

Law Economics - Intellectual property

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Importance

- 若沒有 IP law ，知識是公共財
- 從 ex post 的角度，沒有智慧財產，對其他廠家與所有消費者有利
- 從 ex ante 的角度，沒有智慧財產，對於投資於R&D的資源無法被optimize

Two proposes of IP law

- Promote innovation
- Protect the integrity of markets

INNOVATION



Denison (1985)
research

Productivity group in US Between 1929-1982

- 68% of productivity gain due to advances in scientific and technological knowledge, 34% due to improved worker education, 22% due to greater realization of scale economies, and 13% attributable to increased capital intensity

Defects & Virtue

Defects

- Deadweight loss to consumers
- inhibit the use of scientific or tech. knowledge for further research
- Maybe a lots of firms doing the same research

Virtue

- "Every" invention create Pareto improvement
- Decentralization. if it's public goods, it should be publicized
- Inventions bearing high costs . decide carefully!

Motivation

- technical change occurs in response to changes in factor prices: “A change in the relative prices of the factors of production is itself a spur to invention and inventions of a particular kind— directed at economizing the use of a factor which has become relatively expensive.”

如果油價太貴就會有人有誘因發明其他替代品，或是更省油的技術，對全體福祉增加

An overview of
the principal IP
regimes
promoting
innovation and
creativity

- Patent: 設計允許 cumulative innovation, short period(20 years)
- Copyright: exclude innovation from this piece, protect creator
- Trade secret law: 不像patent 需耗時且須公開, 也算是對公司IP的保護

抱歉... 今天只講這個



Stand-alone innovation VS. Cumulative innovation

- The focus for stand-alone innovation is upon ex ante incentives.
- all of the results in this area depend sensitively profit on what is assumed about licensing.
- When we turn to cumulative innovation, ex post incentives enter the analysis.
- affecting incentives to invent are the threshold for protection, duration, breadth, rights of others

Difference

Goldstein, 1986

Patent

- 著重效率與新一代科技的創新，所以好的>比較不好的。價值一分高下
- the role of patent and trade secret law is to direct investment toward such improvements.

Copyright

- 但Copyright 注重多元
科幻小說不會大於寫實小說
- The aim of copyright is to direct investment toward abundant rather than efficient expression

Difference

Goldstein, 1986

Patent

- Deadweight loss 高
- 門檻高，審核制度嚴
- 為保護total benefit

Copyright

- Deadweight loss 低
- 門檻低，進入審核鬆

Trade secret law

- 有爭議再處理，經濟成本很低

History & other discovery

- 20th 世紀前，目的保護機械發明，但已有越來越多迭代率高的領域進入（如晶片、疫苗），可依照產業縮短保護期，可減少DWL
- 美國專利採取第一優先權者（舉證先發明者得專利），這在法院上訴訟判決成本極高。但對於小發明者較有利，不用怕被公司火速申請搶專利。
- 有些公司會故意延後申請專利，來延後失效期。
- Trade secrecy VS. disclosure
- 現行：發明一年內一定要申請專利

Court standard

- 對於專利權的配發標準一直是被經濟學家所質疑的
- Oddi(1989)：發現研究者會傾向於發明地利潤、低風險的發明。因為不確定是否要投入大量金錢，搞不好還不會被法院認可。
- 自1982年聯邦巡迴法院成立之年起，專利無效的比率就直線下降
- Non-obviousness hurdle 仍然是在審判和上訴層面上使專利無效的最常見理由（無效判決的42%），但在提出時經常失敗（63.7%）。

Nordhaus' model

Optimal duration of IP protection

- 對於獨立發明最適合的保護期
- 準備好了嗎？



S : 發明的 value C : 發明的 cost

$\Pi(s, T)$: 擁有 patent 者在 T 時間內, 透過 S 的 profit

$W(s, T)$: $CS + PS - dWL$ in protection period increase in S
decrease in T

$f(s|c)$: 機率分佈 $s > c$ 的片段

$\hat{W}(T, c)$: 發明的 social welfare

$\sigma(T)$: 會願意投資的最低 value ($\Pi(\sigma(T), T) = c$)

$$\hat{W}(T, c) = \int_{\sigma(T)}^{\infty} [W(s, T) - c] f(s|c) ds$$

偏微分:

$$\frac{\partial}{\partial T} \hat{W}(T, c) = \int_{\sigma(T)}^{\infty} \frac{\partial}{\partial T} W(s, T) f(s|c) ds - W(\sigma(T), T) \sigma'(T)$$

