

外部性

1. Introduction

- Def: 一人之行動 (生產/消費) 未經市場機能而影響他人之效用或利潤

2. Taxonomy

- Pecuniary externality (價格外部性): effect thru market transaction
 - Market demand/price change
 - Gold, stock, antique, housing
 - Influence thru “budget constraint”
 - Market still efficient:

$$MRS_i^{x,y} = MRT_i^{x,y}$$

- Physical externality (實質外部性): no market transaction
 - ▷ Market outcome inefficient
 - Constructor/dentist, train/corn field, pollution, noise
 - Commons/CPR: Traffic jam, open-water fishing, air pollution

- Negative/Cost v. Positive/Benefit externalities¹

☐ Crime prevention:²

Externality	Negative	Positive
Function	轉移目標	嚇阻犯罪
Car theft protection	“Club”	“LoJack”
Home protection	鐵門鐵窗	警衛巡邏

- Consumptive v. Productive externalities: who causes it?

	Producer	Consumer
Producer	constructor / dentist train / cornfield beekeeper / orchardist burger shop / barber shop	pollution noise
Consumer	noise	noise, smoking 賄選買票

¹Or external economy v. diseconomy.

²See: *Superfreakonomics*, Ch.5 (中文版:《超爆蘋果橘子經濟學》, 時報出版, 頁 242-244)

3. Extensions

- More efficient resource allocation with market:
 - Waiting queues (physical pain) v. ticket scalpers (price/auction)³
 - 加價升等病房: 「不公平... 捐十萬可升等病房... 大廳刻金主姓名... 搞階級化」可罰?⁴
- Can/should markets be prohibited?⁵
 - Prostitution: voluntary transaction, “crime without victims”
(March 2008: NYC mayor Eliot Spitzer)
 - Marriage for sale: buying a relationship (通姦除罪化)
 - A myth: “two friends eating shits”
 - Admission tips: restaurant/bar doorman
 - Theme park: waiting lines
 - Carpool: hiring someone to ride with you
- Children bearing: the case of Singapore
 - ▷ Tax penalty for couples without children
 - ▷ Tax subsidy for couple bearing children under 25 yrs old

³For efficiency, S.E Landsburg suggests the “last come, first serve” rule. As no more time will be lost waiting in line.

⁴2013.10.16 蘋果日報 (沈能元, 台北報導) 健保財務拮据, 醫院自闢財源, 衛生福利部雙和醫院將捐款人姓名刻在大廳牆上, 並讓他們享更多醫療服務、折扣, 民間團體痛批該院為衛福部委外經營, 政府竟帶頭違法, 以捐款之名銷售醫療商品, 極不可取。衛福部指此做法已給人醫療階級化印象, 應檢討; 若新北市確認該院違反《醫療法》, 可開罰 5 萬至 25 萬元。

雙和醫院比照廟宇做法, 將捐款一定金額者的名字, 刻在醫院大廳走廊牆壁上, 外傳只要十萬至百萬元不等的捐款金額, 捐款者到院看病時可享專人陪同就醫、醫療自費項目九折、每年兩次尊貴健檢等服務與優惠, 若需住院則有機會優先從四人健保床, 升等至雙人或單人病房。

慈濟醫療體系也有「慈誠」會員制度, 每年捐款給慈濟基金會一定金額者, 至慈濟醫療體系醫院就醫, 除有專人引領、陪同就醫, 醫療自費項目也可打九折。民間監督健保聯盟發言人滕西華昨痛批, 雙和醫院為衛福部委託台北醫學大學經營, 現任衛福部長邱文達曾任北醫大校長、雙和醫院院長, 政府竟帶頭違法, 讓醫院以捐款之名, 實際銷售醫療商品, 「非常不可取」。... 衛福部醫事司副司長王宗曦指, 雙和醫院若真有此做法會讓人感覺差別待遇, 給人醫療階級化印象, 應檢討; 將要求該院提供接受捐款的明細、流向報告, 也建議院方以適當方式自行公開, 以昭公信。至於雙和醫院讓捐款者享醫療費用打折, 疑涉違反《醫療法》規定, 醫療廣告不得以不正當方式宣傳, 新北市衛生局副局長林金富說, 將了解、並要求院方說明, 若調查違法屬實, 可開罰院方 5 萬至 25 萬元。民眾張玉華說:「有錢人只要捐款, 就可獲得較好醫療服務, 沒有錢的小老百姓只能自求多福, 醫院做法真的很不公平, 相關單位應管一管。」

