

# 2.6 – Intellectual Property

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# Outline



Sequential Games

The Problem With Ideas

Patents

Copyrights

Interlude: Intellectual *Property Rights*?

Trademarks

Trade Secrets

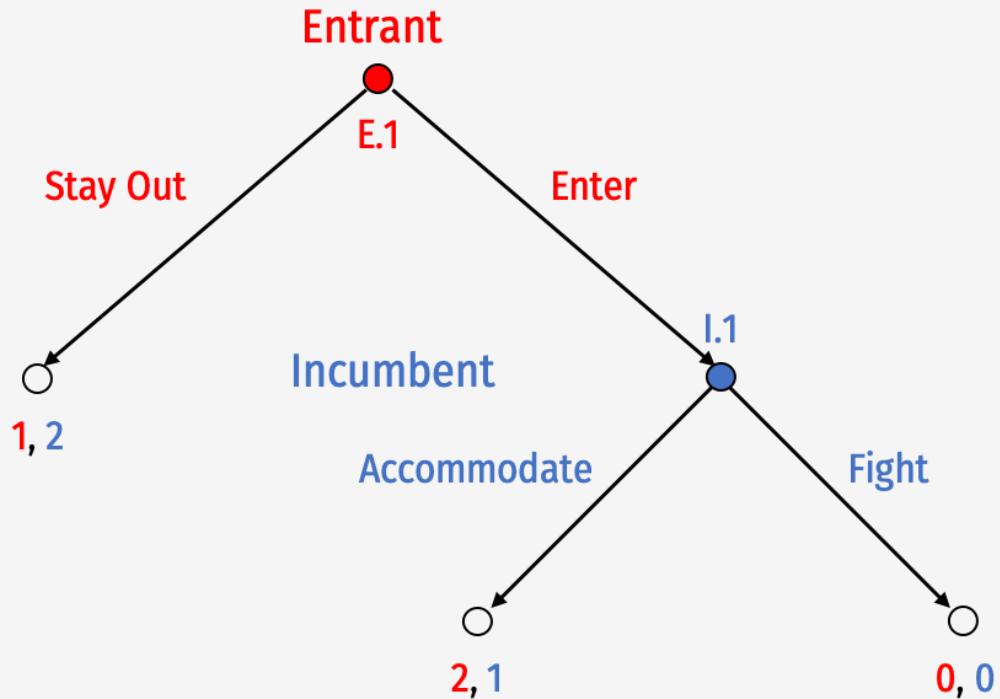


# Sequential Games

# Sequential Games: Extensive Form



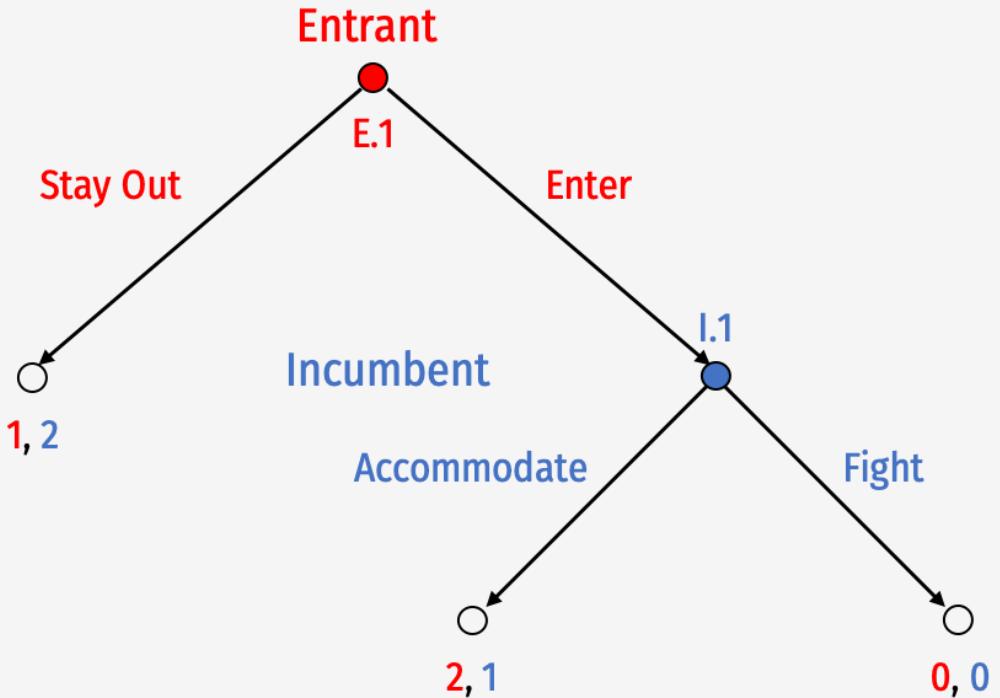
- We consider an **Entry Game**, a **sequential** game played between a potential **Entrant** and an **Incumbent**
- A sequence of play: **Entrant** moves first, **Incumbent** moves second
- Note: the magnitude of the payoffs don't really matter, only their *relative sizes*
  - Hence, my simple numbers



# Pure Strategies



- This game is depicted in “Extensive form” or a game tree
- Each player faces at least one “decision node” (solid, colored by player)
  - Entrant chooses between Enter or Stay Out at node E.1
  - Incumbent chooses between Accommodate or Fight at I.1
  - Game ends at any “terminal node” (hollow), and each player earns payoffs (Entrant, Incumbent)

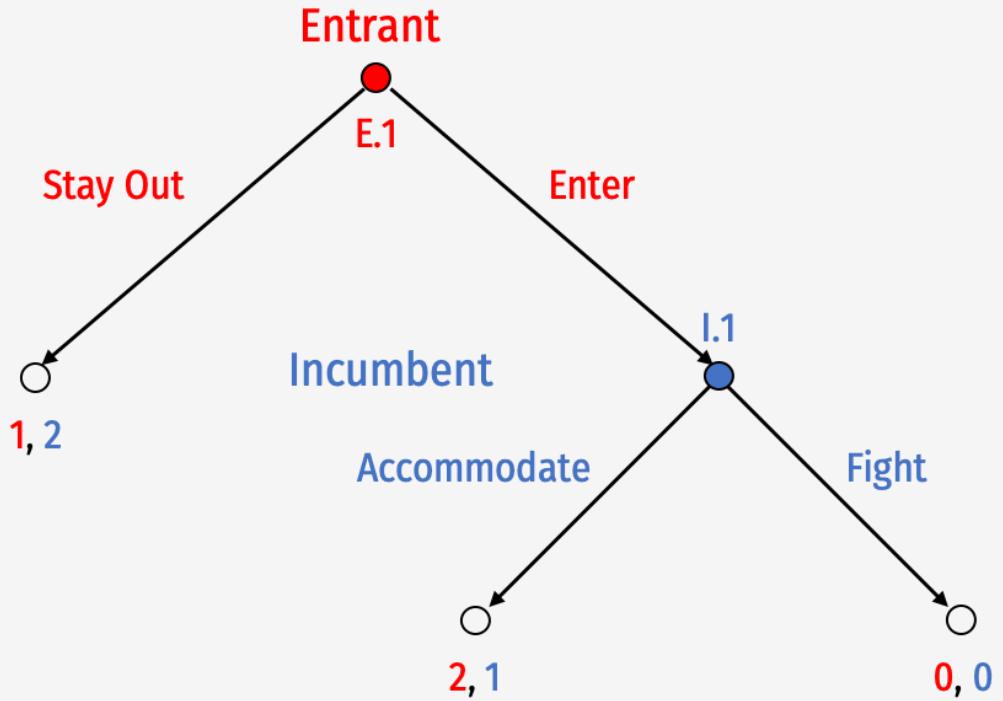


# Pure Strategies



- We need to talk more about **strategies**
- “**Pure**” **strategy**: a player's *complete* plan of action for every possible contingency
  - i.e. what a player will choose at *every* possible decision node; think like an **algorithm**:

If we reach node 1, then I will play X;  
if we reach node 2, then I will play Y;  
if ...
- “**Mixed strategy**”: play a strategy with some probability



# Solving a Sequential Game

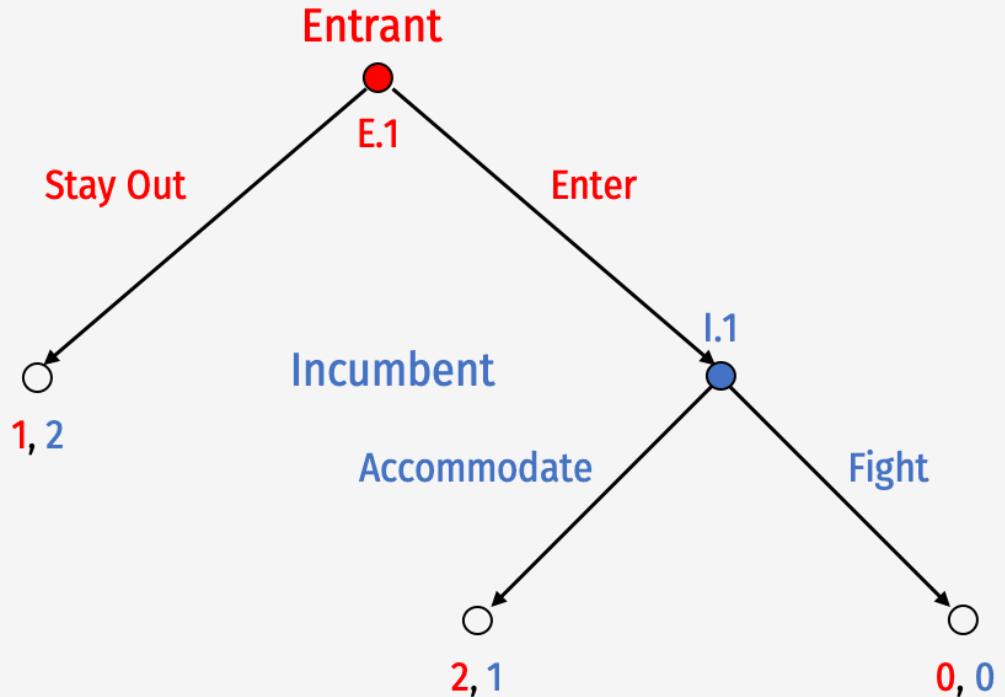


- **Entrant** has 2 pure strategies:

1. **Stay Out** at E.1
2. **Enter** at E.1

- **Incumbent** has 2 pure strategies:

1. **Accommodate** at I.1
2. **Fight** at I.1



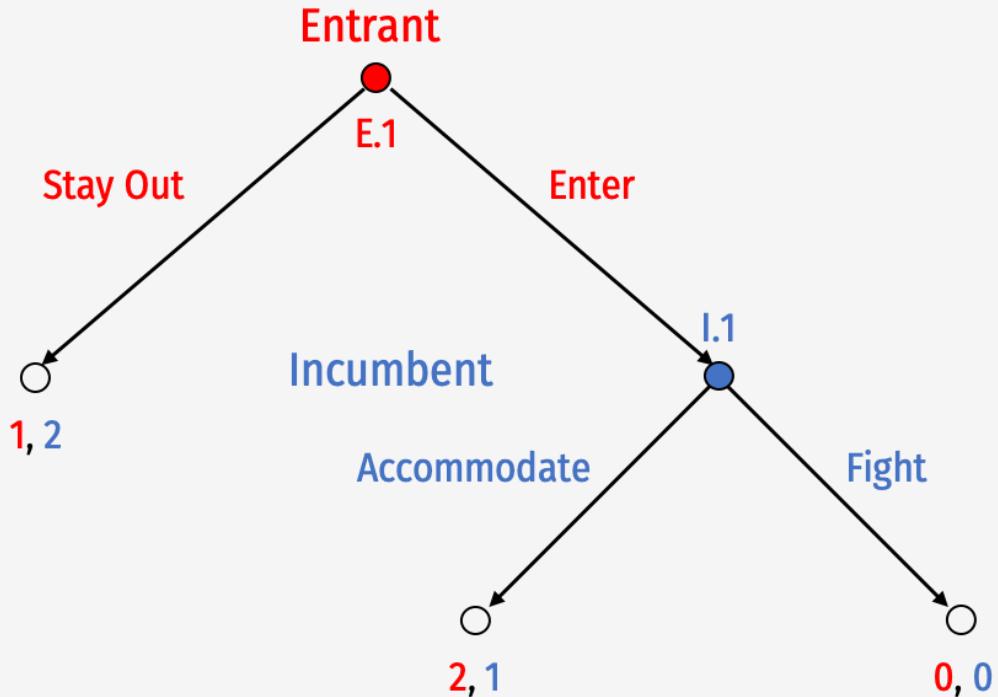
- Note **Incumbent**'s strategy only comes into play if **Entrant** plays **Enter** and the game reaches node I.1

# Solving a Sequential Game: Backward Induction



- **Backward induction:** to determine the outcome of the game, start with the *last-mover* (i.e. decision nodes just before terminal nodes) and work to the beginning
- A process of considering “**sequential rationality**”:

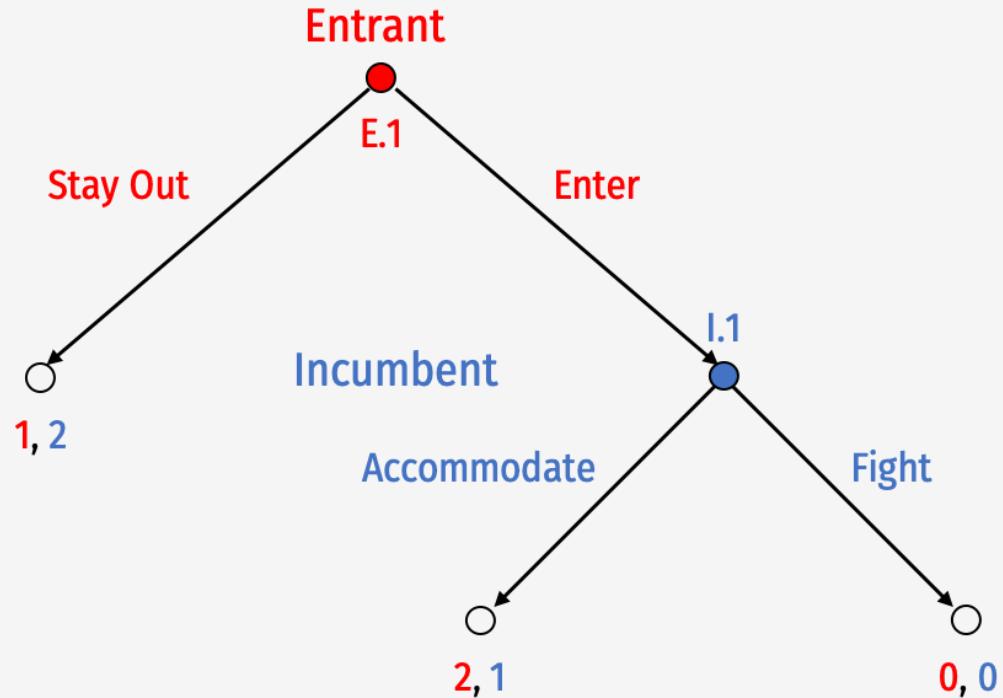
“If I play X, my opponent will respond with Y; given their response, do I really want to play X?”



