diminishing, yet the social return is constant. Because of 外部效果.

Consider the C-D production function,
$Y = AN^{\alpha}K^{\beta}$, Where $\alpha + \beta > 1$
Where α is the marginal product of labor

β is the marginal product of capital

$\alpha + \beta > 1$ implies that the production function has increasing returns to scale, larger firms have a cost advantage over small firms and the economy will be dominated by a few enormous firms.

Diminishing private returns to capital ensure that larger firms will not always have an advantage over smaller firms and so the economy will not be dominated by a few firms because individual firms do not experience increasing return to scale. For society, however, constant marginal return to capital mean that the production function for society does have increasing returns to scale.

Neoclassical growth theory predicts countries with different levels of output per capita will eventually reach the same standard of living(absolute convergence), if they have the same saving rates , population growth rate and access to the same technology.
For countries with different savings rates or population growth rates, the countries will eventually have equal growth rates but will not have the same steady state income levels. (conditional convergence)

According to endogenous growth theory, countries with higher saving rates will grow more rapidly, so convergence will not occur if one country saves more than another.

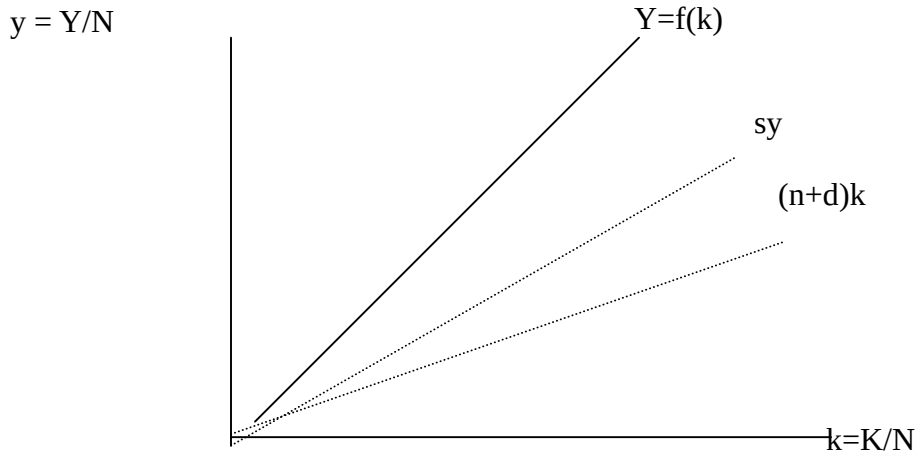


Fig.3

There is no steady-state equilibrium exist in Fig. 3 because sy is always greater than (n+d)k. 顯示經濟發展是強者越強.

Question 2:
According to the endogenous growth theory, what is the relationship between saving rate and the growth rate of output?

A. The lower the saving rate, the lower the growth rate of output.
B. The higher the saving rate, the lower the growth rate of output.
C. The growth rate of output is independent of the saving rate.
D. The lower the saving rate, the higher the growth rate of output.

Answer: A
According to the endogenous growth theory, increases (decreases) in savings will increase (decrease) output growth.

2.Population growth and economic growth

Neoclassical growth theory predicts that increased population growth will decrease standards of living as each worker has less capital with which to work.

But population is not simply an independent factor in an economy. Endogenous growth theory allowed technology progress to be dependent on economic development, population growth may depend on economic condition. More recently, countries with higher standards of living have lower birth rates. 兩者有相互影響的關係

Four Asian tigers—increase in inputs and invest in human capital.

3.Growth policy

從亞洲四小龍的經驗得出，發展中國家要有持續的經濟成長必須具備以下政策:

▲Macroeconomic stability
▲Liberalize prices
▲Privatization
▲Liberalize
▲Social service
▲Legal structure

II. Economics: Private and Public Choice

1.How does government regulation affect your life?

(1). The goals and techniques of economic regulation vs. the goals and techniques of health and safety regulation.
Economic regulation 通常透過管制價格或產業結構多於管制生產過程, health and safety regulation 通常要求生產者符合政府訂定的最高或最低標準.

(2). How economic incentives and political activities can influence regulatory decisions and performance of the regulatory process.
▲利益團體幹預，經濟效率無法達成
▲管制單位常採用被管制企業的看法
▲管制缺乏彈性，對企業的動態變化反應緩慢
▲研發成果要取得管制單位許可才可以出售，將使得新產品在市場上推出較爲困難.

