

# 五校聯盟微課程

## 個體經濟學原理

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## Outline

1. Thinking Like an Economist
2. The Scope of Economics
  - Positive vs. normative analysis, micro vs. macroeconomics
3. Optimization
  - Opportunity cost, production possibility frontier
4. Equilibrium
  - Comparative advantage, gain from trade
5. Empiricism
  - Correlation vs. causation



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## Thinking Like an Economist

- Economists play two roles:
  - Scientists: try to explain the world.
  - Policy advisors: try to improve the world.
- Economists employ the **scientific method**.
  - Analyze and test theories about how the world works.
  - Devise theories, collect data, and analyze these data to verify or refute the theories.

經濟學家試圖建立理論來解釋社會現象，進而提出解決方法(政策建議)。經濟學家會藉由蒐集資料、分析資料、以統計方法來檢驗理論正確與否。

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## Thinking Like an Economist

- Economists make **assumptions**.
  - Simplify the complex world and make it easier to understand. (Every one is **rational**. Or is it?)
  - Focus on the essence of the problem.
- Economists use **models** to study economic issues.
  - Simplify the reality to improve our understanding of it.
  - Allow us to see what's truly important.

經濟學家利用簡化的模型來研究經濟議題。良好的經濟模型建立合理、貼近現實的假設之上。經濟模型幫助我們**理解社會現象、解決社會問題**

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Q：你覺得以不同申請管道進入「台大」的學生，哪類學生的大學課業成績最好？

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李維倫、古慧雯、駱明慶、林明仁：「入學管道與學習表現」(2020，經濟論叢)

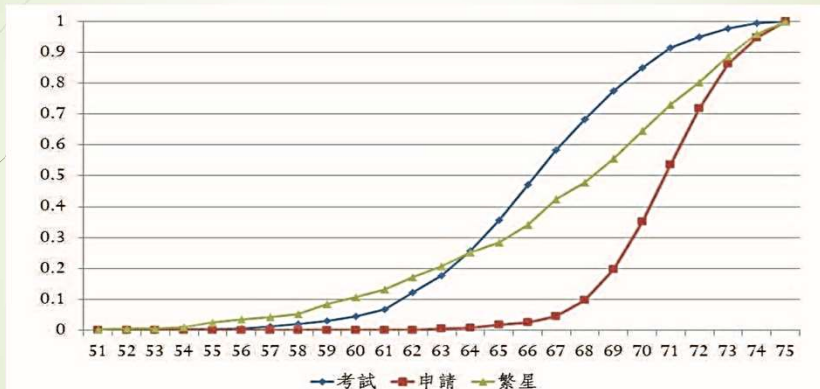


圖 1: 2015 年台大主要管道入學生學測總級分的累積分配

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## 李維倫、古慧雯、駱明慶、林明仁：「入學管道與學習表現」(2020, 經濟論叢)