# Solving a Sequential Game: Backward Induction



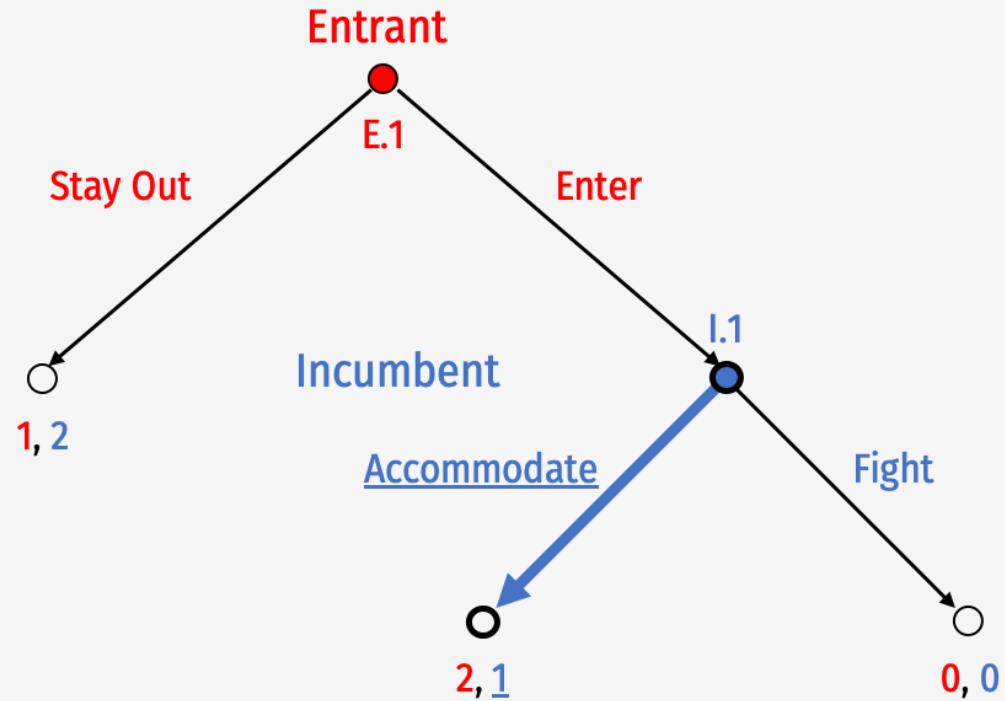
- We start at I.1 where **Incumbent** can:
  - Accommodate to earn 1
  - Fight to earn 0



# Solving a Sequential Game: Backward Induction



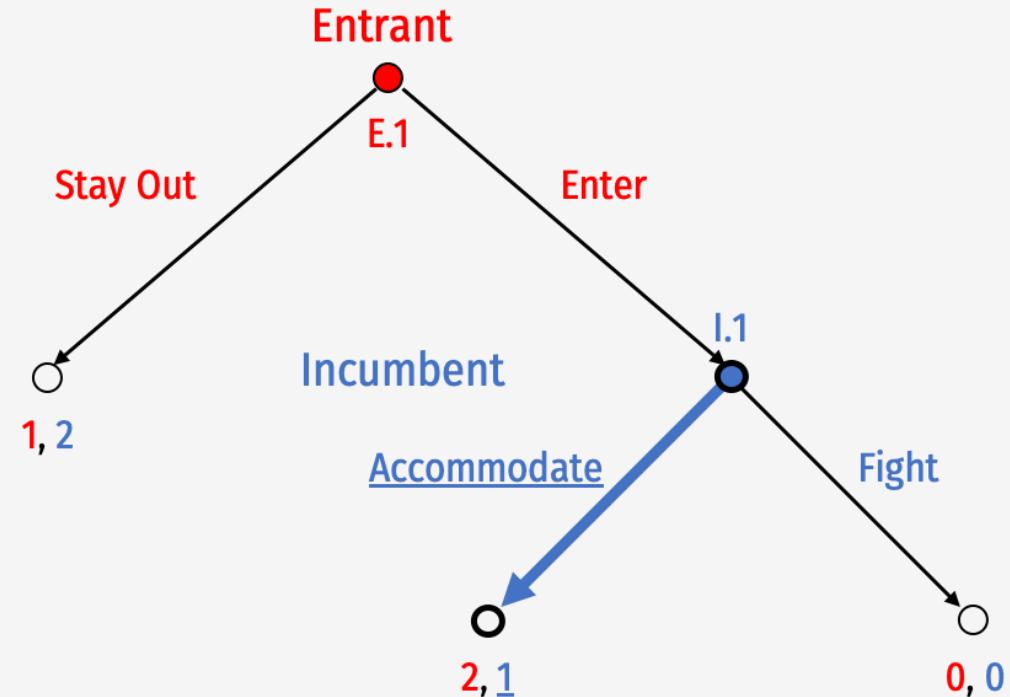
- Incumbent will Accommodate if game reaches I.1



# Solving a Sequential Game: Backward Induction



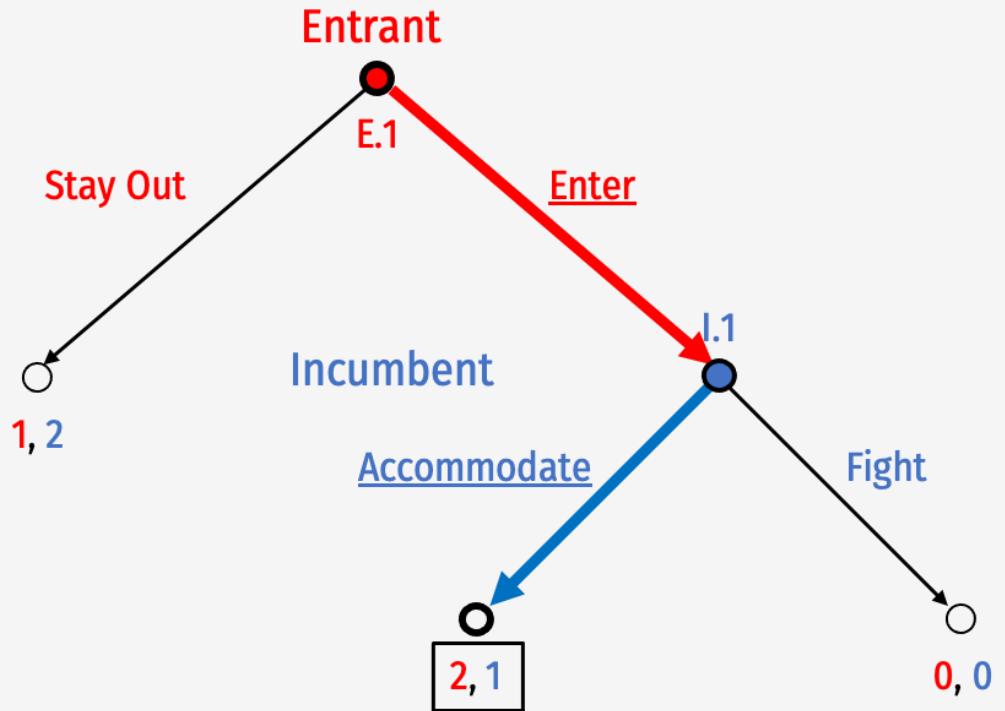
- **Incumbent** will **Accommodate** if game reaches **I.1**
- Given this, what will **Entrant** do at **E.1**?
  - **Stay Out** to earn **1**
  - **Enter**, knowing **Incumbent** will **Accommodate**, and so will earn **2**



# Solving a Sequential Game: Backward Induction



- Entrant will Enter at E.1
- Continue until we've reached the initial node (beginning)
- We have the outcome:  
**(Enter, Accommodate)**
- Some textbooks call this a “**rollback equilibrium**”
  - more technical name: **subgame perfect Nash equilibrium**



# Sequential Games: Normal vs. Extensive Form



- Any game in extensive form can also be depicted in “normal” or “strategic” form (a payoff matrix)
- Note, if **Entrant** plays **Stay Out**, doesn't matter what **Incumbent** plays, payoffs are the same
- Solve this for Nash Equilibria...

		Incumbent	
		Accommodate	Fight
Entrant	Enter	2	0
	Stay Out	1	0
Incumbent	Accommodate	1	2
	Fight	2	1

# Nash Equilibria



- Two Nash Equilibria:

1. (**Enter, Accommodate**)
2. (**Stay Out, Fight**)

- But remember, we ignored the *sequential* nature of this game in normal form

- Which Nash equilibrium is **sequentially rational?**

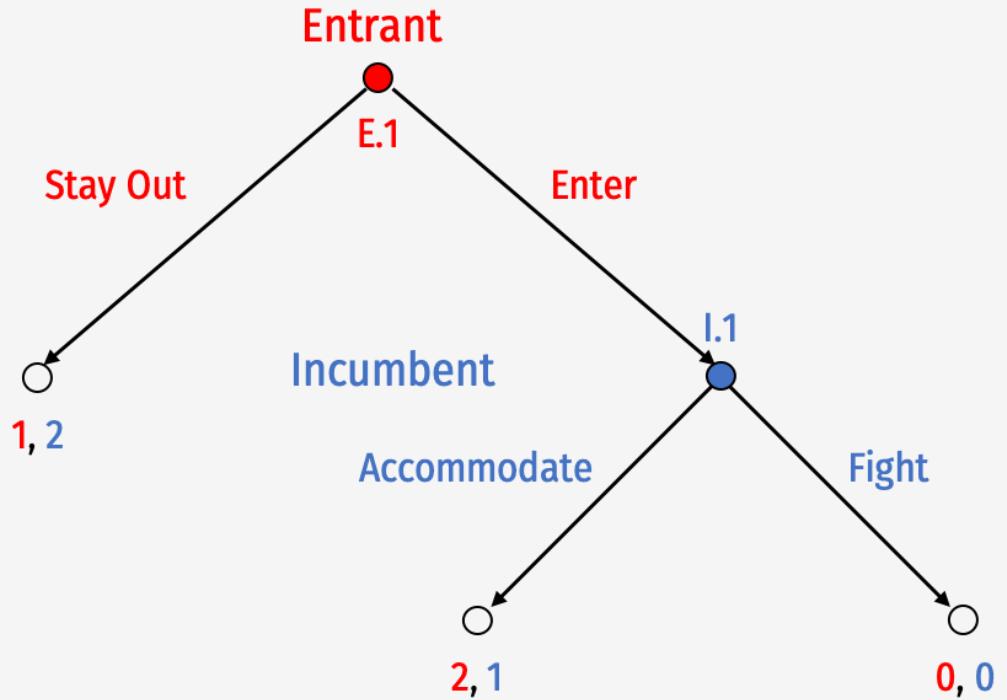
- New solution concept: **subgame perfect Nash equilibrium (SPNE)**

		Incumbent	
		Accommodate	Fight
Entrant	Enter	2	0
	Stay Out	1	0
Incumbent	Accommodate	1	2
	Fight	2	1

# Subgames



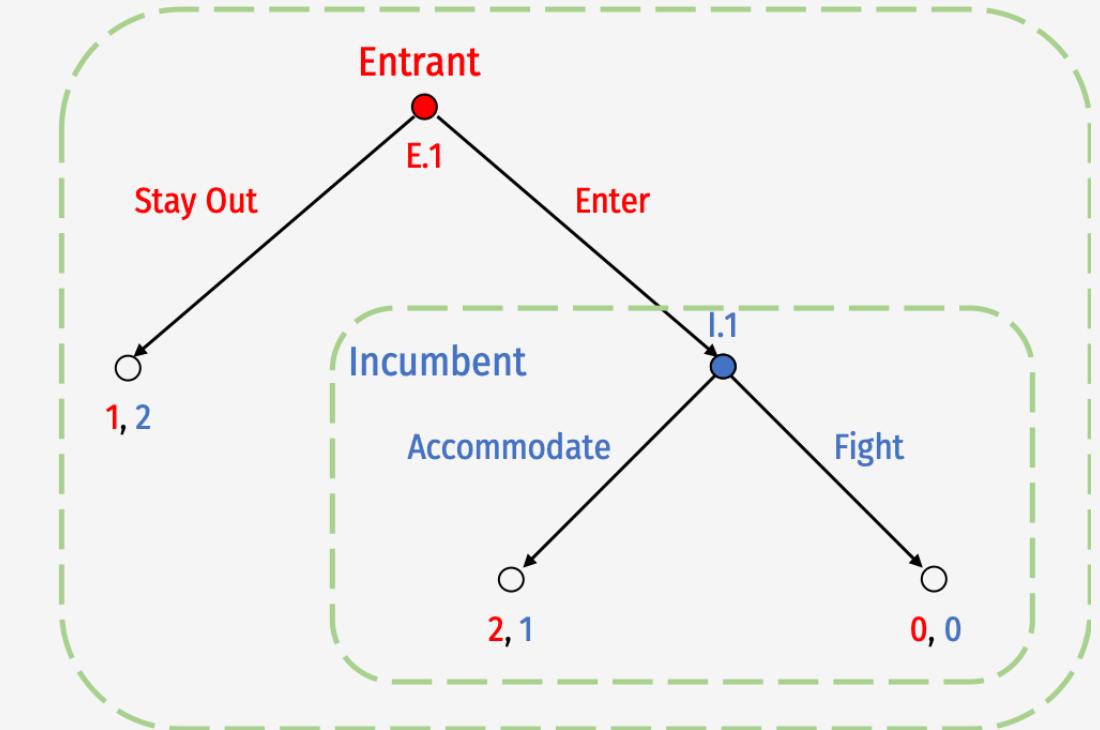
- **Subgame:** any portion of a full game beginning at one node and continuing until all terminal nodes
  - i.e. any decision node starts a subgame containing all the "branches" of that decision node
- Every full game is itself a subgame
- How many subgames does *this* game have?