(3). Analyze the potential effect of health and safety regulation on decision made by regulated firms
增加企業成本，效果如同課稅，使產品價格上升，長期會減少產量，但可提高品質與安全

(4)The unintended costs of regulation.
管制成本不易計算，常常會矯枉過正

2. Natural resources and the future

(1).Whether markets for natural resources tend to function like markets for other goods.
yes…同樣按 The law of supply and demand 決定 price and quantity
不同的是, natural resources 需求彈性和價格彈性都較小，與工業產品相比，許多自然資源屬於公共財，又缺乏再生能力，而且政府必須制定法律定義其財產權，不然會被濫用. 如空氣污染

(2).The influence of property rights on the availability and usage of natural resources
當財產權定義清楚, natural resources 有較高價值和使用效率，例如土地擁有者會出售給建商開發而不是用來種田.

(3).Dwindling supplies of natural resources are likely to cause economic dislocation and hardships?
過去經濟發展大多非常依賴自然資源的投入，如木材，煤炭，但現代則不一定，技術進步使企業用較少的 natural resources，不過不保証以後不會發生，例如地球上的石油將在 40 年後耗用完.

3.Economics and environment

(1).How economic analysis can contribute to decision about environmental policy
現代經濟學中的產權理論和外部性分析對 environmental policy 的制訂非常有幫助,

降低了環境被破壞的程度，同時使自然資源的使用更有效率.

(2) How economic growth affects environmental quality
較低所得時，經濟政策重視成長，犧牲 environmental quality，如可以忍受空氣污染，但到達一定所得水準，民眾要求環境品質.
但如果缺乏財產權和市場交易，一定的所得水準不一定使環境品質變好，如前蘇聯.

(3).How the establishment of property rights can influence environmental quality.
當環境的財產權建立後，民眾會保護其私有產權，如河水水質的保護. 又如自己的花園，總是比公共公園乾淨.

(4) The limitation of government regulation in dealing with environmental problem.
只要財產權界定清楚，市場會有效率地解決環境問題. 但有些環境污染太廣泛，必須由政府管制，但問題是政府很少根據價格訊號去管制，往往又因缺乏訊息而無法解決問題.

III. The Foreign Exchange Market

1.Exchange market

外匯市場可分成現貨市場(The spot currency exchange market)與期貨市場(The forward currency exchange market)

Bid/asked quotations on currency exchange rates
Bid quotation
dealer’s 買入價 = public trader 賣出價

Asked quotation
dealer’s 賣出價 = public trader 買入價

The dealer’s (Bid/asked) spread
A dealer’s asked quotation > His Bid quotation
The difference is the dealer’s spread (profit)
The public must buy from the dealer at the high (asked) price and sell to the dealer at the low (bid) price.

Example:
￥ / ￡: 185 - 190
This means that the dealer is willing to buy pounds from the investor for ￥ 185 per pound, or the dealer is willing to sell pounds to the investor for ￥190 per pounds

Percent Spread = 100* (ask price –bid price) /ask price

2.Currency cross (exchange) rates

Without bid/asked dealer spread

If ￥ /$= 110
and
￡/$ = 1.05
the cross exchange rates between the yen and the pounds is
(￥110/ $)(￡1.05/$) = ￥104.7619 / ￡ (the price of pounds in terms of yen)

With bid/asked dealer spread
If ￥ /$ = 110 - 112
(dealer 買入價) (dealer 賣出價)
and
￡/$ = 1.05 - 1.06
(dealer 買入價) (dealer 賣出價)

then ￥/ ￡= 103.7736 – 106.6667
(110/1.06) (112/1.05)

Arbitrage in the currency markets
如何在外匯市場套利?
Example
In New York $1.00 = ￡0.5882
In London ￡1.00 = Euro 1.82
In Frankfurt: $1.00 = Euro 1.0638

假設你有 1,000,000 美元
先在 New York 換成 pound: 1000000 x ￡0.5882/$ = ￡588200
然後在 London 換成 Euro: ￡588200 x Euro1.8200/￡ = Euro 1070524
然後再在 Frankfurt 換回 dollars: Euro 1070524/ Euro1.0638 = $1006321
與原來比較, 賺了 $6321