⁵請參閱:《錢買不到的東西: 金錢與正義的攻防》, Michael J. Sandel, 先覺出版, 2012.10。原文版: “What Money Can’t Buy: The Moral Limits of Markets”, Michael J. Sandel, Farrar, Straus and Giroux, April 24, 2012.

- Related topics:

1. Matching/mating theory (2012 Nobel Prize)
2. Bergstrom: Rich old men v. Pretty young women⁶

⁶The logic is:

	Value	Info	Timing
Male	financial	private	wait or not?
Female	reproduction	public	don't wait

4. Other Externalities

- Network externality: effect depends on group size⁷ Figure 1
 - Join the bandwagon (隨眾偏好, 求同):⁸
 - ▷ Outcome inefficient if bad protocol/standard is adopted.
 - ▷ *Critical mass* threshold
 - Stand out alone (特立獨行, 求異)⁹
- Position externality (位階外部性):
 - Positional good: one whose utility depends strongly on how it compares with others in the same category.¹⁰
 - E 軍備競賽, 結婚禮金, 整型隆乳, 名牌衣物, 子女學校, 豪宅名車
 - Happiness/satisfaction:
 - ▷ Trend: *across time* v. *same period*
 - ▷ *Relative* v. *absolute* position
 - Equilibrium is *Pareto inferior*
 - ▷ Similar to the Prisoners' Dilemma (PD) result¹¹

⁷Thomas C. Schelling, 2005 Nobel, U.Maryland.

⁸For example: language (Mandarin v. Taiwanese), computer system (Windows v. Unix), web auction platform (Yahoo v. eBay), cell phone (網內互打), exam cheating, jay walking, traffic light, end-of-show applause, 房屋買賣仲介.

⁹For example: dressing, hair style, car choice, holiday.

¹⁰For example, if some job candidates begin wearing expensive custom-tailored suits, a side effect of their action is that other candidates become less likely to make favorable impressions on interviewers. From any individual job seeker's point of view, the best response might be to match the higher expenditures of others, lest her chances of landing the job fall. But this outcome may be inefficient, since when all spend more, each candidate's probability of success remains unchanged. All may agree that some form of collective restraint on expenditure would be useful. See: Robert H. Frank, *JPubE*, 2008, V92, pp. 1777–1786.

¹¹Or, as Frank puts it: "As in the familiar stadium metaphor, all stand to get a better view. But when all stand no one sees better than when all were seated."