# Subgames



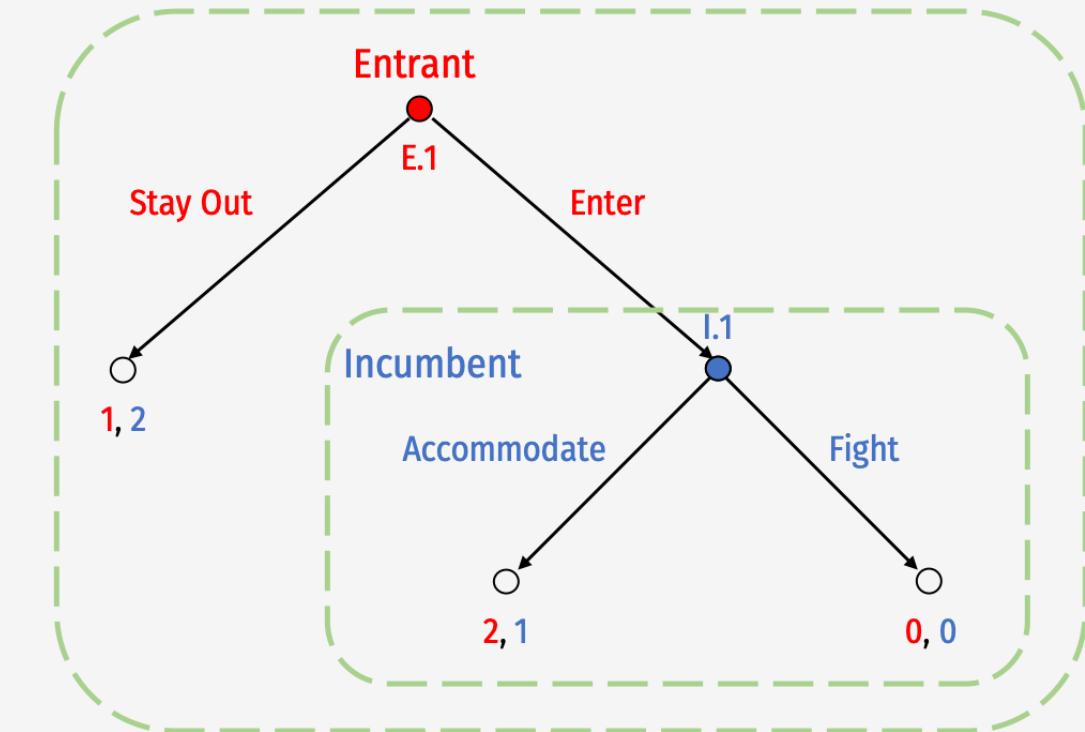
1. Subgame initiated at decision node **E.1**  
(i.e. the full game)
2. Subgame initiated at decision node **I.1**



# Subgame Perfect Nash Equilibrium



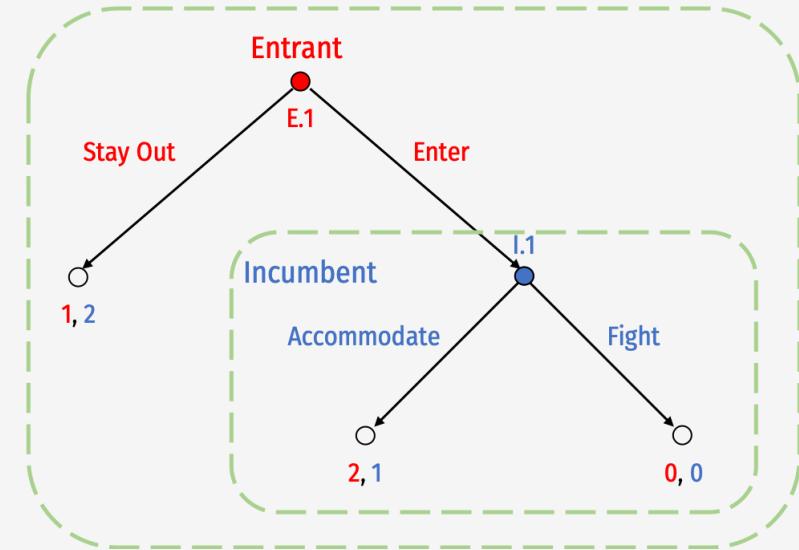
- Consider each subgame as a game itself and ignore the “**history**” of play that got a to that subgame
  - What is optimal to play in *that* subgame?
- Consider a set of strategies that is optimal for all players in *every* subgame it reaches
- That is a **subgame perfect Nash equilibrium**



# Subgame Perfect Nash Equilibrium



- Recall our two Nash Equilibria from normal form:
  - (Enter, Accommodate)
  - (Stay Out, Fight)

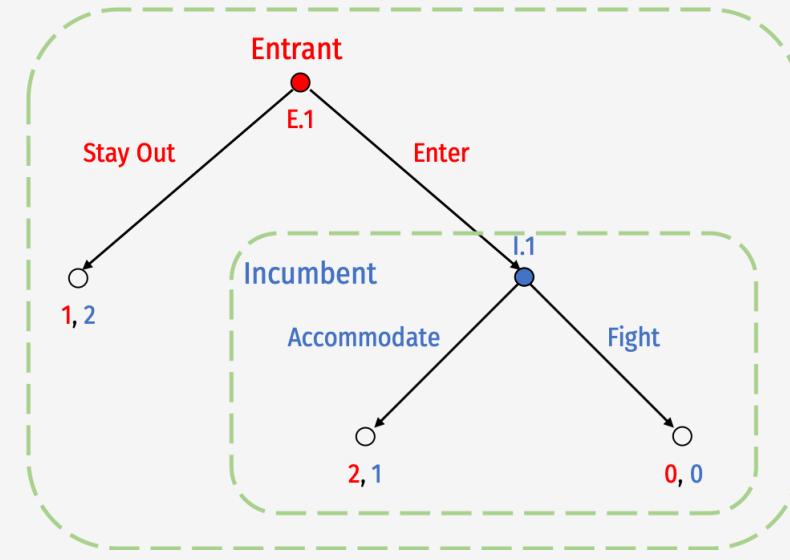


		Incumbent	
		Accommodate	Fight
Entrant	Enter	2	0
	Stay Out	1	1

# Subgame Perfect Nash Equilibrium



- Recall our two Nash Equilibria from normal form:
  1. (**Enter, Accommodate**)
  2. (**Stay Out, Fight**)
- Consider the second set of strategies, where **Incumbent** chooses to **Fight** at node **I.1**
- What if for some reason, **Incumbent** is playing this strategy, and **Entrant** unexpectedly plays **Enter**?

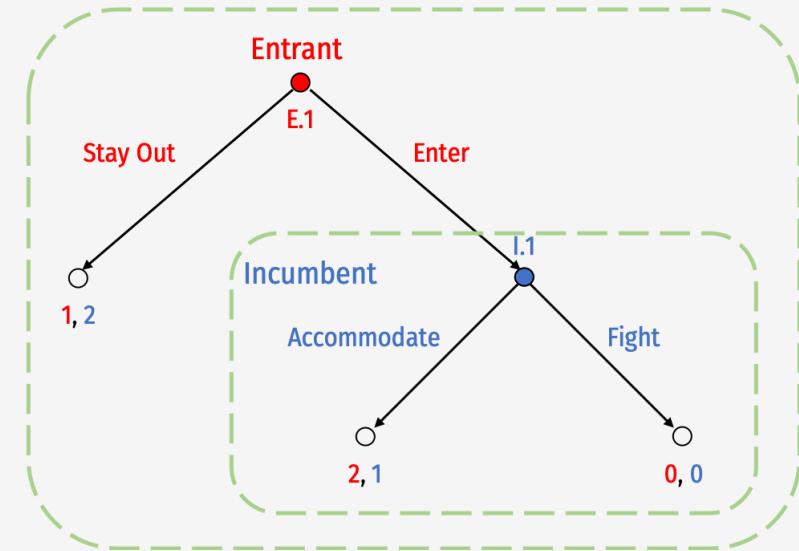


		Incumbent	
		Accommodate	Fight
Entrant	Enter	2	0
	Stay Out	1	0

# Subgame Perfect Nash Equilibrium



- It's **not rational** for **Incumbent** to play **Fight** if the game reaches **I.1!**
  - Would want to switch to **Accommodate!**
- **Incumbent** playing **Fight** at **I.1** is **not a Nash Equilibrium in this subgame!**
- Thus, Nash Equilibrium (**Stay Out**, **Fight**) is **not sequentially rational**
  - It *is* still a Nash equilibrium!

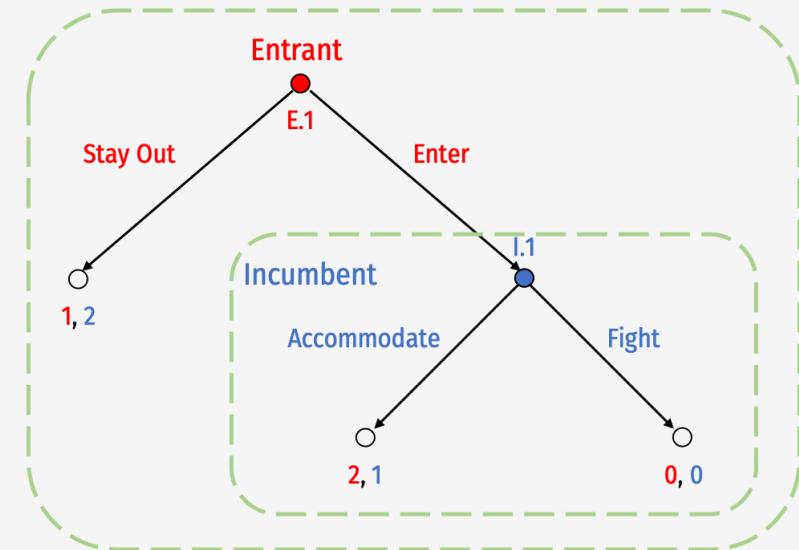


		Incumbent	
		Accommodate	Fight
Entrant	Enter	2	0
	Stay Out	1	0
Incumbent	Accommodate	2	1
	Fight	1	0

# Subgame Perfect Nash Equilibrium



- Only (**Enter, Accommodate**) is a **Subgame Perfect Nash Equilibrium (SPNE)**
- These strategy profiles for each player constitute a Nash equilibrium in every possible subgame!
- Simple connection: rollback equilibrium is always SPNE!

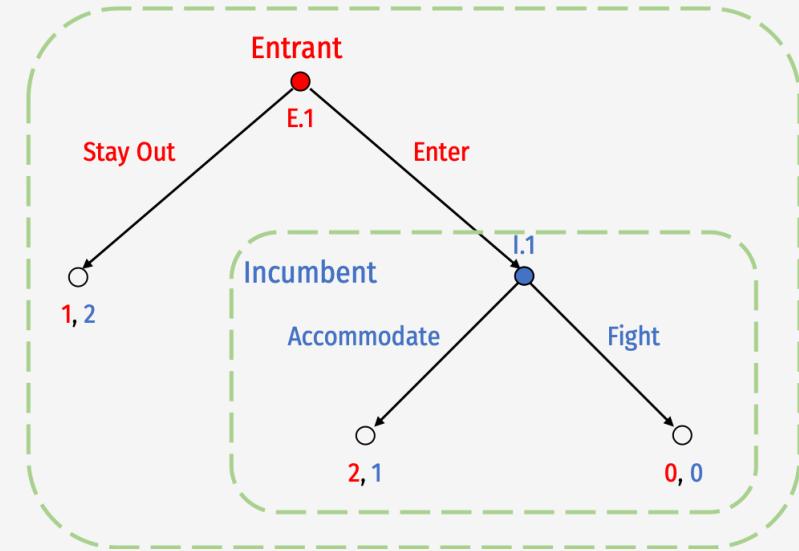


		Incumbent	
		Accommodate	Fight
		Enter	2
Entrant	Stay Out	1	0
	Enter	2	1

# SPNE and Credibility



- Suppose before the game started, **Incumbent** announced to **Entrant**  
“if you **Enter**, I will **Fight**!”
- This **threat** is **not credible** because playing **Fight** in response to **Enter** is not rational!
- The strategy is not Subgame Perfect!