Question 3:
Assume that a British investor has 10 million pounds (£) to invest. This investor could buy Euros at a rate of £0.625 per Euro, or Canadian dollars at a rate of 0.46 £/$can. Assume also that the investor could buy Euros at a rate of $Can1.41 per euro. This

investor could earn a riskless profit by (assume no transaction costs):

A. buying $Can, using $Can to acquire Euros, and then selling Euros for pounds
B. buying Euros, using Euros to buy $Can, and then selling $Can for pounds
C. buying equal amounts of $Can and Euros
D. cannot be determined from information given

Answer: B
1£ 換算 Euros = 1/0625 =1.6 Euros, 1.6 Euros = 1.6*1.41=2.256 $can, 2.256$can =2.256*0.46=1.03776 £ > 1£. 用答案 A 來算會 < 1£

3.Valuing currency forward and futures contracts

The interest rate parity theory (利率平價理論)

According to the relationship between the forward exchange rate and the spot exchange rate between two countries should be as follows:

$$\mathbf{F_{TW/US} = S_{TW/US} [(1+ r_{TWp}) / (1+ r_{USp})]}$$

★表示考慮到兩國利率水準的差異後,兩國外匯之預期報酬率相等.

Where

$F_{TW/X}$ is the forward contract price of currency US quoted in term of currency TW.
$S_{TW/X}$ is the spot exchange rate of currency US when quoted in term of currency TW.
r_{TWp} is the periodic risk-free in Country TW [$r_{Yp} = r_{TW}\ t_M / 360$]
r_{USp} is the periodic risk-free in Country US [$r_{Xp} = r_{US}\ t_M / 360$]
t_M is the number of days until the forward contract expires

爲何兩國外匯之預期報酬率會相等? 上式是一種均衡狀態(即不再變動), 用直覺判斷, 如果台灣的利率較美國高, 則熱錢會不斷從美國流入台灣, 最後導致台灣貨幣供給增加而美國貨幣供給減少, 台灣的利率會下跌而美國的利率上升, 所以如果台灣的利率一直可以維持著較美國高, 則必然是預期台幣貶值而美元升值, 使得擁有台幣或美元的預期報酬相同, 因而國際資金不流入台灣

一個實際的例子是, 在亞洲金融風暴期間, 東南亞各國爲防止匯率不斷貶值, 紛紛提高利率來使得其國內資金對當地貨幣和美元的預期報酬率相等, 避免資金外移導致貨幣繼續貶值.

Example

The spot exchange rate between the British pound and the US dollars is $1.65/£. The risk-free rate in the US is 4%, while it is 6% in the UK. What should be the value of the 6-month forward pound?

$F_{\$/£} = S_{\$/£}\ [(1+ r_{U.S.p}) / (1+ r_{U.K.p})]$ = $1.65/£ [(1+0.04/2) / (1+0.06/2)] = $1.6340/£

Question 4:
Assume that one year interest rates in the US are 5%, while one year interest rates in Germany are 3%. If the spot rate of German marks to US dollars is 2.20/$, what must the one year forward rate be according to the interest rate parity?

A. 2.20
B. 2.095
C. 2.158
D. 2.245

Answer:C
According to the interest rate parity,
$F_{G/US} = S_{G/US} [(1+ r_{Gp}) / (1+ r_{USp})] = 2.20/\$ [(1+ 3\%) / (1+ 5\%)] = 2.518 /\$$

4.Covered interest arbitrage

Identify which currencies are over or undervalued in the forward market
Hedge the forward currency positions
Finance the hedge
Calculate the position from the arbitrage

Covered interest arbitrage profit =
(price of the overvalued futures contract - fair value of the futures contract)* contract size
or
(fair value of the futures contract - price of the undervalued futures contract)* contract size

Example:
不考慮利率的例子
The fair market value of the 6 month forward pound was $1.6340/£
The British pound were actually trading at $1.6450/£
The size of one British pound futures contract is £62500