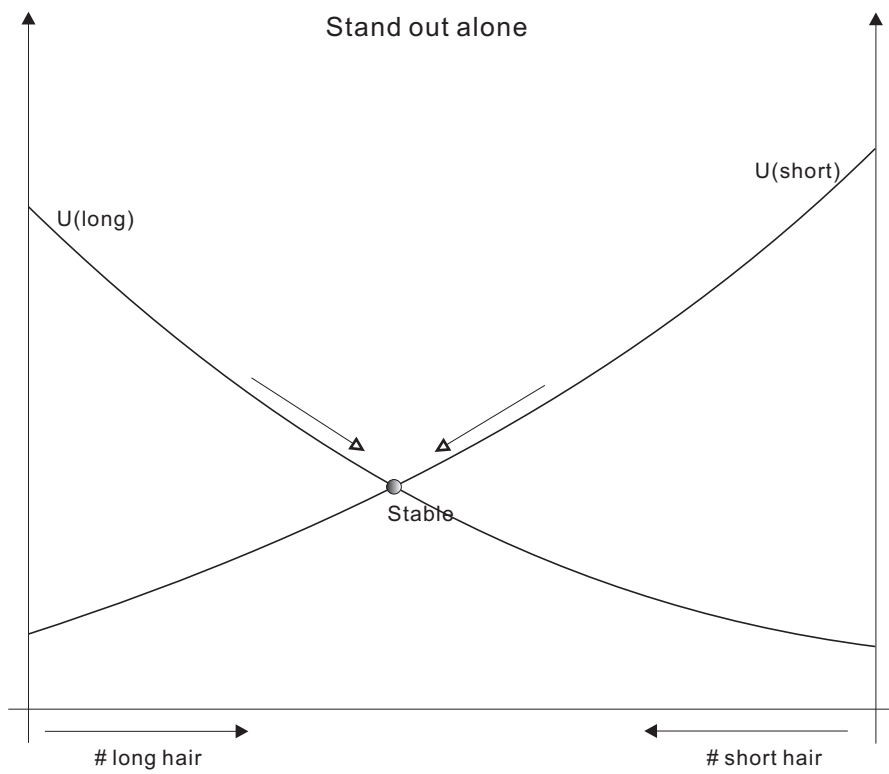
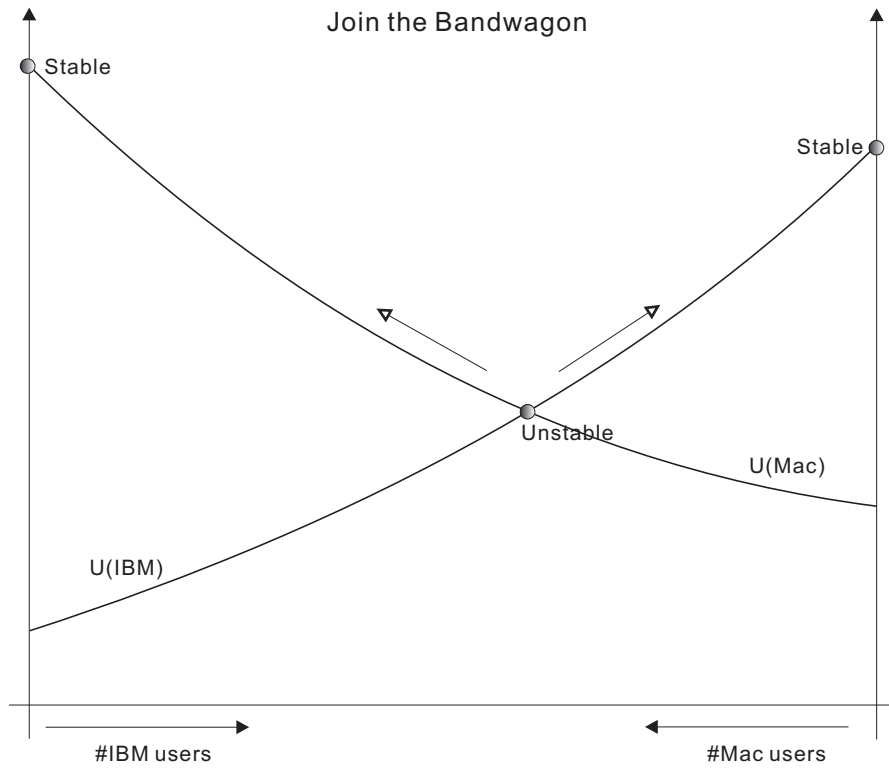


Figure 1: Network externality

- Government policy:
 - ▷ Luxuries are more positional than necessities.
 - ▷ Steeply progressive general consumption/expenditure tax
- Nature of externality:
 - Reciprocity: “right to smoke/pollute” v. “right to be free from pollution”
 - Property right not established: no market for transaction
 - ◻ Air, open-water fishing, endangered species
 - Policy criteria: economic efficiency (min TSC)