		Incumbent	
		Accommodate	Fight
		Enter	2
		Accommodate	1
Entrant		Stay Out	1
		Accommodate	2
		Stay Out	2

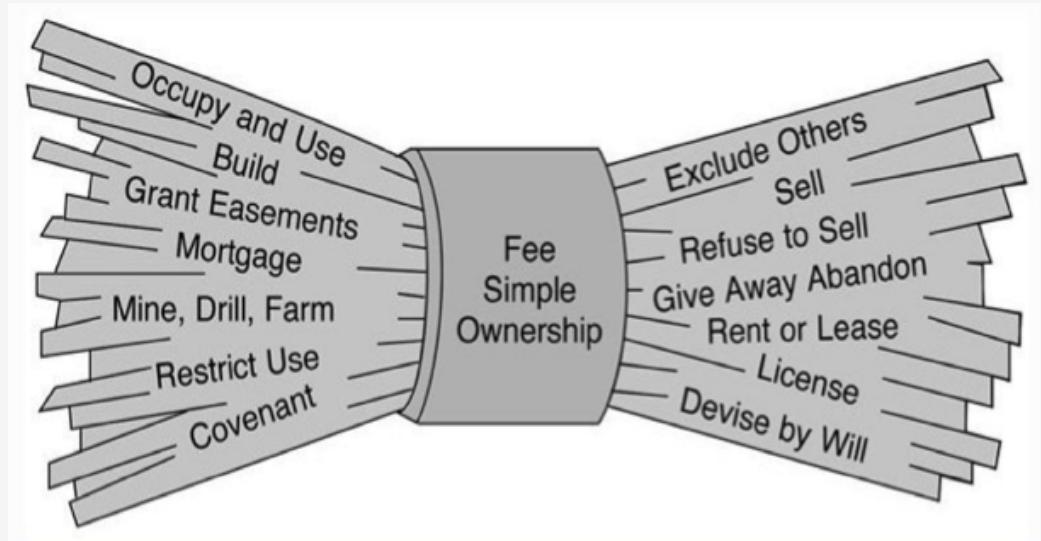


# The Problem With Ideas

# What Would an Efficient Property Law Look Like?



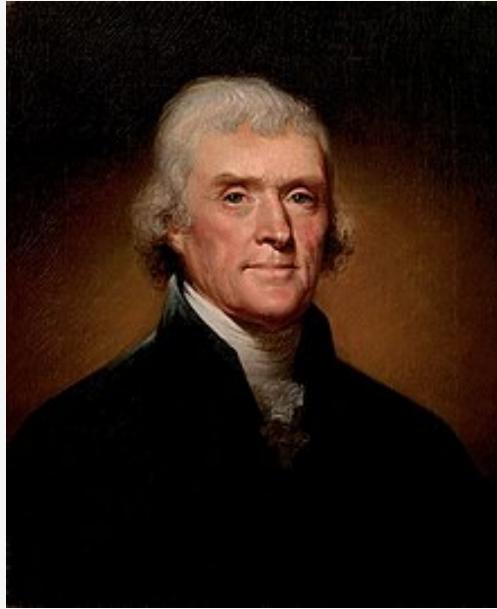
- Recall the 4 questions any property system must answer:
  1. **What can be privately owned?**
  2. What can (and can't) an owner do with her property?
  3. How are property rights established?
  4. What remedies are available when property rights are violated?



# The Economic *Problem* with Ideas I



# The Economic *Problem* with Ideas II



Thomas Jefferson  
(1743-1826)

"He who receives an idea from me, receives instruction himself without lessening mine; as he who lights his taper at mine, receives light without darkening me. That ideas should freely spread from one to another over the globe, for the moral and mutual instruction of man, and improvement of his condition, seems to have been peculiarly and benevolently designed by nature, when she made them, like fire, expansible over all space, without lessening their density in any point, and like the air in which we breathe, move, and have our physical being, incapable of confinement or exclusive appropriation."

# High Fixed Costs, Low Marginal Costs I



# High Fixed Costs, Low Marginal Costs II



washingtonpost.com

The Washington Post  
Democracy Dies in Darkness

Sign In

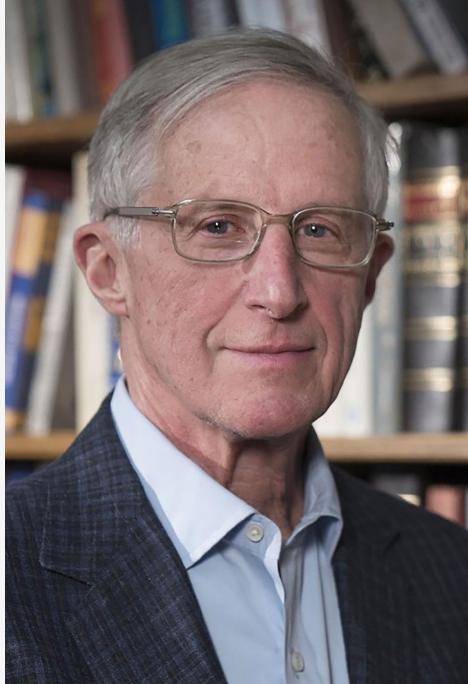
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Morning Mix

‘Game of Thrones’ was pirated more than a billion times – far more than it was watched legally

Source: [Washington Post \(Sept 8, 2017\)](#)

# Positive Spillovers



"We conclude that [about 2.2%] of the social returns from technological advances over the 1948-2001 period was captured by producers, indicating that most of the benefits of technological change are passed on to consumers rather than captured by producers," (p.1)

Nordhaus, William, 2004, ["Schumpeterian Profits in the American Economy: Theory and Measurement," NBER Working Paper 10433](#)

William Nordhaus

(1941-)

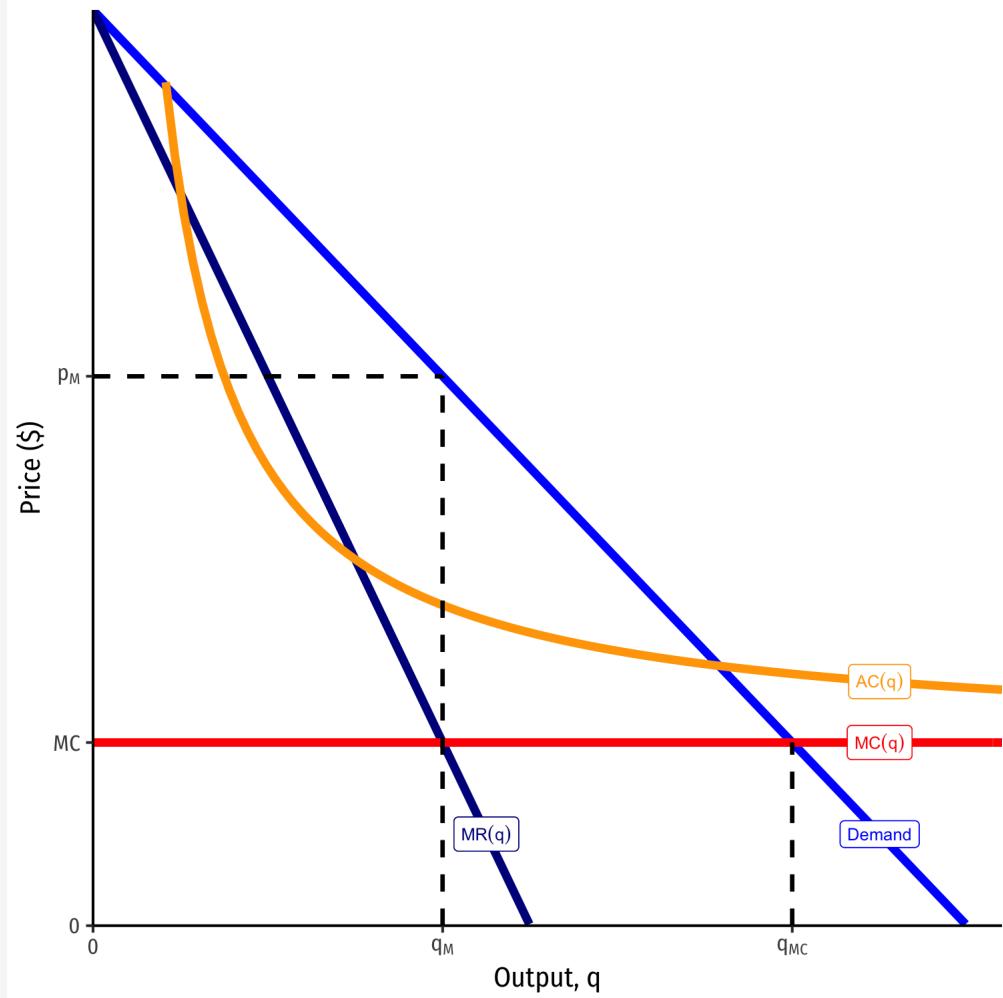
Economics Nobel 2018

# The Economic Problem With Information



- Information is very costly to generate, very easy to disseminate/imitate
- High fixed costs  $f$ , constant low/zero marginal costs  $c$ 
  - Implies **economies of scale**, falling average costs

$$AC(q) = \frac{f}{q} + c$$



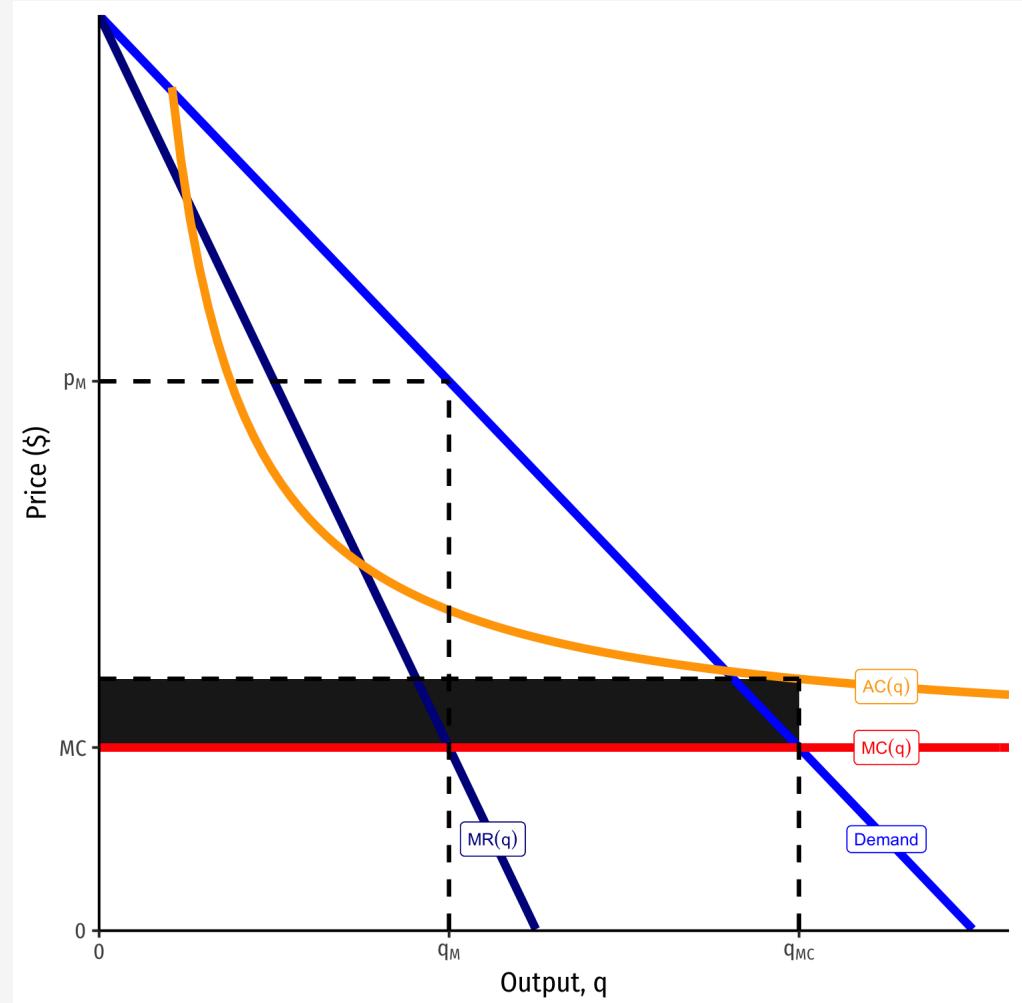
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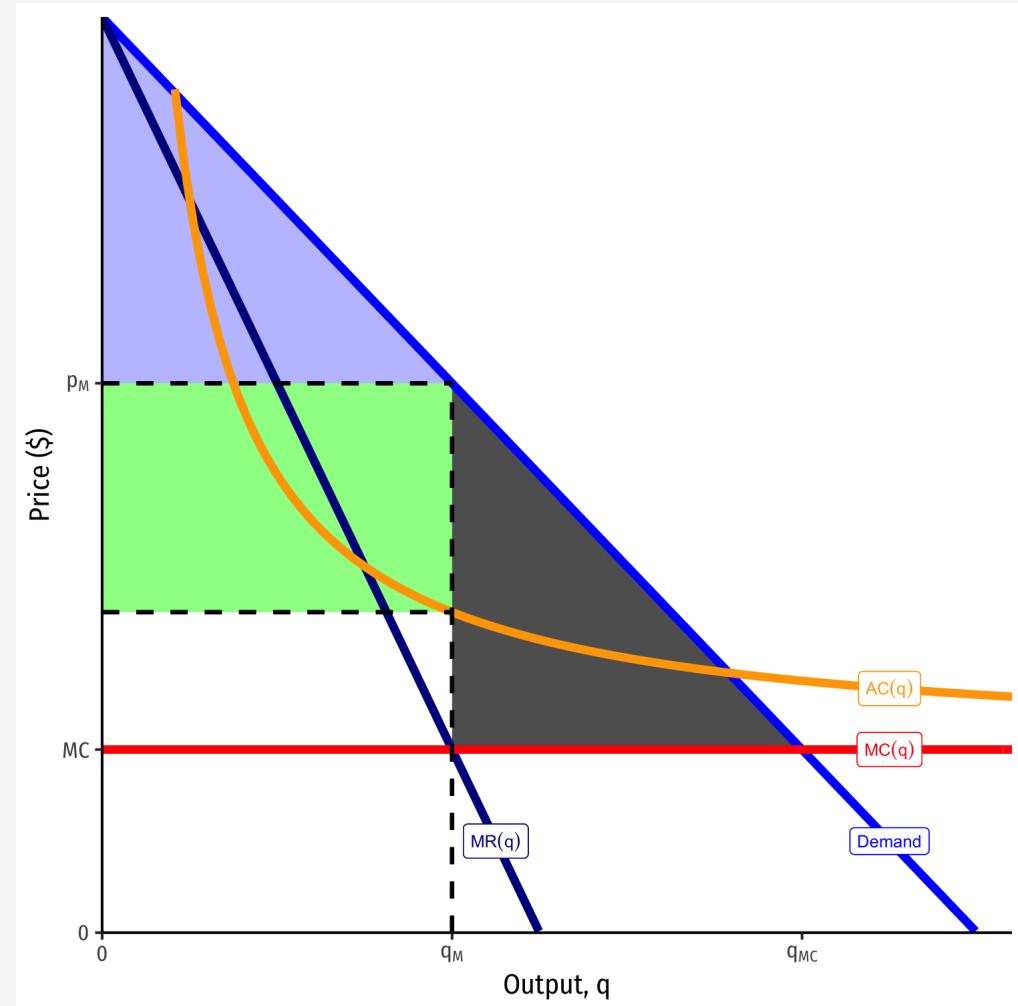
- $AC(q) > MC(q)$  always
  - Socially-efficient **marginal cost pricing is not profitable**
  - Producing  $q_c$  where  $p = MC$ , is below  $AC(q)$