Policy Leverage

- 剛剛說的：duration
- 即專利的保護時效
- 跟breadth
- 即專利的使用寬度或範圍

Consider about
breadth

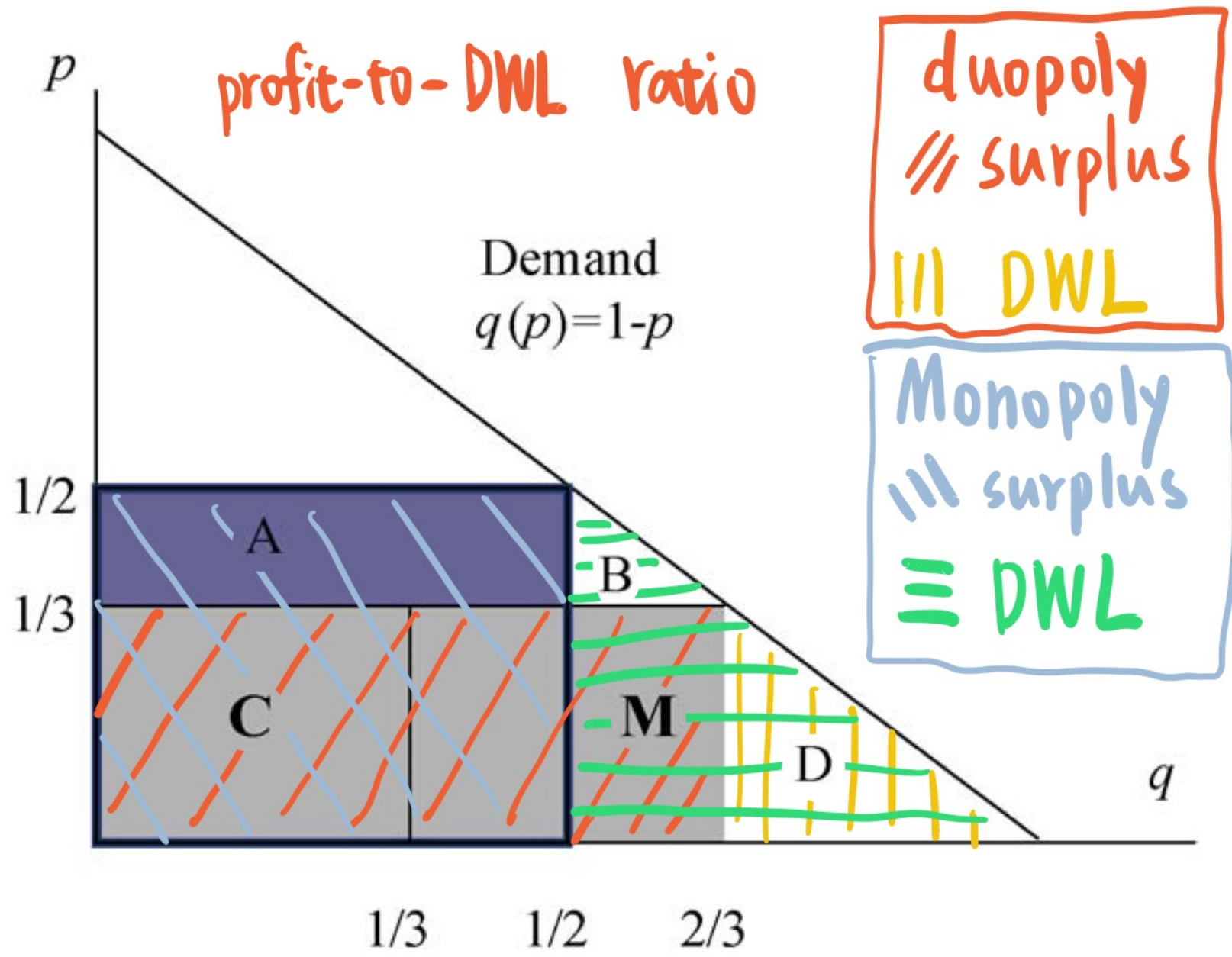
Optimal duration of IP protection

- Klemperer(1990):用市場上的substitute 的數量評估這個專利，有沒有其他類似的商品
- Gallini(1992):進入市場的成本，較窄的專利範圍導致更小的進入成本與更低的價格
- 類似於如果可以走一些旁門走道繞過這個專利，那就代表這項專利寬度較窄。

Help from breadth

- 這樣上述取得專利的方面只要好好審查，不需要為之後的事負責
- 如果許可的話，最好是讓廣度窄一點，讓多加一點廠商進入市場，才不會產生過多的獨佔DWL。
- 但仍然需保障專利者的profit，所以可以延長duration的期限。

Profit-to-dead-weight-loss ratio



Conclusion

“The better policy is a narrow patent for a relatively long time.”

Q&A

Thanks for your listening!