5. Optimality

- Efficient level q^* :

$$MSB(q^*) = MSC(q^*)$$

$$\sum_i MB_i(q^*) = \sum_i MC_i(q^*)$$

- Negative externality: marginal external damage (MED)

E Pollution

- Firm choice:

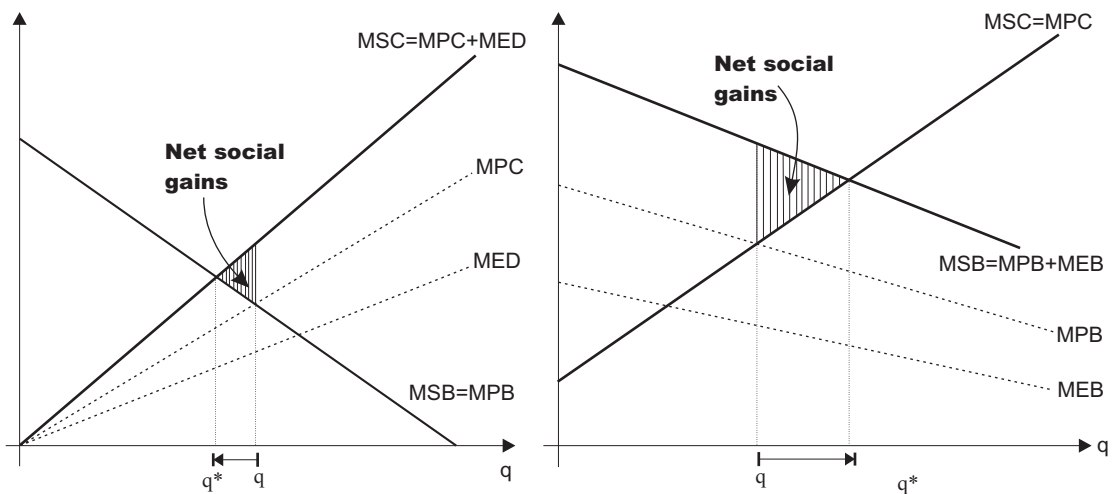
$$MPC(q) = MPB(q)$$

- Efficiency:

$$MSC(q^*) \equiv MPC(q^*) + MED(q^*) = MSB(q^*)$$

- Activity should contract!

! 2nd-best policy: if prior market distortion already exists



- Positive externality: marginal external benefit (MEB)

□ Bee/orchard

- Firm choice:

$$MPC(q) = MPB(q)$$

- Efficiency:

$$MSC(q^*) = MSB(q^*) \equiv MPB(q^*) + MEB(q^*)$$

- Activity should expand!