# The Economic Problem With Information



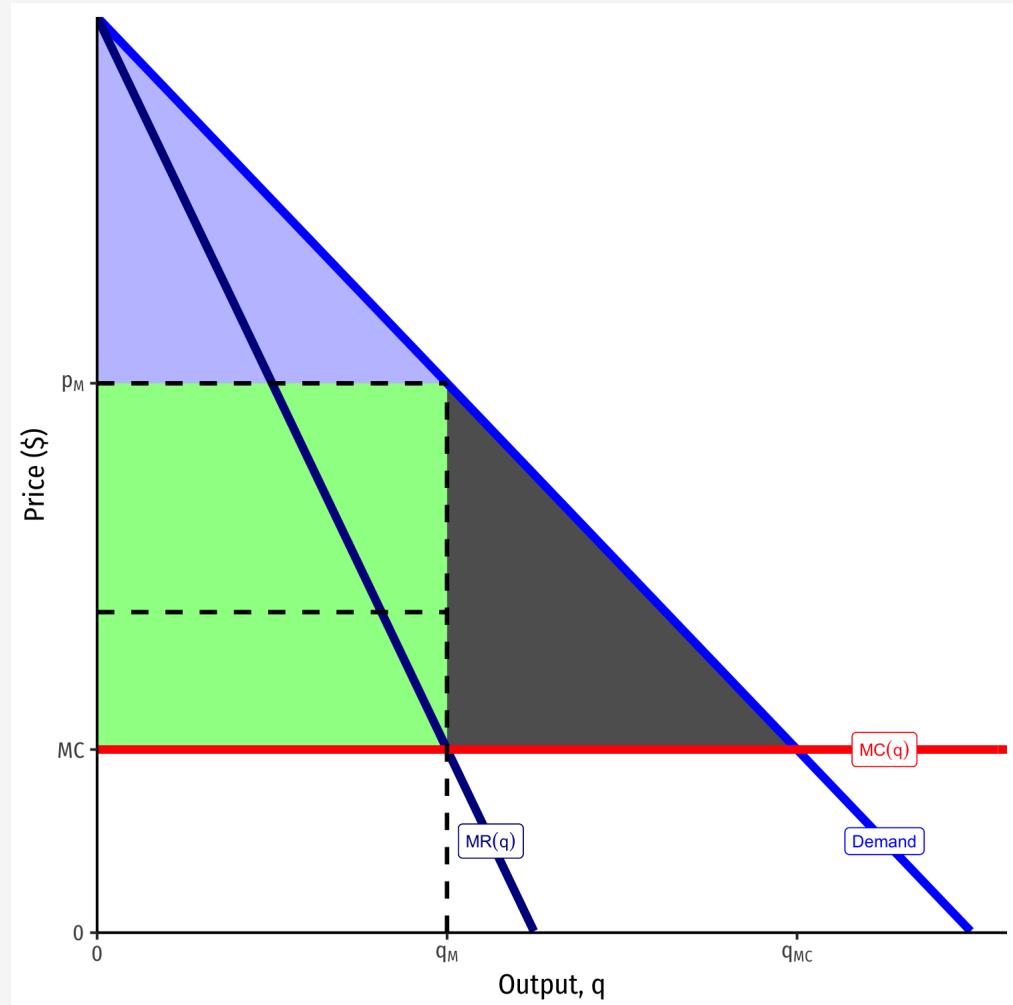
- If left to own devices, acts like a monopoly
- Creates inefficiency
  - Restrict output to  $q_M$  where  $MR(q) = MC(q)$
  - Mark up price to consumers' max WTP at  $p_M$
  - Small **consumer surplus**
  - Generates **DWL**



# The Economic Problem With Information



- But now consider a **second firm**, with same  $MC(q) = c$  but **no fixed costs**  $f$ !
  - Doesn't have to invest in R&D, just copy the first firm!
- If by itself, could maximize profits at  $p_m$ 
  - But so long as it can charge  $p < AC(q)$  of the first firm, can capture the market and push the first firm out of business



# A Game-Theoretic Example



**Example:** Suppose a company discovers a new drug.

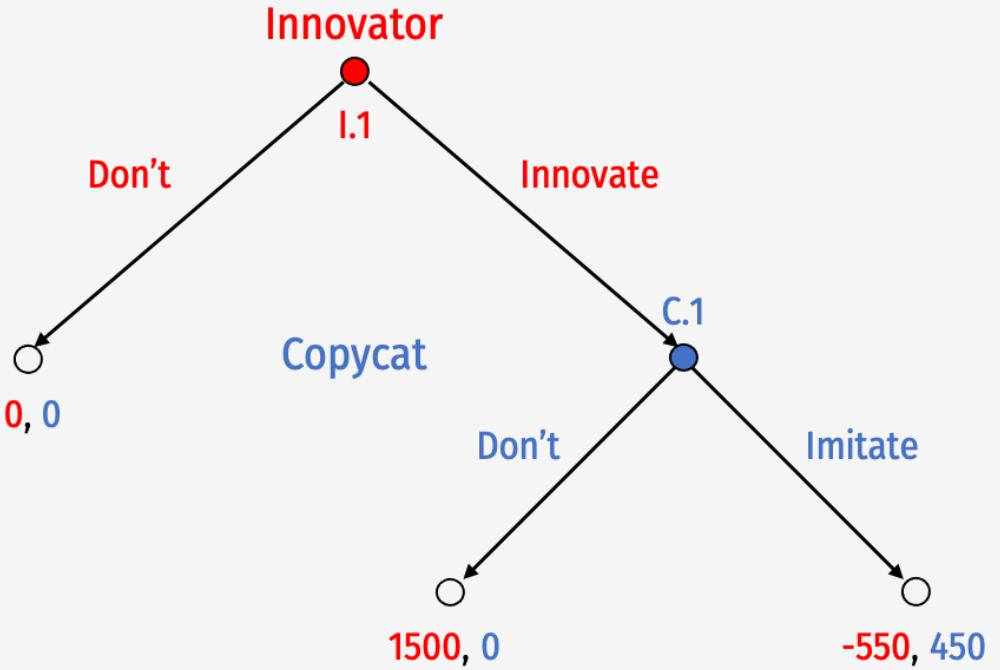
- Fixed costs of \$1,000 for R&D
- Monopoly profits of \$2,500
- Second firm can imitate for free, duopoly profits would be \$450 each

# A Game-Theoretic Example



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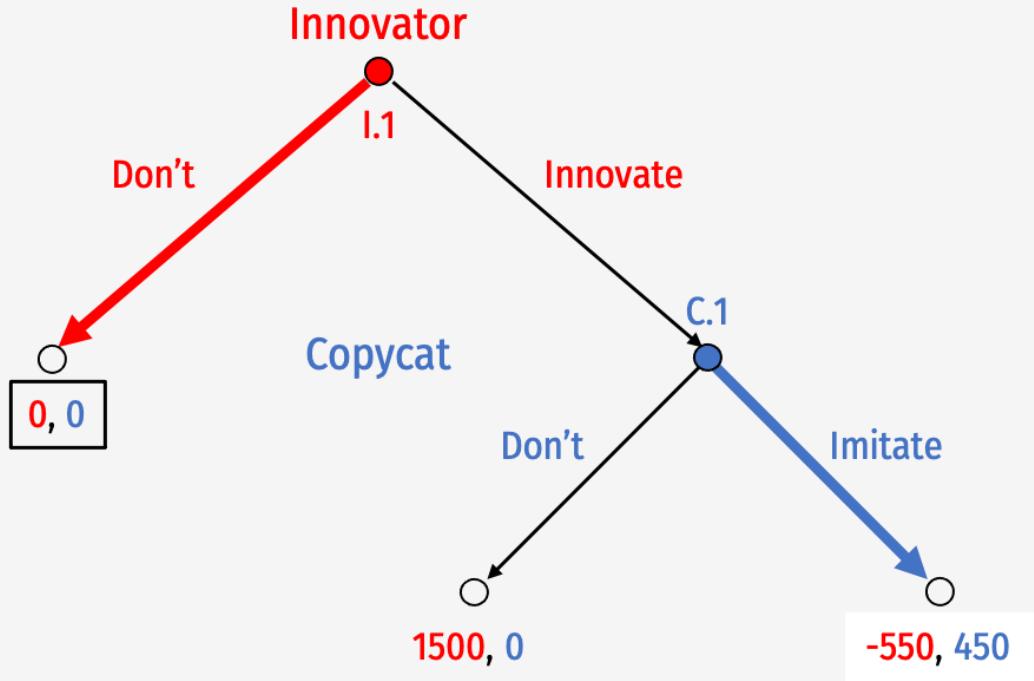


# A Game-Theoretic Example



**Example:** Suppose a company discovers a new drug.

- **SPNE:** {**Don't, Imitate**}
  - Lose valuable innovation
- Note: **Copycat** could *promise* not to **Imitate**, but it would not be a **credible** promise!

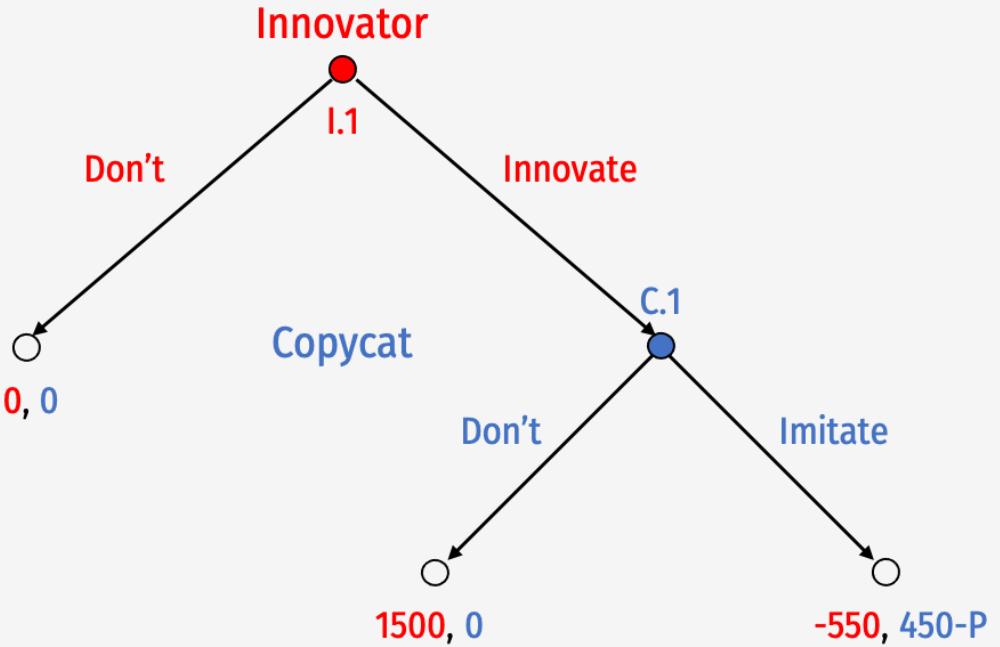


# A Game-Theoretic Example



**Example:** Suppose a company discovers a new drug.

- Suppose instead, **Innovator** can obtain a **patent** and sue **Copycat** (whether for damages or injunction) for **infringement**
  - **Copycat** would suffer some penalty P