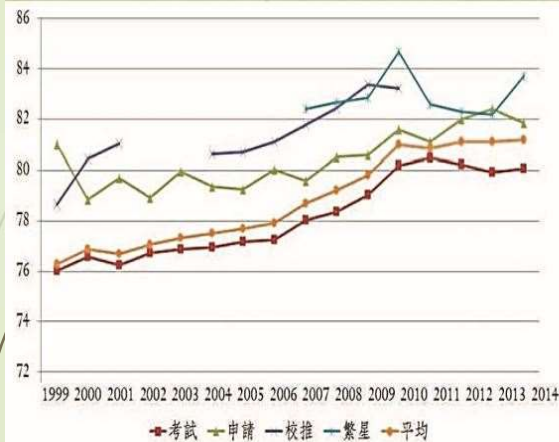


圖 2: 各主要管道入學生第一年平均成績

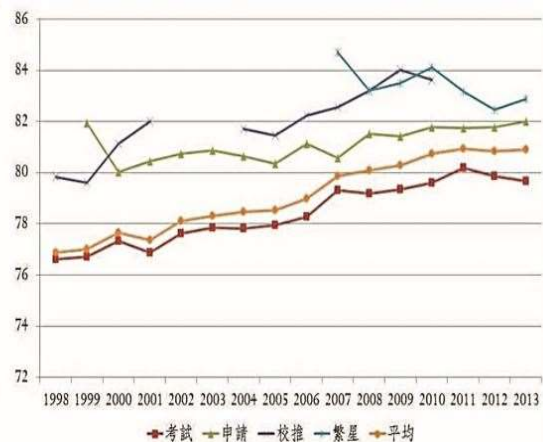


圖 3: 各主要管道入學生第二年平均成績

## Thinking Like an Economist

- 觀察現象：
  - 台大入學學測成績：申請生 > 繁星生 > 指考生
  - 大學學業成績：繁星生 > 申請生 > 指考生
- 重要問題：
  - 大學學業成績繁星、申請生 > 指考生，是因為他們本來就比較厲害？還是二階面試的功勞？高中成績與學測成績何者更具參考性？
  - 如果控制了學測成績，申請生的學業表現還會能勝過指考生嗎？
- 分析工具：
  - 資料數據、計量分析、理論模型

## Thinking Like an Economist

- 實證結果發現：
  - 控制學測成績之後，申請生與指考生學業成績已無差距；繁星生仍顯著高於指考生
  - 申請、繁星生的轉系和退學的比例，皆明顯低於指考生(指考生與科系的適配程度不如申請生與繁星生)
- 經濟解釋：
  - 長期(高中三年)的表現比短期(學測)的表現更能預測未來學業成就
  - 繁星生有較良好與穩定的學習習慣
  - 個人申請面試階段篩選僅在淘汰明顯不適合者，對「錄取者」的篩選效果有限(學測成績已經決定了大部分的結果)，但對適配程度有幫助
- 政策涵義：
  - 繁星與申請名額增加(已是趨勢)
  - 合併成為單一考試(分科測驗已不考國英數三科)

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## The Scope of Economics

### Positive analysis vs. normative analysis

Economists try to **explain** the world as well as to improve it by **giving advice**.

- Positive analysis: 實是性分析  
Economists describes what people **actually** do.  
e.g., “**Why do prostitutes earn more?**” or 「死刑真的有嚇阻力嗎？」  
實是性方法在**解釋、分析**經濟現象(為客觀分析)
- Normative analysis: 規範性分析  
Economists recommend what people **ought to** do (policy implications).  
e.g., “Should prostitution be legalized?” or 「死刑是否應該被廢除？」  
規範性方法在建議決策者**應該**如何做決策較好(帶有主觀評價)

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## The Scope of Economics

### Microeconomics vs. macroeconomics

- Microeconomics: 個體經濟學

The study of how individuals, firms, or government make choices, and how those choices affect prices, the allocation of resources, and the well-being of agents.

個體經濟學研究個體(包括消費者、生產者、或政府)的決策及其對價格、配置及福利的影響

- Macroeconomics: 總體經濟學

The study of the economy as a whole, such as the growth rate of a country's total output, the inflation rate, or the unemployment rate.

總體經濟學研究整個經濟體系的重要經濟變數，包括經濟成長、物價膨脹、失業率等

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Q: 「在控制學測成績之後，繁星生大學學業成績仍顯著高於指考生」，此陳述是屬於何種分析方式？

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## The Basic Principles of Economics

- Optimization : Economics studies the problem of “choice” only when resources are scarce. (最適)
- Equilibrium : Economics studies how people interact with one another. (均衡)
- Empiricism : Any theory with should be evidence-based. (實證基礎)

經濟學是用來研究在**有限資源**之下，經濟個體如何做**選擇**；乃至於個體之間如何**互動**，以及影響整體經濟體系**均衡**的因素與其效果。而所有的理論必須有實證的根據

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## Optimization

- Economic agents try to choose the **best feasible (available and affordable)** option, given the resources and information available at the time of the choice.
  - Trade-offs: Some benefits must be given up in order to gain others.  
經濟個體永遠在不同的選擇之間權衡**取捨** (e.g., 為甚麼要選台大經濟?)
  - Budget constraint: The set of things that a person can choose to do (or to buy) within the resources that he has (i.e., the budget).  
預算限制是經濟個體在**可購買財貨集合**上的限制 (e.g., 每周零用錢額度)

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## Opportunity costs

- Opportunity costs: 機會成本

The opportunity cost of something is the value of its **best alternative** activity.