□ Vaccination: prob(you become ill) depends on %populatr vaccinated

$$SW(\text{mandatory}) < SW(\text{voluntary}) < SW(\text{PO})$$

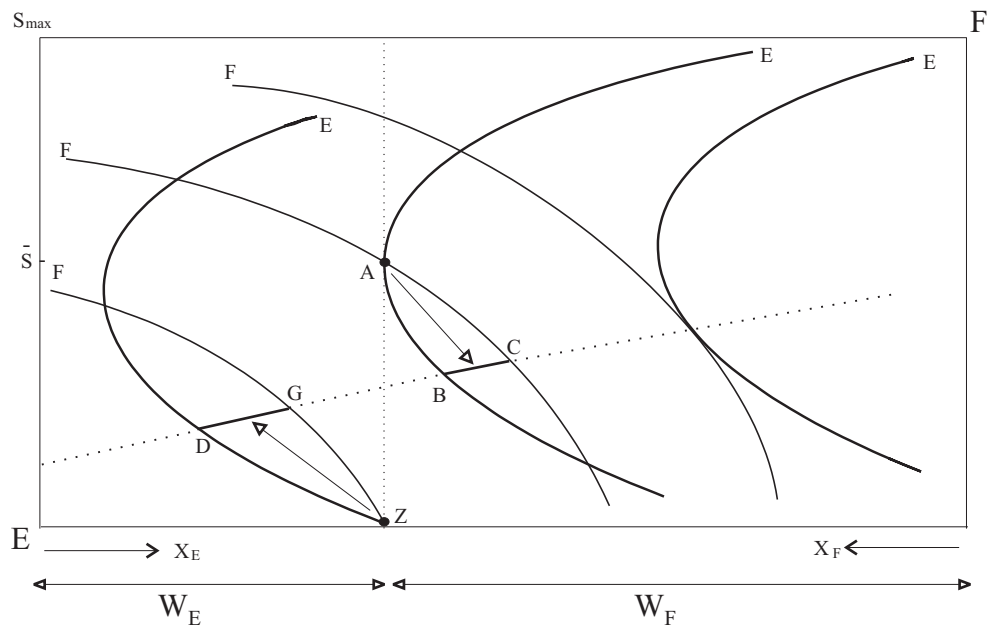
- ▷ Subsidy on vaccination □

□ Lansburg: *More sex is safer sex?*¹²

¹²中文版: 《反常識經濟學》, 2007, 時報文化出版。

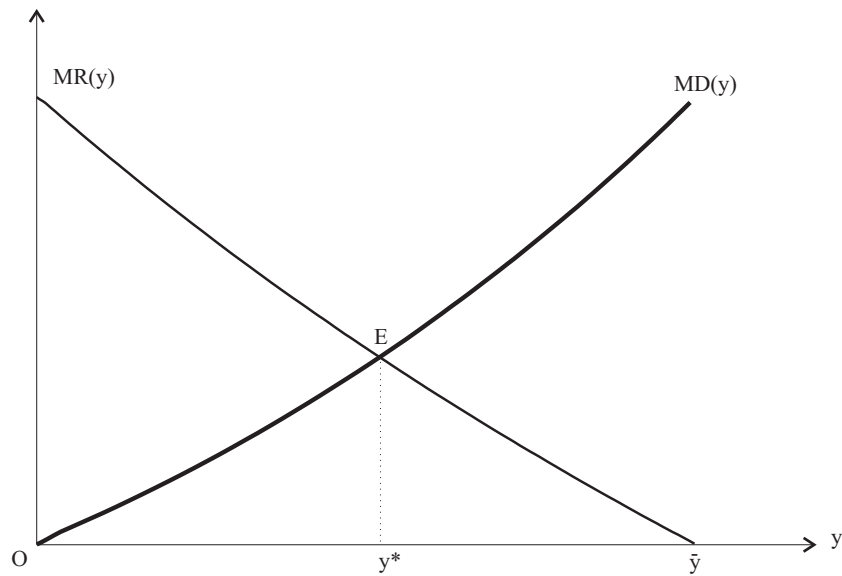
6. Private Solution

- Coase bargaining (寇斯協商): contractarian solution
 - Relevant when:
 - * Few people involved
 - * Transaction cost low
 - Property right assignment will not affect efficiency
 - Income redistribution effect
 - 2-player example:



	Smoking “allowed”	Smoking “not allowed”
No negotiation	A	Z
Negotiation possible	BC* (F pays E)	DG* (E pays F)

- Coase revisited:



- Merger (公司購併):

- Externality is *internalized*
- Will set:

$$MTC \equiv MPC + MED = MTB$$

- Applicability: few firms involved, low administrative cost

- Social convention/norm (社會規範):