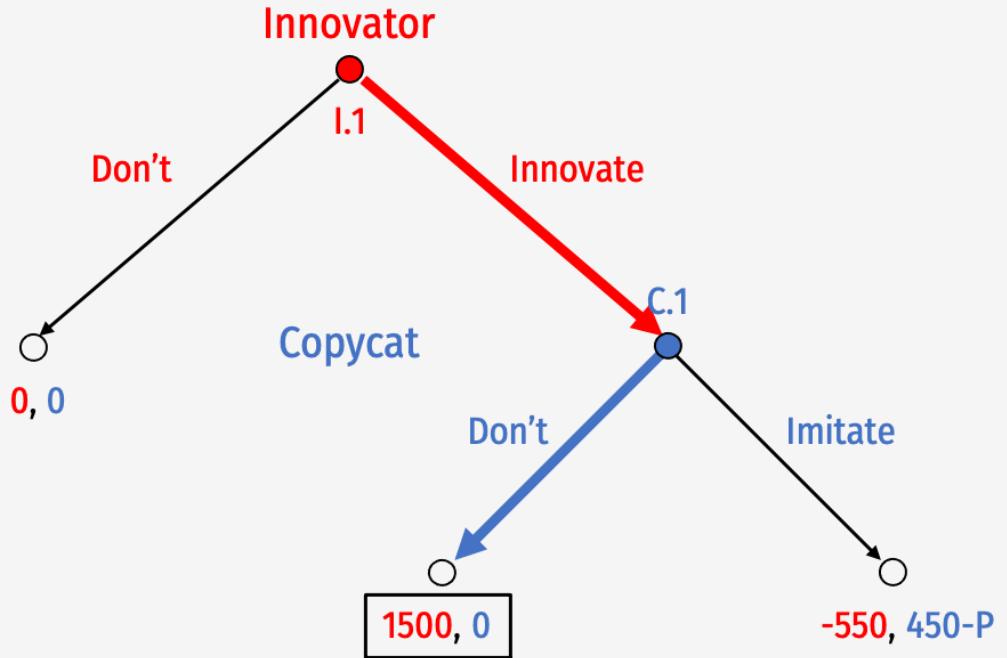


# A Game-Theoretic Example



**Example:** Suppose a company discovers a new drug.

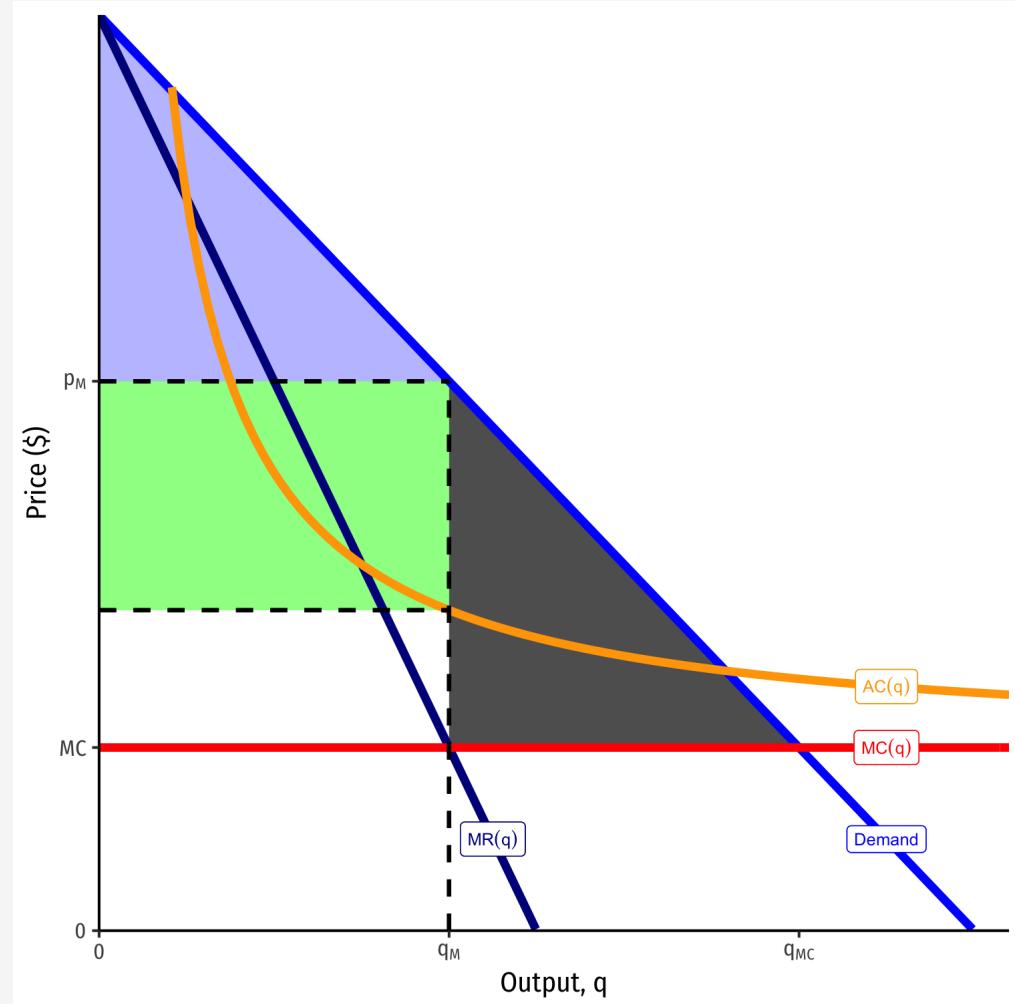
- Suppose instead, **Innovator** can obtain a **patent** and sue **Copycat** (whether for damages or injunction) for **infringement**
  - **Copycat** would suffer some penalty  $P$
- If  $P > 450$ , **Copycat** chooses **Don't**



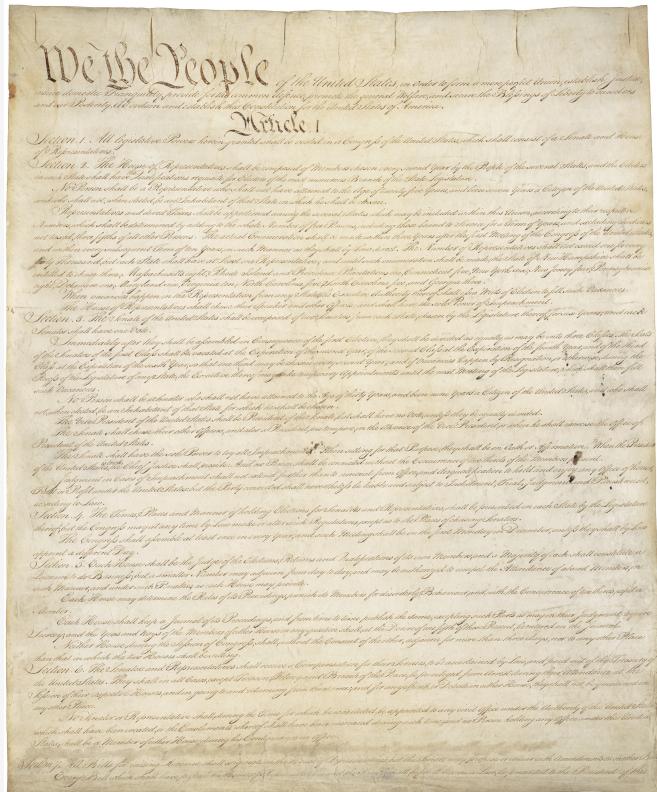
# The Economic Problem With Information



- But now we're back to the outcome where the **Innovator** becomes a **monopoly!**
- We're trading off one inefficiency for another
  - Without patents: no innovation
  - With patents: monopoly



# The Purpose of Intellectual Property



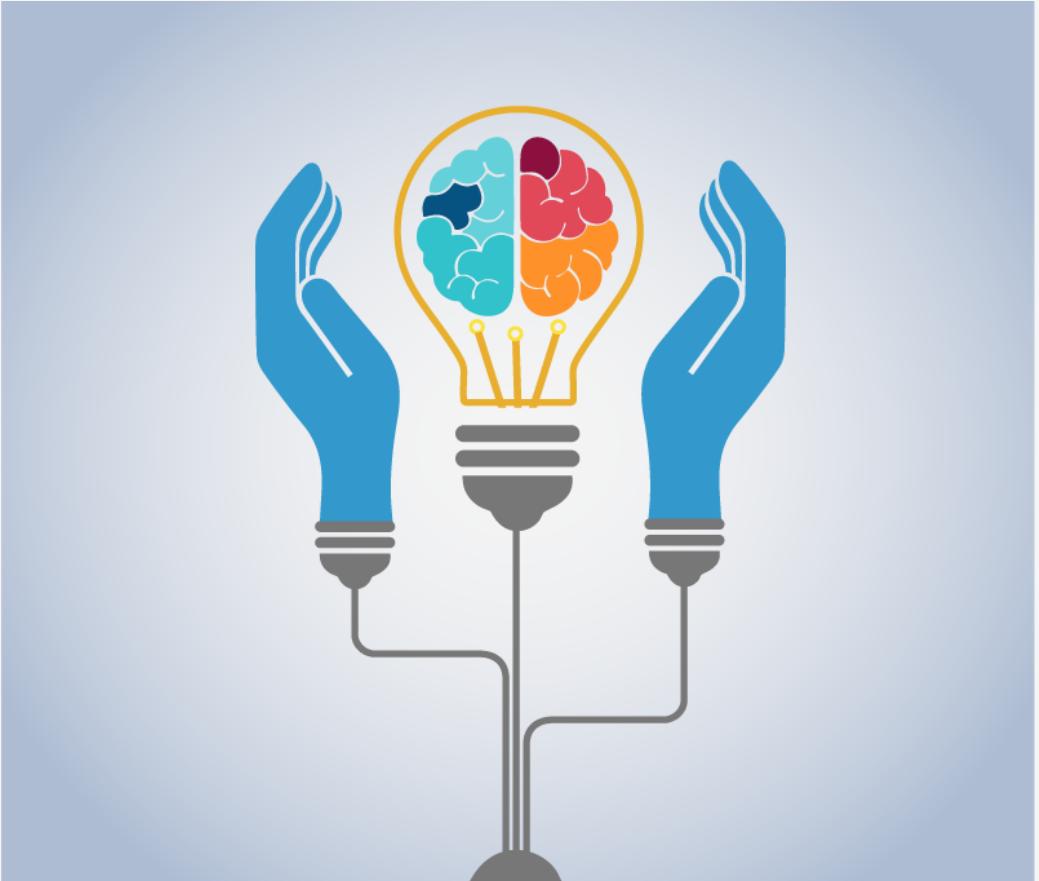
“The Congress shall have Power..To promote the Progress of Science and useful Arts, by securing for limited Times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries.”

United States Constitution, Article I, § 8, Clause 8

# Intellectual Property



- **Intellectual property (IP)**: ways that individual/s (or firm) can claim ownership of **information**
- **Patents** over products, commercial processes
- **Copyrights** over expressions
- **Trademarks** over brand names, logos
- **Trade secrets**





# Patents

# Patents



- **Patent** grants the holder the **exclusive rights** to prevent others from producing and selling a product for a limited time

# Patents: Rights



- **Patent** grants the holder

“the right to exclude others from making, using, offering for sale, or selling the invention throughout the U.S. or importing the invention into the U.S”

- Lasts only for a limited time
  - 20 years from date of application
  - Optional 20 year renewal

# Patents: Acquisition



- Apply to government **Patent and Trademark Office (PTO)**
- For application to be approved, invention must be:
  1. **Novel**
  2. **Non-obvious**
  3. Have **practical utility**

[35 U.S.C. \(\\\$\) 101-103](#)

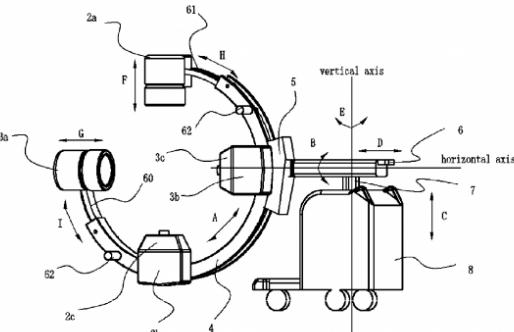


# Patents and the Public Domain



- Patent requires detailed instructions and figures for how to produce the product
- Upon expiration, invention enters the **public domain**, where all at liberty to use
- Cannot patent “laws of nature, natural phenomena, and abstract ideas”