選擇X的機會成本是，如果不做這個選擇的話，**其他選擇當中價值最高的**就是選擇X的機會成本。



**FB is free, or is it?**

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## Is FB free?

- When we are using FB, we **could have** spent the time in some other way: e.g., playing basketball, jogging, or working at a part-time job, and so on. The largest benefit among those things is the opportunity cost of using FB.
- The “best alternatives” are various across people; one way to evaluate the opportunity cost is using the minimum wage.
- In 2013, Web users worldwide spent 250 million hours on FB each day, or 15 minutes per day per person.
- 台灣有超過**一千萬**人使用臉書。平均每人每個月花費379分鐘在FB，或每天12分鐘 (by 市調公司創市際ARO)。
- 台灣目前最低工資是月薪24000元或時薪160元。因此，每人每天使用臉書的機會成本是 $160 \text{元} \times 1/5 = \$32$ 。整體經濟的總機會成本超過**3億2千萬元!**

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## Opportunity costs

- Opportunity cost is **not the same as** the accounting cost:

Think: what is the opportunity cost to see a movie (when it is **not free**)?

Opportunity cost = **explicit** cost (accounting cost) + **implicit** cost  
 = the ticket price + the money that you could have made from working.

例如：念博士的機會成本

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## Optimization

- Cost-Benefit Analysis: 成本效益分析

A calculation that adds up costs and benefits using a common measurement, usually “money”.

成本效益分析是衡量各個選擇、並決定最適選擇的方法。

- The report “The global economic impact of Facebook” by Deloitte (2015):  
 “FB connects 1.3 billions of people in the world. It creates **\$227** billions economic impact and **4.5** millions of job opportunities.”
- Is FB good for you? How many hours is optimal to be spent on FB?

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Q：20年前Mike用1,000元買了一瓶酒。  
今天Mike發現它的市價已經是10,000元。  
如果Mike今天決定把這瓶酒喝了，他的  
機會成本是多少？

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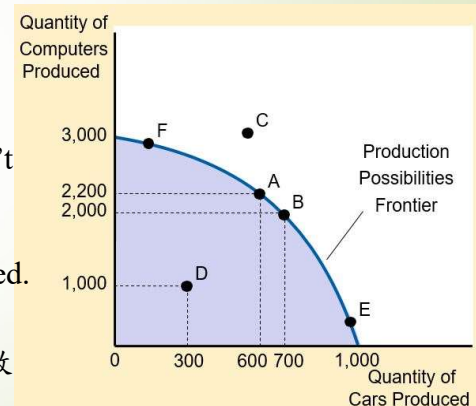
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## Production Possibilities Frontier

### The production possibilities frontier (PPF) 生產可能曲線

- PPF shows the relationship between the maximum production of one good for a given level of production of another.
- Points on the PPF, such as A, B, E, F are **attainable and efficient**.
- Points inside the PPF, such as D, are attainable but **not efficient** because it doesn't use all resources.
- Points outside the PPC, such as C, are **unattainable** because they cannot be achieved.

生產可能曲線是在一定資源和技術條件下，  
經濟個體或國家所能生產的各種商品最大數  
量的組合。

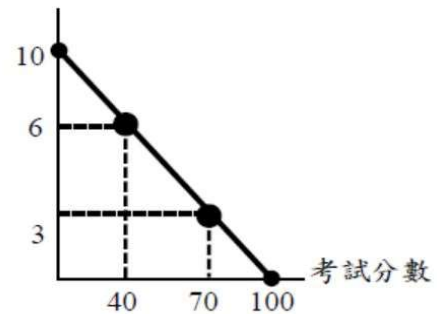


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## Production Possibilities Frontier

- 某生在有限時間下，其產出學習歷程檔案件數及考試成績的PPF如下圖：
- 學習歷程檔的機會成本 =  $\frac{\text{考試成績的減少}}{\text{學習歷程檔的增加}} = \frac{40-70}{6-3} = -10$  (PPF的斜率)
- 產出1件學習歷程檔的機會成本是考試分數10分
- Is it worth it? Depends on the benefit (the relative weights that professors will use)