	6-month forward pound	
Market value	Fair market value (interest rate parity)	Forward pound over/undervalued?
$1.6450/£	$1.6340/£	overvalued

a.Sell the overvalued forward pound
b.Hedge the forward position by BUYING the British pound in the spot market with US dollars

c.To finance the hedge, borrow US dollars from a US bank to buy a sufficient amount of British pounds in the spot market to be able to cover the forward contract when it matures.
d.Cover these US dollars into British pounds , and invest the pounds in a UK bank until the delivery date on the forward contract.
e.Calculate the arbitrage profit

$1.6450/￡-$1.6340/￡ x ￡62500 = $375

5.Interest rate parity theory

Interest rate parity theory means that, in equilibrium, currency US's annualized forward premium (ie., the annualized percentage difference between its forward and spot exchange rates vis-à-vis currency TW) should be approximately equal to the difference between interest rates in country TW and country US.

Forward premium(遠期溢酬) = $(F_{TW/US} - S_{TW/US})(360/t_M) / S_{TW/US} \approx r_{TW} - r_{US}$
(annualized forward premium)

If the annualized forward premium calculated using this equation is a negative number, it could be called an **annualized forward discount (遠期貼水).**

★上式表示期貨與現貨外匯之差價約等於兩國利率水準的差異.

Example:
In Zurich, the spot and 30-day forward exchange rates for the yen against the pounds are trading as follows:

Spot Market	30-day forward market
￥1.00=￡0.01000	￥1.00=￡0.01002

Forward premium = $(F_{B/J} - S_{B/J})(360/t_M) / S_{B/J}$
= (0.01002-0.01000)(360/30)/0.01000 =2.4%

If the spread between interest rates in country TW and country US exceeds (is less than) the annualized forward premium of country US's forward currency exchange rate vis-à-vis currency, arbitrageurs will buy (sell) the undervalued (overvalued)currency US forward contracts and sell (buy) the overvalued (undervalued) currency US in the spot market.

To finance this arbitrage, they will borrow Currency US (TW) in country US (TW), exchange it for currency TW(US), and invest the funds in country TW (US). As a result, spot funds will flow from country US (TW) to country TW(US), lowering interest rates

in country TW (US)and raising them in country US (TW).

Question 5:
The nine-month forward exchange rate between the U.S. dollar and the euro is $0.96/€. The spot exchange rate is $0.94/€. What is the forward premium?

A. 2.083%
B. 2.027%
C. 1.596%
D. 2.837%

Answer: D
Forward premium = $(F_{US/E} - S_{US/E})(360/t_M) / S_{US/E}$ = (0.96-0.94)(360/270)/0.94 = 2.837%.

Question 6:
If the forward exchange rate is $1.05/€ and the fair forward exchange rate based on interest rate parity is $1.09/€. Which of the following actions would be part of an interest rate arbitrage to profit from the misevaluation?

A. Sell the $ forward and borrow $ today
B. Buy the $ forward and borrow $ today
C. Sell the $ forward and borrow € today
D. Buy the $ forward and borrow € today

Answer: C
從題目可判斷出歐元期貨在外匯市場根據 Interest rate parity 是被低估(要買進)，同時歐元現貨市場相對是被高估(要賣出)，因此套利者需借歐元然後利用現貨市場匯率換成美元，並等到期貨到期時將手中美元平倉，然候拿歐元去結算之前的歐元借款，進而小賺一筆歐元。

6.Purchasing Power Parity (PPP, 購買力平價理論)

用兩國價格水準　量其現貨匯率, 一國的物價上漲, 其貨幣的實質購買力會下降, 與以往相比較不值錢, 因此其貨幣會貶值.

例如大陸從 1979 年改革開始至 1994 年, 通貨膨脹相當嚴重, 物價上漲率逐年上升, 人民幣兌美元匯率也從 1979 年的 1:1.5 貶至 1994 年的 1:8.7, 從 1994 年起物價上漲率逐年下降, 甚至從 1997 年起出現輕微的通貨緊縮, 人民幣兌美元匯率也升值到 1:8.278 元.

Absolute Purchasing Power Parity (絕對購買力平價理論))
只比較某一時點兩國的價格水準而算出其合理匯率水準，例如著名的大漢堡計演算法，如果一個麥當勞的大漢堡在美國賣 2 美元，而在台灣要 70 台幣，則台幣兌美元匯率應爲 1 : 35

★Spot exchange rate = price level in home country/ price level in foreign country
$S_{TW/US} = P_{TW} / P_{US}$

Relative Purchasing Power Parity (相對購買力平價理論)
就某一段時期兩國的物價上漲率比較而算出其未來的匯率，例如，假設台灣的通貨膨脹率比美國高，則台幣的實質購買力會下降，將會貶值.