(12) <b>United States Patent</b> Zhang et al.	(10) <b>Patent No.:</b> US 8,992,082 B2 (45) <b>Date of Patent:</b> Mar. 31, 2015
(54) <b>G-ARM X-RAY IMAGING APPARATUS</b>	(56) <b>References Cited</b>
(71) <b>Applicants:</b> Jun Zhang, Needham, MA (US); Liu Cao, Needham, MA (US); Shiyu Wei, Needham, MA (US); Sean Zhu, Needham, MA (US)	<b>U.S. PATENT DOCUMENTS</b>
(72) <b>Inventors:</b> Jun Zhang, Needham, MA (US); Liu Cao, Needham, MA (US); Shiyu Wei, Needham, MA (US); Sean Zhu, Needham, MA (US)	3,549,885 A 1/2/1970 Joenloesping et al. 4,884,293 A 11/1989 Yamashita 5,095,501 A 3/1992 Kobayashi 5,515,416 A 5/1996 Szczek et al. 5,923,721 A 7/1999 Duscheck 6,047,826 A 8/2000 Grady et al. 6,113,264 A 9/2000 Watanabe 6,364,526 B2 4/2002 Ivan et al. 6,789,941 B2 9/2004 Grady 7,394,751 B2 9/2009 Grebner et al.
(* ) <b>Notice:</b> Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 52 days.	<b>Primary Examiner —</b> Courtney Thomas <b>(74) Attorney, Agent, or Firm —</b> David J. Connaughton, Jr.; Gary E. Lambert; Lambert & Associates
(21) <b>Appl. No.:</b> 13/953,776	(57) <b>ABSTRACT</b>
(22) <b>Filed:</b> Jul. 30, 2013	An X-ray imaging apparatus is provided having advantages of both C-shaped, G-shaped, and ring-shaped arm configurations. The device consists of a gantry that supports X-ray imaging machinery. The gantry is fixed to support bi-planar X-rays to be taken simultaneously or without movement of the equipment and/or patient. The gantry is adjustable to change angles of the X-ray imaging machinery. Further, in some embodiments, the X-ray receptor portion of the X-ray imaging machinery may be positioned on retractable and extendable arms, allowing the apparatus to have a larger access opening when not in operation, but to still provide bi-planar X-ray ability when in operation.
(65) <b>Prior Publication Data</b> US 2015/0036799 A1 Feb. 5, 2015	<b>20 Claims, 8 Drawing Sheets</b>
(51) <b>Int. Cl.</b> <i>H05G 1/02</i> (2006.01) <i>A61B 6/00</i> (2006.01)	
(52) <b>U.S. Cl.</b> <i>C22E 1/00</i> ..... <i>A61B 6/4429</i> (2013.01) <i>USPC</i> ..... <i>378/197</i>	
(58) <b>Field of Classification Search</b> <i>CPC</i> ..... <i>H05G 1/02; A61B 6/4441; A61B 6/4405; A61B 6/4429</i> <i>USPC</i> ..... <i>378/193-198</i> See application file for complete search history.	



# Patents



- Patents are property rights
  - Can be sold or gifted to others
  - Can be **licensed** to others (others can produce/sell/use product in exchange for a **royalty** fee)
  - Holder can choose *not* to exercise rights
- Use/sale of product without consent of patent-holder constitutes **infringement**
  - Patent-holder can sue for **damages** & **injunction** against future use



# History of Patents

- “Letters Patent” by English Crown (esp. 17<sup>th</sup> C.–18<sup>th</sup> C.)
- 1623 Statute of Monopolies
- Patent Act of 1790 (U.S.)



# Issues With Patents: The PTO



- Patents are managed by government bureaucrats
  - Underpaid, overworked
  - Lot of bad patents getting through



# Issues With Patents: The PTO



US006004596A

**United States Patent [19]**

Kretchman et al.

[11] Patent Number: **6,004,596**[45] Date of Patent: **Dec. 21, 1999**

[54] SEALED CRUSTLESS SANDWICH

5,853,778 12/1998 Mayfield ..... 426/89

[75] Inventors: Len C. Kretchman, Fergus Falls, Minn.; David Geske, Fargo, N. Dak.

## OTHER PUBLICATIONS

[73] Assignee: Menusaver, Inc., Orrville, Ohio

"50 Great Sandwiches", Carole Handslip, pp. 81-84,86,95, 1994.

[21] Appl. No.: **08/986,581**

Primary Examiner—Lien Tran

[22] Filed: **Dec. 8, 1997**

Attorney, Agent, or Firm—Vickers, Daniels &amp; Young

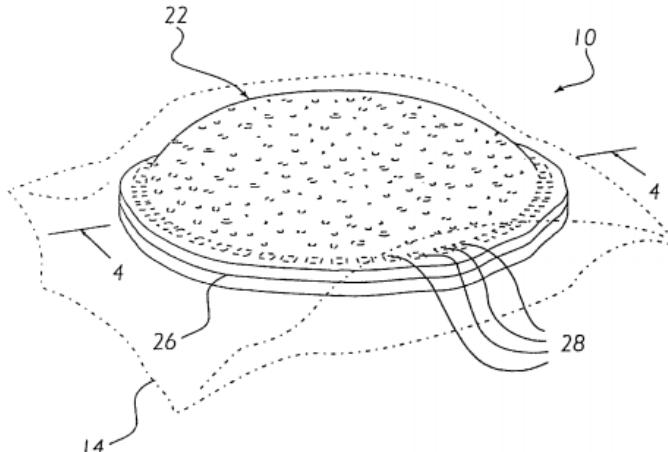
[51] Int. Cl.<sup>6</sup> ..... **A21D 13/00**  
[52] U.S. Cl. ..... 426/94; 426/274; 426/275;  
426/297[58] Field of Search ..... 426/94, 274, 275,  
426/297, 138

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10 Claims, 4 Drawing Sheets



US005443036A

**United States Patent [19]**

Amiss et al.

[11] Patent Number: **5,443,036**[45] Date of Patent: **Aug. 22, 1995**

## [54] METHOD OF EXERCISING A CAT

[76] Inventors: Kevin T. Amiss, 255 S. Pickett St., #301, Alexandria, Va. 22304; Martin H. Abbott, 10549 Assembly Dr., Fairfax, Va. 22030

[21] Appl. No. **144,473**[22] Filed: **Nov. 2, 1993**[51] Int. Cl.<sup>6</sup> ..... **A01K 29/00**[52] U.S. Cl. ..... **119/707**

[58] Field of Search ..... 119/702, 707, 174, 905;

446/485

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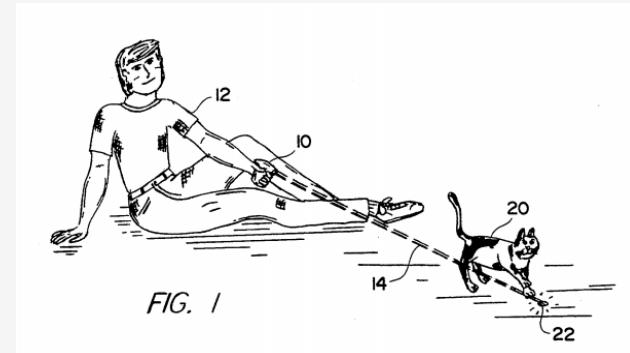
Carayan et al., "Effects of tianeptine on the Performance of a reaching movement in a cat", *Psychopharmacology*, vol. 104, Issue 3, Berlin, 1991, pp. 328-336.Levesque et al., "Visual 'cortical-recipient' and tectal-recepient pointing zones play distinct roles in cat visuomotor performance", *Behavioral Brain Research*, vol. 39, Netherlands, 1990, pp. 157-166.

Primary Examiner—Todd E. Manahan

## [57] ABSTRACT

A method for inducing cats to exercise consists of directing a beam of invisible light produced by a handheld laser apparatus onto the floor or wall or other opaque surface in the vicinity of the cat, then moving the laser so as to cause the bright pattern of light to move in an irregular way fascinating to cats, and to any other animal with a chase instinct.

4 Claims, 1 Drawing Sheet



# Issues With Patents: Breadth



**Example:** Consider two similar, but distinct inventions



# Issues With Patents: Breadth



**Example:** Consider two similar, but distinct inventions



- If patent breadth is **narrow**, each be able to patent our own invention, regardless of who invented first
  - Focus on quality, price, better product vs competition

# Issues With Patents: Breadth



**Example:** Consider two similar, but distinct inventions

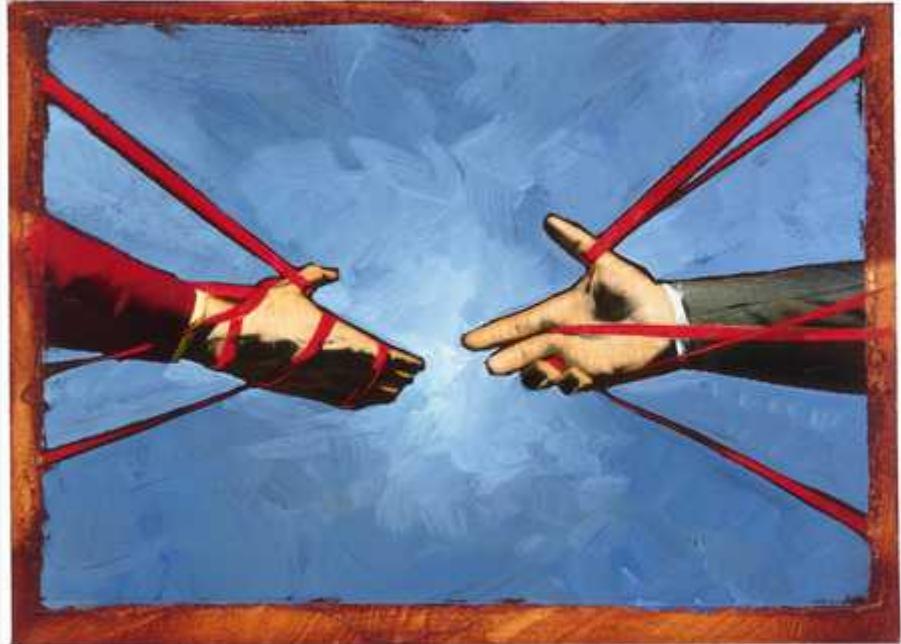


- If patent breadth is **narrow**, each be able to patent our own invention, regardless of who invented first
  - Focus on quality, price, better product vs competition
- If patent breadth is **narrow**, first filer will be able to block the second producer

# Issues With Patents: Litigation and “Weak Patents”



- Individuals have been allowed to patent a wide variety of things, often extremely broad and vague
  - **“Weak” patents**: many of these would not hold up in court
  - But requires **going to court** to determine; the average patent lawsuit *costs* \$2-5 million
- Raises transaction costs of production
  - Some products, especially in tech sector, touch upon hundreds of patents!
  - Industry-based solutions: patent pools, cross-licensing agreements



# Issues With Patents: Submarine Patents & Patent Trolls



- **Submarine patent:** individual takes out a patent on something extremely broad, doesn't enforce it for many years ("stays under the surface"), until a producer comes along (thinking the idea is not patented)
- **Non-practicing entity (NPE) aka Patent troll:** buys up patents not with intention to produce anything, but only to sue individuals and firms for infringement



# Issues With Patents: Submarine Patents & Patent Trolls



# Issues With Patents: Submarine Patents & Patent Trolls



# Tragedy of the Anticommons



- **Tragedy of the anti-commons:** too many holders of right to exclude others, blocks productive action
  - Symmetric to tragedy of the commons (not enough holders of right to exclude others)!





# Copyright

# Copyright



- **Copyright** grants the holder the **exclusive rights** to prevent others from publishing and selling a particular expressive work for a limited time



# Copyright: Rights



- **Copyright** grants the holder

“the exclusive rights to reproduce the [work]...to prepare derivative works...to distribute to the public by sale or other transfer of ownership, or by rental, lease, or lending,...to perform,...to display publicly”



# Copyright: Acquisition



- Since the Copyright Act of 1976, copyright is **automatic**

“in original works of authorship fixed in any tangible medium of expression, now known or later developed”

- Applies to “literary works, musical works, dramatic works, choreographs, pictorial, graphic, and sculptural works, motion pictures, sound recordings, and architecture”



# Copyright: Duration



- Copyright lasts for  
  
“a term consisting of the life of the author and 70 years after the author’s death.”
- Afterwards, works enter the **public domain** where all are at liberty to use



[17 U.S.C. \(\\\$\) 302](#)

# Copyrights



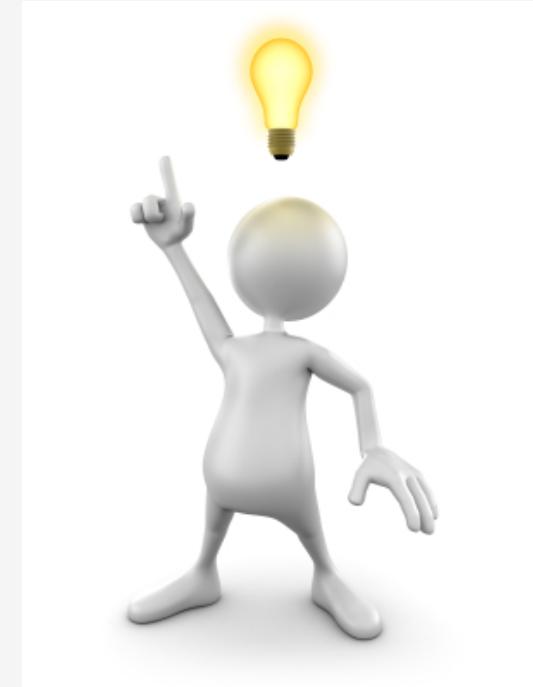
- Copyrights are property rights
  - Can be sold or gifted to others
  - Can be **licensed** to others (others can produce/sell/use product in exchange for a **royalty** fee)
  - Holder can choose *not* to exercise rights
- Use/sale of product without consent of copyright-holder constitutes **infringement**
  - Copyright-holder can sue for **damages** & **injunction** against future use



# Copyright vs. Patents



- **Idea-expression dichotomy:** copyright scope is limited to the particular **expressions**, not to the **ideas** themselves
  - patents cover *ideas per se*
  - *Baker v Selden* (1879) – can you copyright an accounting system? (no, just a book explaining it)
- e.g. for an adventure novel/movie
  - Can copyright characters, text, scenes, artwork, film, etc.
  - Can't copyright the general *idea* of the plot (“boy meets girl” or “the hero's journey”)