學習歷程檔件數



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你覺得準備學測考科跟準備學習歷程檔，  
哪一個更重要一些？

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## Equilibrium

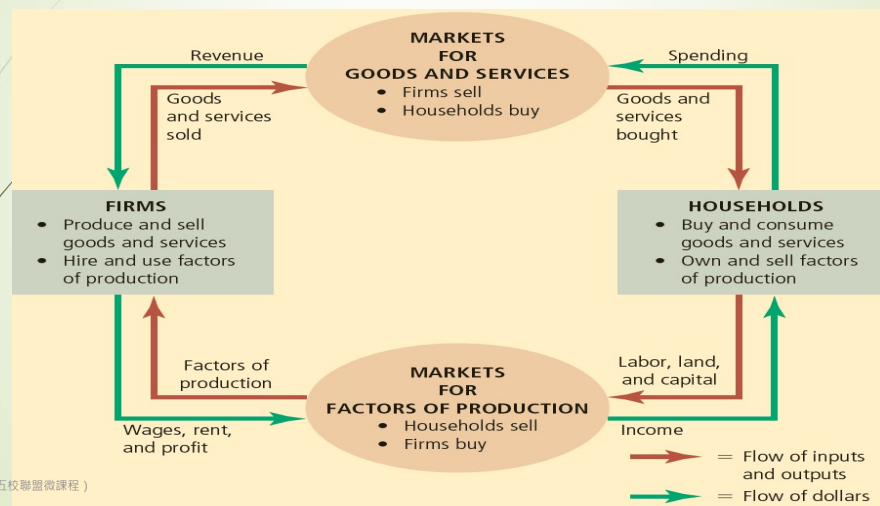
- Market: a place where people make transactions. 市場  
For example, in a gasoline market, there are suppliers and demanders.
- Oil companies (suppliers) 供給者
  - Produce gasoline
  - Hire workers or use capital
- Households (demanders) 需求者
  - Purchase gasoline
  - Provide labor services

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## Equilibrium

The Circular-Flow Diagram :



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## Equilibrium

The situation in which **everyone is optimizing**, so nobody would benefit personally **by changing his or her own behavior**.

均衡是所有人都在極大化自身利益，而沒有人能從改變均衡行為中得到好處。

- Conditions for the equilibrium:

- The oil companies which operate wells make some (or at least zero) profit by producing gasoline. (**sellers' optimization**)
- The households who purchase gasoline will gain by buying gasoline. (**buyers' optimization**)
- The amount of gasoline produced by sellers (oil companies) equals to the amount purchased by buyers. (**quantities supplied = quantities demanded**)

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## Who is the player?



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圖中的人是誰?

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## Why do people trade?

Joe Lacob (勇士隊老闆):

*“Look, the Warriors probably aren’t trading for Ben Simmons...He’s very talented. The problem is: **We have Draymond.**”*

結果：Joe Lacob違反anti-tampering rule (反引誘條例) 被罰款5萬鎊

Key point of trade: **we want something we don’t have**



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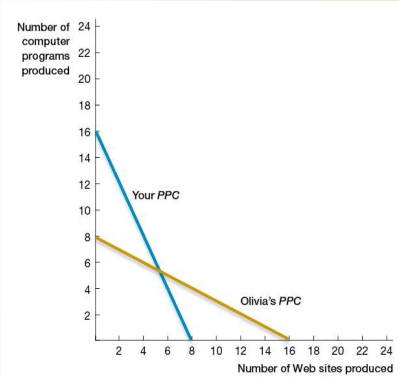
## Gain from Trade

- You and your friend, Olivia can produce both website designs and computer programs.
- Yours PPF:

	You	Olivia
Web sites	8	16
Programs	16	8

- Is there any way to minimize your work time?  
**Specialization and trade!**

藉由專業分工與貿易可以幫助交易雙方都變好。

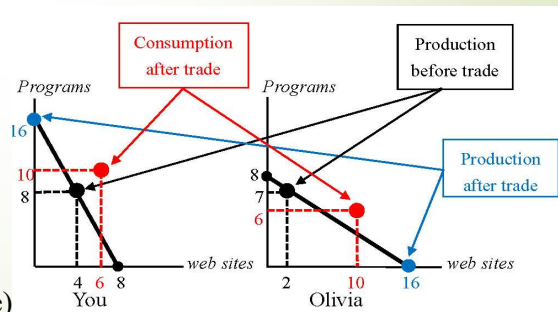


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## Gain from Trade

- Here we show how people be better off **by specialization and trade**.
  - Suppose that in the beginning that you produce at  $(w, p) = (4, 8)$ , and Olivia produces at  $(w, p) = (2, 7)$ .
  - Now you **specialize in producing programs** and Olivia **specializes in producing web sites**.
  - Then you trade 6 programs in exchange for 6 web sites from Olivia (exchange rate = 1:1).
  - By doing so, you enjoy  $(w, p) = (6, 10)$  and Olivia has  $(10, 6)$ .
  - You both are better off!** (to the points you couldn't reach before)



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## Gain from Trade

- The gain from trade (貿易利得):

		Before trade	After trade			Gain from trade	
		Production and consumption	Production	Trade	Consumption		
You	Web sites	4	0	+6	6	+2	+4
	programs	8	16	-6	10	+2	
Olivia	Web sites	2	16	-6	10	+8	+7
	programs	7	0	+6	6	-1	

經由專業分工並同時進行貿易(在適當的交易條件下)，雙方都得到貿易前所不可能達到的消費量。雙方都因此變好，獲取貿易利得。

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## Comparative advantage

- Absolute advantage:** the ability of an individual or country to produce a good **using fewer inputs** than another producer. (Adams Smith)
- Comparative advantage:** the ability of an individual or country to produce a good at a **lower opportunity cost** than another producer. (David Ricardo)
- An individual or country can have absolute advantage in both goods but **cannot have comparative advantage in both goods.**

當一個個體或國家生產一種物品所需要的**投入較另一個體或國家少**時(即其生產技術較好)，就擁有生產這種產品的**絕對利益**。

即使一個個體或國家在每個產品的生產技術都比另一個體或國家差，但只要劣勢程度有別，仍然可以有**相對另一個體或國家機會成本較低**的產品，即為其擁有**比較利益**的產品。

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## Comparative advantage

### ● Opportunity cost:

- You have the comparative advantage (at a lower opportunity cost) in producing computer programs, and Olivia has the comparative advantage in creating web sites.
- **Principle of comparative advantage:** each good is produced by the individual or country who **has the smaller opportunity cost** of producing that good.

比較利益法則：每個個體或國家應專業生產於其機會成本相對較低的財貨。

	Web sites opportunity cost	Programs opportunity cost
You	2 programs	½ web sites
Olivia	½ programs	2 web sites

你生產programs的機會成本較Olivia低，因此應該專業生產programs；Olivia生產web sites的機會成本較你低，因此應該專業生產web sites。

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## Trade History of Taiwan

### ● 比較利益的應用：台灣貿易史

- 日治時期，茶、糖與樟腦是台灣最重要的出口品。初期以茶最重要（占出口一半以上），後期則以糖為最重要。
- 1950年代政府改變貿易政策，由「進口替代」政策改為「出口擴張」政策，此後紡織品漸漸成為出口主力。
- 1960年代中期以後外商在臺投資電子加工業，電子產品漸漸成為出口的主力。
- 1970年代出口的重要商品除紡織及電子產業外，還有勞力密集產品如玩具、運動器材、腳踏車、塑膠加工品、五金等。
- 1980年代後則是出口電子電機產品，資訊產品興起。此後高資本密集度商品占出口的比率不斷上升，而低資本密集度商品的比率則逐漸下降。

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## Trade History of Taiwan

### ● 比較利益的應用：台灣貿易史

表 5.2 臺灣出口商品別 1896~1940 年

	出口總值 (千圓)	米 (%)	茶 (%)	糖 (%)	樟腦 (%)	其他 (%)
1896	11,396	8.0	51.4	13.4	21.5	5.7
1900	14,934	15.9	32.3	14.8	15.6	21.4
1905	24,291	24.3	26.1	24.2	11.1	14.3
1910	59,962	11.7	10.7	58.9	6.6	12.1
1920	216,265	7.9	3.1	65.8	3.5	19.7
1930	241,441	16.0	3.7	58.8	1.0	20.5
1940	566,054	15.5	3.7	39.3	0.8	40.7