計算公式如下

$\mathbf{S_t = S_0 * (1+i_{TW})^t/(1+i_{US})^t}$
Where i is inflation rate
or $\mathbf{(S_t - S_0)/ S_0 = \%\triangle S \approx i_{TW} - i_{US}}$
★即台幣匯率變動的幅度約等於台灣與美國通貨膨脹率的差異

Question 7.

	Index Basket Price	Inflation Rates
Canada	1337.52	5.0%
UK	515.01	2.0%

Current Exchange Rate:2.21 C/￥

Given the above information, estimate the exchange rate of the C/￥ in one year, using relative purchasing power parity

A. 2.15 C/￥
B. 2.21 C/￥
C. 2.28 C/￥
D. 2.60 C/￥

Answer:C
Relative Purchasing Power Parity:
$S_t = S_0 \times (1+i_{Canada})^t/(1+i_{UK})^t = 2.21 \times [(1+5\%)/(1+2\%)]^1 = 2.28$ C/￥
Where i is inflation rate

7.The Fisher Effect

The Fisher effect 嚴格的定義是:

(1+名目利率) = (1+實質利率)* (1+預期通貨膨脹率)
or
(1+nominal interest rates) ≈ real interest rates + expected inflation rate
or
$(1+r_N) = (1+r_R)(1 + E(\text{inflation rate}))$
where E (inflation rate) is expected rate of inflation

通常把 Fisher Effect 解釋爲
★名目利率 **(nominal interest rate)**約等於實質利率加上預期通貨膨脹率

nominal interest rates ≈ real interest rates + expected inflation rate

如果不考慮預期因素,
則 **nominal interest rates ≈ real interest rates + inflation rate**

8.The International Fisher Effect

Fisher effect 另外的意涵是, 如果在不同國家間的實質利率因國際資本套利而相等,
★兩國名目利率的差異應該*約等於*兩國預期通貨膨脹率的差異

The Fisher effect also implies that, if real interest rates among nations are equalized by arbitrage, then the difference between two nations nominal interest rates should be approximately equal to the difference in their expected rates of inflation.

例如,
台灣的名目利率 – 美國的名目利率 ≈ 台灣的預期通貨膨脹率 - 美國的預期通貨膨脹率

如果不考慮預期因素, 則
台灣的名目利率 – 美國的名目利率 ≈ 台灣的通貨膨脹率 - 美國的通貨膨脹率

由前面所述相對購買力平價理論我們知道台幣匯率變動的幅度約等於台灣與美國通貨膨脹率的差異
$(S_t - S_0)/S_0 = \%\triangle S \approx i_h - i_f$
因此可能出以下結論,
★台幣匯率變動的幅度約等於台灣與美國名目利率的差異
$\%\triangle S = r_{N\,TW} - r_{N\,US}$

IV. International Asset Pricing

1. International market integration and international market segmentation

如果國內資本市場有效率, 資產價格任何時候都會反映其基本價值, 投資人無法打敗市場, 即使國內資本市場有效率, 如果國與國間有障礙, 國際資本市場仍不是有效率的.

如果國際資本市場能夠整合, 資本隨時因新訊息而在國際間流動, 預期報酬會相同. 如果國際資本市場是分割的, 國際資本無法消除國與國之間的套利機會.

The impediments to international capital mobility
事實上, 國際資本無法在國與國之間完全自由流動, 原因包括:
◆Foreign currency risks
◆Psychological barriers
◆Transactions costs
◆Legal restrictions
◆Discriminatory taxation
◆Political risks

International market integration
Profit motive, 主要動機在國際投資人能獲利

2.The domestic capital asset pricing model (CAPM)

Business –specific risk can be diversified away, therefore the relevant risk of a security (in a portfolio context) is the risk relative to the market as measured by beta (not its total risk

$E(R_i)=R_0 + \beta_i(RP_w)$
where $E(R_i)$ is the expected return on asset i
R_0 is the risk-free interest rate
β_i is the sensitivity of assets i to movements in the market
RP_w is the market risk premium (the expected return on all domestic assets- the risk free rate)