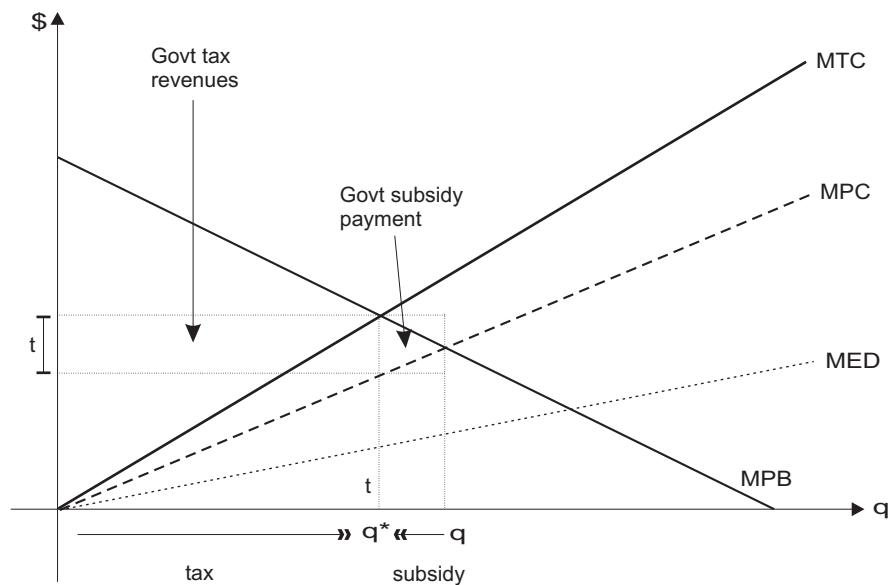
? May not arrive at optimal level of activities

? Not reliable!

7. Government Intervention (政府干預)

- Direct control (直接數量管制): *firm-specific* q_j^*
 - Firm-identical regulation inefficient!
 - Low-cost firms cut back more. Controversial and unfair?
 - Administratively infeasible with many polluters!
- Economic incentives (經濟誘因): *price mechanism*
 - Govt goal: $MPB = MPC + MED$
 - Firm goal: $MPB = MPC$
 - Pigouvian tax (排放課稅): per unit emission

$$t^* = MED(Q^*)$$



* 2 interpretations:

Ⓐ Firm MC ↑:

$$\text{MPC}'(q) = \text{MPC}(q) + t$$

▷

$$\text{MPC}'(q^*) = \text{MPB}(q^*)$$

Ⓑ Firm MR ↓:

$$\text{MPB}'(q) = \text{MPB}(q) - t$$

▷

$$\text{MPC}(q^*) = \text{MPB}'(q^*)$$

* Long-run impact: industry profit ↓

▷ firms exit (market contracts)

* Same effect as firm-specific direct control

☐ Pigou v. Friedman: *Two Lucky People* [中文版 pp.84–85]

– Subsidy (減量補貼): per unit reduction below \bar{Q}

$$s^* = \text{MED}(Q^*)$$

* 2 interpretations:

Ⓐ Firm opportunity cost ↑:

$$\text{MPC}'(q) = \text{MPC}(q) + s$$

Ⓑ Firm profit ↓:

$$\text{MPB}'(q) = \text{MPB}(q) - s$$

▷ $s^* = t^*$, same rate !

- * Long-run impact: industry profit \uparrow
 - ▷ Entry: market grows
- * How to finance govt subsidy payment? \Rightarrow additional DWL
- * Politics/ethical consideration: tax \succ subsidy
- Extreme environmentalists: prefer “fine” to “tax”

– Market creation (創造外部性之交易市場)

- * Tradable/transferable permits (可轉售污染許可證): bankable?
- * Bubble (污染泡) policy
- * Correct issuance $Q^* \Rightarrow$ Price determined in permit market
- * Initial assignment doesn't matter! Firms will trade!

□ Measurement of MPR/MPC/MSD difficult!

8. Equity

- Income redistribution effect (所得重分配效果)
- Who benefits?
 - Urban: poor households (more exposure to local air degradation)
 - Suburban: wealthy families (enjoy NPs more)

☐ Michigan MDNR v. Ludington power plant

- Who pays for the costs?
 - Poor workers: laid off as market contracts [job blackmail?]
 - Consumers: higher prices

☐ Robison [1985] % income reduced by anti-pollution:

$$1\%(\text{poor}) > 0.22\%(\text{rich})$$