資料來源：周憲文（1958）

劉碧珍等：國際貿易導論

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## Trade History of Taiwan

### ● 比較利益的應用：台灣貿易史

表 5.3 臺灣各年主要出口產品

單位：百萬美元

年代	出口總值	農產品*		紡織皮革木紙製品**		電子電機產品	
		出口值	(比率)	出口值	(比率)	出口值	(比率)
1955	123	111	(90.2%)	3	(2.4%)	0	(0%)
1965	450	243	(54.0%)	118	(26.2%)	12	(2.7%)
1975	5,309	868	(16.3%)	1,997	(37.6%)	741	(14.0%)
1985	30,726	1,879	(6.1%)	8,601	(28.0%)	5,740	(18.7%)
1995	111,659	4,284	(3.8%)	17,159	(15.4%)	31,032	(27.8%)
2005	198,432	2,490	(1.3%)	12,235	(6.2%)	72,009	(36.3%)
2010	274,601	2,921	(1.1%)	11,643	(4.2%)	103,167	(37.6%)

資料來源：Taiwan Statistical Data Book

\*包括農產及農產加工品。

\*\*因統計方式改變，自 1985 年起資料只含紡織、成衣、製鞋及合板；早期資料含皮革及家具等。

劉碧珍等：國際貿易導論

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## Trade History of Taiwan

### ● 比較利益的應用：台灣貿易史

表 5.4 臺灣出口商品資本密集度分布 單位：%

年度	高資本密集度	中資本密集度	低資本密集度
1985	24.5	48.7	26.8
1990	28.9	50.5	20.5
1995	31.9	56.5	11.6
2000	33.0	60.9	6.2
2005	52.0	44.1	3.9
2010	58.9	38.2	3.0

資料來源：Taiwan Statistical Data Book, 2000, 2011.

劉碧珍等：國際貿易導論

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## Empiricism

Any theory with should be evidence-based. 實證經濟學

任何理論都需要有現實生活中的證據(或資料)支持。

- We use **data** to determine whether our theories about human behavior match up with actual human behavior.
- If our theories fail to explain the data, we need to come up with better theories.
- We also want to know the **causation** of things that have happened.

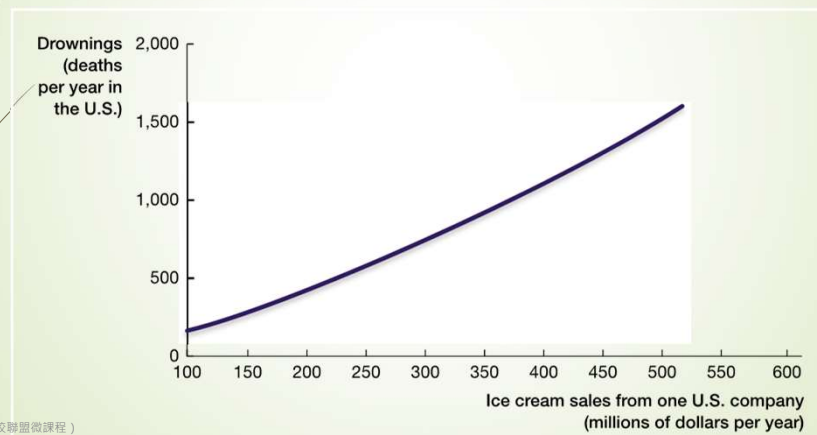
兩個事件有關聯(correlation)並不表示兩者間有因果關係(causation)

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## Empiricism

➤ Correlation  $\neq$  Causation (相關 $\neq$ 因果關係)



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slido



下列何種狀況最可能在描述「因果關係」？

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## What can Economics do for you?

- You should be able to apply the economic reasoning to analyzing problems in your daily life.
- See through and predict other people's behavior by using economics analysis.
- Use economic principles to make a wise decision, and further give advice to other people like the government for them to make better choices.

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## Main concepts of this part

- Positive vs. normative analysis
- Optimization
- Opportunity cost
- Production possibility frontier
- Equilibrium
- Gain from trade
- Comparative advantage
- Empiricism

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