The CAPM assumption
Investors care about nominal returns in their own currency
Investors are risk-averse and care about risk and return
Investors agree about the expected return and risk of all assets
There are no transaction costs or taxes
There is a risk-free interest rate at which investors may borrow or lend

Real exchange rates
名目現貨匯率經過兩國價格水準調整後的匯率
例如**台幣的 Real exchange rates (REF)=台幣名目現貨匯率 x(美國物價水準/台灣物價水準)**

3.International CAPM

★The foreign currency risk premium, SRP, is the expected change in the exchange rate minus the interest rate differential.

當投資外幣，在計算預期報酬時，除了評估未來匯價變化以外，也要考慮外幣利率的高低，以免賺了匯價，賠了利息.

Example:
從 1997 年台幣走貶後，許多人把台幣換美元(當時 1:28)，如果美元利率(2%)比台幣利率(5%)低，則換回台幣結算利潤時(1:35)要考慮到台幣利率較高的機會成本損失.
在這個例子中, foreign currency risk premium 是 [(35-28)/28] – (5%-2%)= 22%

用公式表示則是
$SRP = [E (S_1-S_0)/ S_0] -(r_{TW} - r_{US})$
where S_1 is the future spot exchange rate in period 1
從利率平價理論得出 $(F-S_0)/ S_0 \approx r_{TW}- r_{US}$

因此 $\mathbf{SRP = [E (S_1)-F] / S_0}$

★It means that he foreign currency risk premium represents an additional payment above the interest rate differential to foreign investors in term of a higher forward rate or a higher expected rate of depreciation.

Example
The one year risk-free interest rate for country TW is 10%, while the one year risk-free rate for country US is 6%. The spot exchange rate between the two countries is 2.00/1.00. The expected exchange rate appreciation of country B’s currency is 6%. What is the foreign currency risk premium.

Answer:
SRP = [E (S_1-S_0)/ S_0] -(r_{TW} –r_{US})
={ [(2.00 x 1.06)-2.00]/2.00]} – (10%-6%)
=2.00%

Question 8:
Barry White is the chief investment officer of UK-based Diversity International Advisors, Inc.(DIA). A Japanese client has contacted Barry regarding investing in Sterling denominated bonds. Based on the forecast by DIA's economist, the one year risk-free interest rates are 4% in the UK and 1% in Japan. The current spot exchange rate between the two countries is 200Yen/Pound. The price level of the typical consumption basket in the UK to the price level of the typical consumption basket in Japan is 180 to 1. The expected exchange rate at the end of the year one is 208 yen/pound.
For the Japanese investor, what is the foreign currency risk premium?

A. 7%
B. 5%
C. –5%
D. –7%

Answer:A
The foreign currency risk premium, SRP, is the expected change in the exchange rate minus the interest rate differential.
SRP = [E (S_1-S_0)/ S_0] -(r_J –r_B)
= [208-200/ 200] -(1%-4%) = 7%

The International CAPM (ICPAM)

$E(R_i)=R_0 + \beta_{iw}(RP_w)+ \gamma_{i1}(SRP_1)+ \gamma_{i2}(SRP_2)+\ldots\ldots + \gamma_{ik}(SRP_k)$

Where R_0 is the domestic currency risk-free rate, β_{iw}(is the sensitivity of the domestic currency returns of assets I to world market movement, RP_w is the world market risk premium(=E(R_w-R_0)), γ_{ik}(represent the sensitivity of the domestic currency return of asset i to currencies 1 through k and SRP_1 through SRP_k are the foreign currency risk premium for the k currencies.

It shows that the domestic currency return on the foreign investment depends on
▲The domestic risk-free rate
▲The world market premium
▲The foreign currency risk premia and the sensitivity of the asset's domestic currency return to changes in foreign risk premia

Example
An investor in country G(domestic country) is trying to decide whether to invest in country H's (foreign country) stock market. The risk-free rate for country G is 3% and for country H is 2%. The estimated world market risk premium is 4% and the world beta for the company that the investor is interested in is 1.1. The foreign currency risk premium is 1% and the currency exposure for the stock us 2%. Using ICAPM, what is the expected return for the stock?

Answer
$E(R_i)=R_0 + \beta_{iw}(RP_w)+ \gamma_{i1}(SRP_1)+ \gamma_{i2}(SRP_2)+\ldots\ldots + \gamma_{ik}(SRP_k)$

The model is simplified to the following
$E(R_i)=R_0 + \beta_{iw}(RP_w)+ \gamma_{i1}(SRP_1)$
$= 3\% + (1.1)(4\%) + (2)(1\%)$
$=9.4\%$

Currency exposure and correlation
The currency exposure of a foreign investment is related to its sensitivity to movements in exchange rates. As such it is like a domestic asset's beta. It can be defined as the sensitivity of asset returns to changes in the foreign exchange rate, measured in the investor's home currency.

To see how this relates to correlation, remember that the beta of security I was given by

$\beta_i= Cov(R_i, R_m)/ Var(R_m)$

where R_m is the market return portfolio return
Now the correlation between the return on assets I in the market portfolio return is
$Corr(R_i, R_m)= [Cov(R_i, R_m)/\sqrt{Var(R_i)}* Var(R_m)]$

So $Corr(R_i, R_m)= b_i/(\sqrt{Var(R_i)}*/ \sqrt{Var(R_m)})$

Therefor , the correlation between an asset's domestic currency return and the foreign currency risk premium is related in the same way to the γ_{ik}

$Corr(R_i, SRP_k)= \gamma_{ik}\sqrt{Var(SRP_k)} / \sqrt{Var(R_i)}$

The higher the correlation between the domestic currency returns on asset i and the foreign currency risk premium, the more sensitive that asset is to change in the foreign currency risk premium.

A zero correlation between an asset's returns and changes in the exchange rate means that, in the face of currency depreciation or appreciation, the asset will have no systematic price reaction to the exchange rate fluctuation.

A stock with **positive correlation** would benefit from a depreciating local currency. Its local price would be expected to rise, partially offsetting the currency beta.

The price of a **negative correlation** asset would drop in reaction to currency depreciation. It would compound the effect of the currency depreciation by sustaining an additional price loss.

Question 9.
Sam Black is a US –based portfolio manager considering investing in the Swiss and Germany stock markets. The world market risk premium is 8%. The currency risk premium on the Swiss Franc is 4%, and the currency risk premium on the Euro is 3%. The risk-free rate is 2% in US, 2.5% in Germany and 3% in Switzerland. Sam has developed the following analysis for four stocks.

Stock	A	B	C	D
Country	Switzerland	Switzerland	France	France
β_w	1	0.25	0.75	1.2
$\gamma_{S€}$	-0.5	-1.0	0.9	0.8
γ_{SF}	0.75	-0.25	-0.40	0.15

where β_w is the sensitivity of stocks to movements in the world market
$\gamma_{S€}$ and γ_{SF} represent the sensitivity of the USD return of stocks to Euro and Franc.
Calculate the USD return of A by using the CAPM.

A. 15.5%
B. 11.5%
C. 10%
D. 9%

Answer:B
The expected return for each stock is calculated using the following formula:
$E(R_i)=R_0 + \beta_{iw}(RP_w)+ \gamma_{iSF}(SRP_{SF})+ \gamma_{iS€}(SRP_€)$
$E(R_A)=0.02+1\ (0.08) + 0.75\ (0.04) – 0.5(0.03)= 11.5\%$

4.Relating Real exchange rate changes to domestic economic activities

(1).traditional model
貶值, in short run, 通漲(進口 prices increase), GDP decrease. In long run, exports increase, GDP increases. (J curve)

(2).money demand model
since MV = PY, if M is constant and Y increases, stock returns increase, P will fall, 升值, Since the stock market tends to rise when the real economy is rising, an expanding

economy and a rising stock market, tend to be associated with an appreciating currency.

V. Analyzing the Firm's Environment

1.Estimation, Projections and Interpretation

解讀產業銷售額如何受經濟變數例如 GDP 的影響
在以下迴歸式中,

Annual car sales = 6.76 million cars + 0.375 (GDP growth rate)
(0.77) (0.071)

If GDP growth rate is 3%, then Annual car sales = 7.89 million cars

constant term (6.76)
coefficient term (0.375)

Question: 10
In analyzing HGF Company, Jones prepared a regression analysis. He regressed the SG&A Expense against the Sales and found the following result:

Total SG&A Cost = $1,000,456 + 2455 (Sales)

In the equation, the $1000456 represents:

A. The variable portion of the SG&A cost.
B. The fixed portion of the SG&A cost.
C. The variable and fixed portion of the SG&A cost
D. The estimate of the next year SG&A cost.

Answer:B
The $1000456 is the Y-intercept of the equation, which is the fixed cost (the cost that would be incurred if sales were zero).

2.Real and nominal

企業的銷售額成長可能是由於通貨膨脹造成的, 因此需要調整(Adjusting for inflation), 以瞭解企業的真正績效

$\text{Sales}_{\text{current dollar}} = \text{Nominal GDP}_{\text{orginal year's dollar}} * (\text{current CPI/ original year's CPI})$

3.Industry and company performance

Short run effects of macro conditions on industries
Projecting long run industry sales
景氣好(不好)，消費者偏愛高(低)品質產品，高(低)價品好賣，如台灣近年國民便當大賣，量販店人潮洶湧

4.Product life cycle

任何產品都有 4 個階段的生命週期，雖然週期長短不一，例如 CRT 電視, VCD 放映機.
Stage 1. Development
Stage 2. Expansion
Stage 3. Maturity
Stage 4. Decline

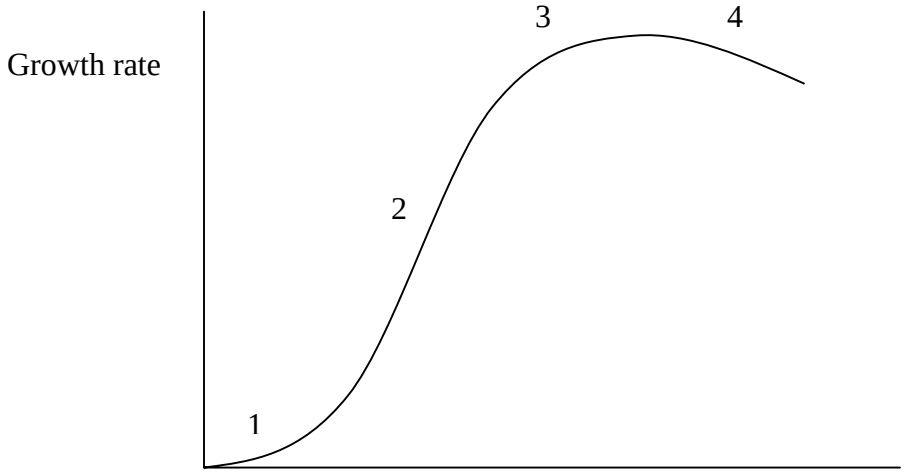


Fig. 4

但大部分產品非單一產品，而是由多方面特性組成，會因時間而改良，得以繼續生存，如鏢局，客棧，現在叫保全，飯店.

"Regression toward the mean" refers to the fact that in the long run sales and profit margins tend to revert to their more normal levels in line with the industry's fundamentals.
★長期而言，企業的銷售與利潤率因競爭者的加入而趨向產業的平均正常水準.

5.Market share, industry sales and company sales

Identify and discuss factors that may contribute to changes in a company's market share of an industry's sales

(1+projected firm's sales)=(1+ projected industry sales growth) *(1+fraction. △of

market share)
★即企業的銷售變化可拆分爲產業的銷售變化和企業本身市占率變化兩部分

Estimate how a company's market share is affected by changes in the company's marketing efforts and by changes in competition.

change in market share (rate of change)

=(change in firm's sales- change in industry sales)/(1+change in industry sales)

and

(1+growth in firm sales) = (1+ growth of industry sales)*(1+ firm's % change in market share)

Example
An analysis of the Tired and Rubber industry indicates that industry sales will grow by 5% next year. It is further estimate that XYZ Company's market share will increase from 20% of the market to 22% of the market due to its marketing strategy. Calculate the company's growth rate for next year.

Answer:
(1+growth in firm sales) = (1+ growth of industry sales)*(1+ firm's % change in market share)
= (1+0.05)x{1+[(0.22-0.20)/0.20]} = 1.05 x 1.1 = 1.155

Firm's growth rate = 1.155 –1 = 15.5%