# Copyrights and Fair Use



- One legal defense against infringement  
(unique to copyright): “**fair use**”

“for purposes such as criticism,  
comment, news reporting, teaching  
(including multiple copies for  
classroom use), scholarship, or  
research”

Fair Use

# Copyrights: History



- Stationers' Company since 1557 – London publishers guild & censorship
  - monopoly over all publishing
  - created their own private “copy right”
- English Civil Wars (1630s–1660s)
  - Censorship, abuses by Crown & Parliament
  - Spurned origins of freedom of speech, freedom of press, habeas corpus
- 1710 Statute of Anne creates statutory copyright
  - 1774 *Donaldson v. Beckett*, replaced Stationers' “copy right”



The Stationers' Company

# Copyright: History



- Copyright Act of 1790 creates federal copyright in U.S.
  - Covers “books, maps, and charts”
  - 14 year terms, with optional 14 year renewal
  - authors must both register & declare on their works if they want copyright protection
- Almost verbatim 1710 Statute of Anne



# Copyright: History



- 1790–1891 U.S. did not recognize copyrights to foreign authors
- U.S. publishing industry largely pirated famous British authors
  - Set up “courtesy of the trade” system of voluntary norms to avoid tragedy of commons
  - Created pseudo-property rights in foreign authors works
  - Ended up paying authors despite no obligation to, nor any legal protection earned

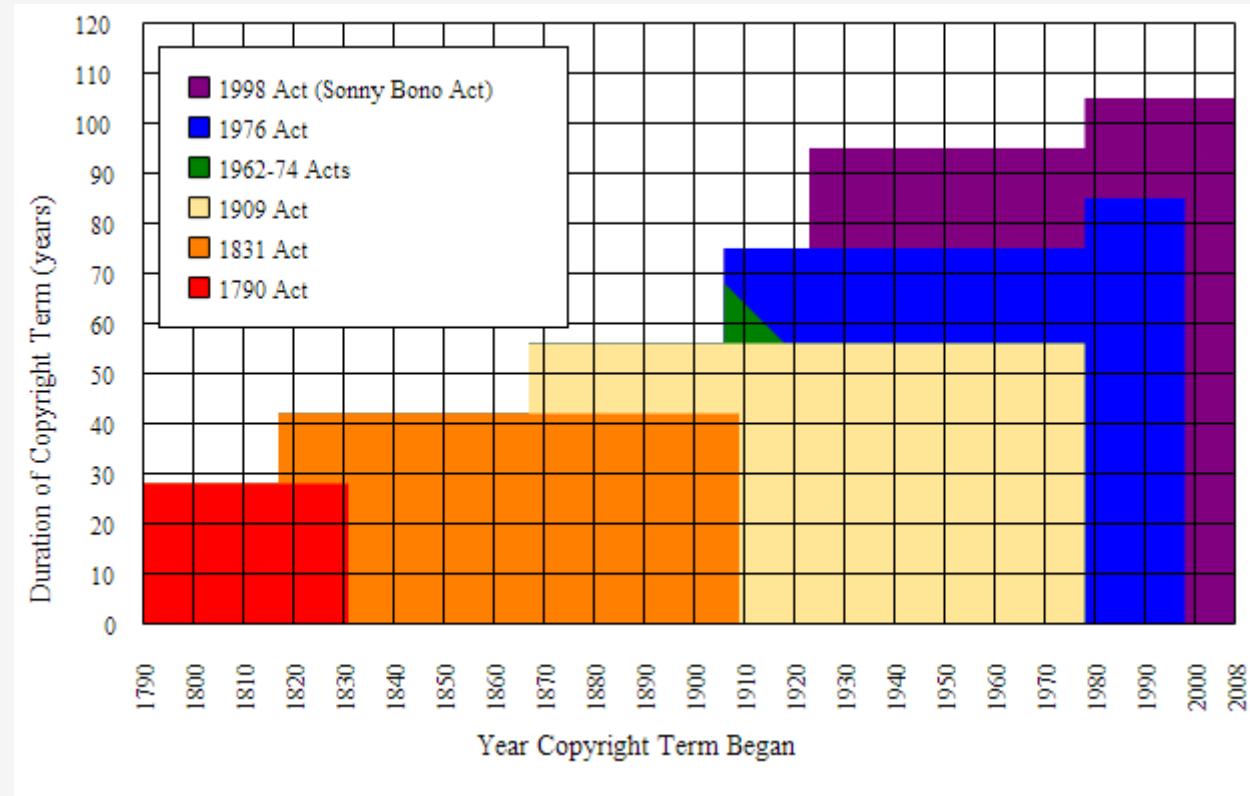


# Copyright Challenges: Derivatives



- Copyright-holders have rights over **derivative works**
- But most media (books, music, films) need to borrow from originals!

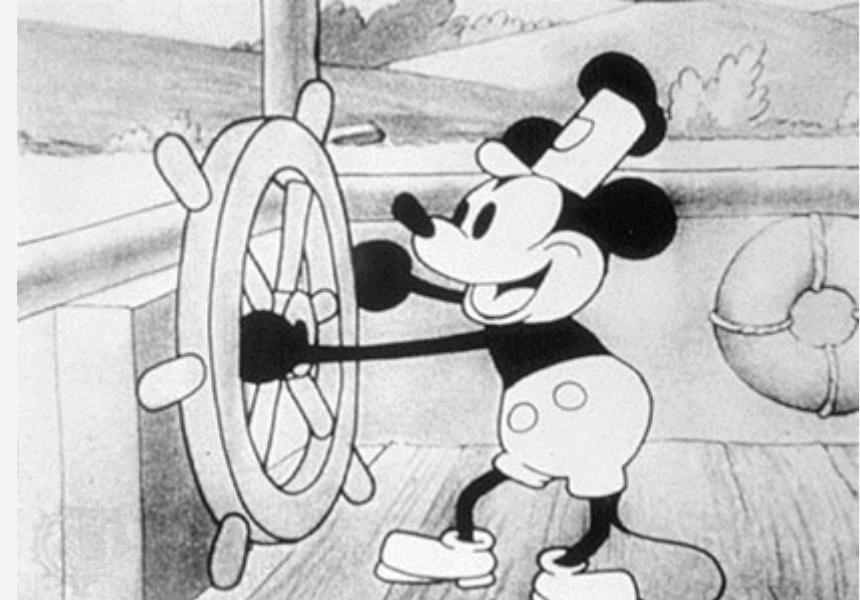
# Copyright Challenges: “Limited” Duration



# Copyright Challenges: “Limited” Duration + Rent-Seeking



- **Copyright Term Extension Act (CTEA)** of 1998 aka the **“Sonny Bono Act”** extended copyright from author’s life + 50 years to (current) author’s life + 70 years
- More controversially, it *retroactively* extended this duration to works about to expire in 1998
  - **“The Mickey Mouse Protection Act”**
  - Enormous lobbying by Disney



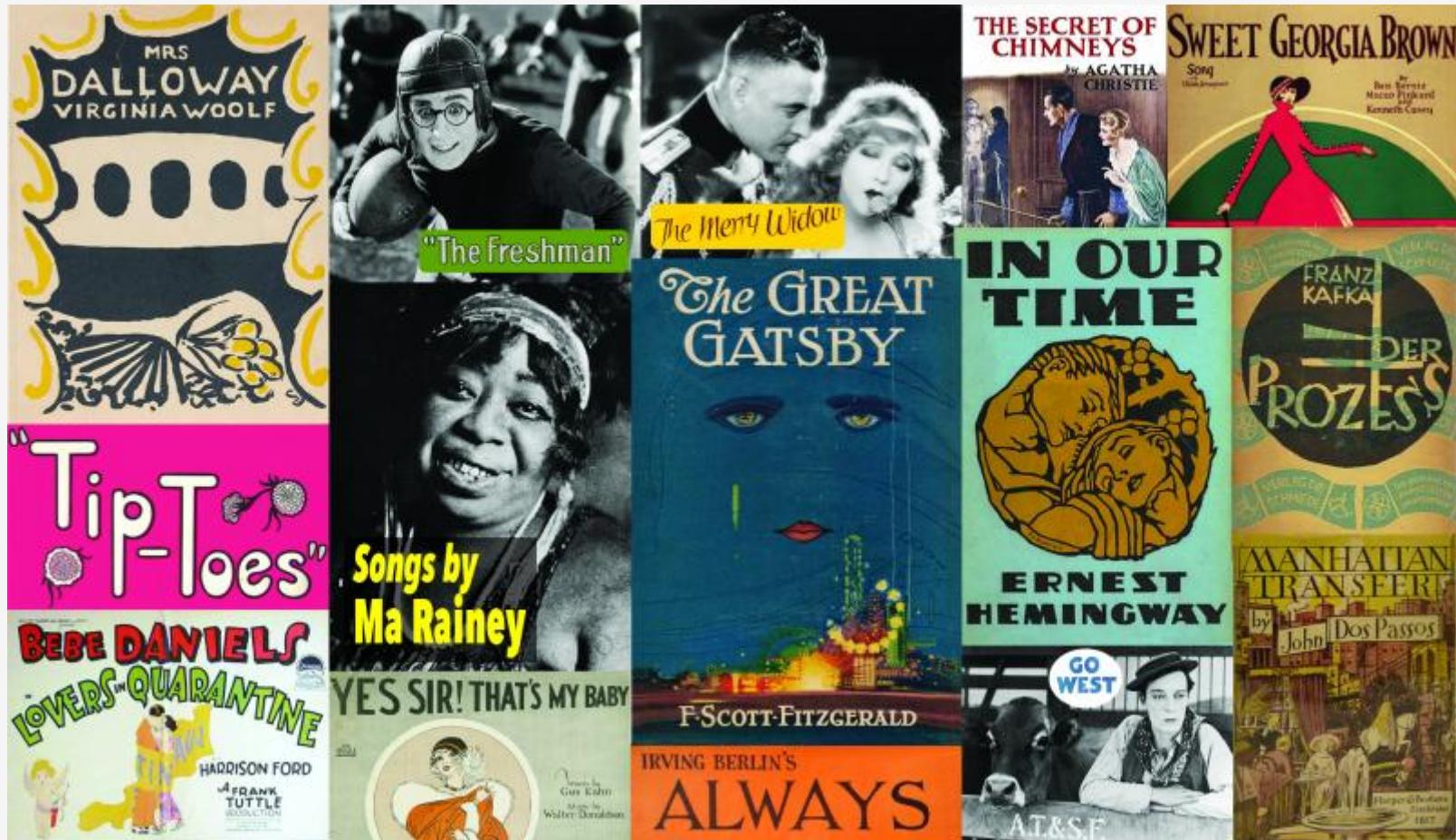
# Copyright Challenges: “Limited” Duration



- 2003 *Eldred v. Ashcroft*
  - Eldred sued U.S., claiming the 1998 Sunny Bono Act makes copyright no longer a reasonable “limited time”
- Amicus brief by 17 top economists (5 Nobel prize winners, including Coase!) agreed
  - Argued that the expected value of extending existing copyrights decades into future is very small, but increase in transaction costs is very large
- U.S. Supreme Court (7-2) upheld law



# Copyright Challenges: “Limited” Duration

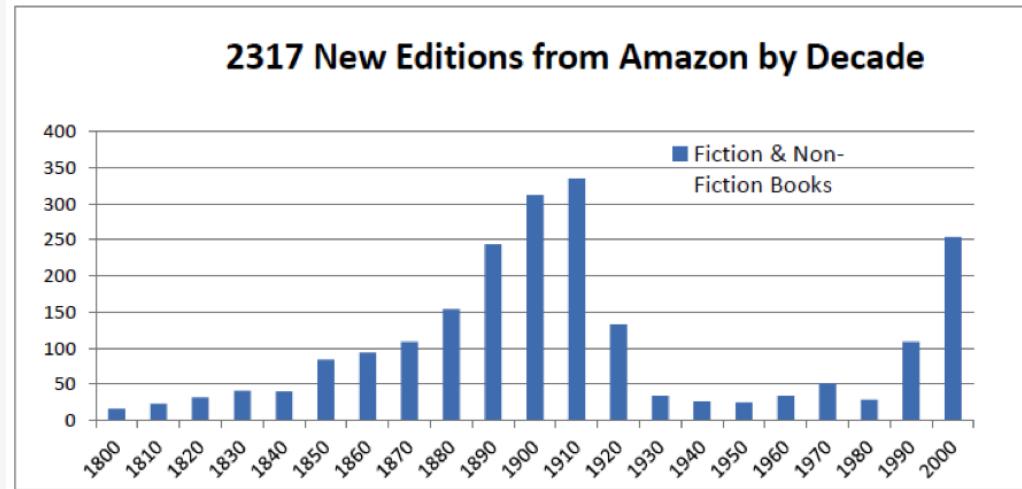


Works from 1925 that entered the public domain in 2021, [Center for the Study of Public Domain](#)

# Copyright Challenges: Orphan Works



- **Orphan works:** many works are out of print, but still technically copyrighted, nobody knows who the owner is (and too afraid to publish)
- Music, movies, and books produced in 1923-1946 (first 23 years affected by Sunny Bono Act), <6% available today



# Copyright Challenges: Over-criminalization



- No Electronic Theft (NET) Act (1997):  
infringing copyright even if for purposes  
other than commercial resale is illegal
- Digital Millennium Copyright Act (DMCA)  
(1998):
  - §512 Safe Harboring Provisions: any  
website-owner can avoid liability for  
users uploading infringing content by  
automatically removing the material  
("DMCA Takedown Notices")
  - §1201 Anti-Circumvention Provisions:  
manufacturing or using any device that

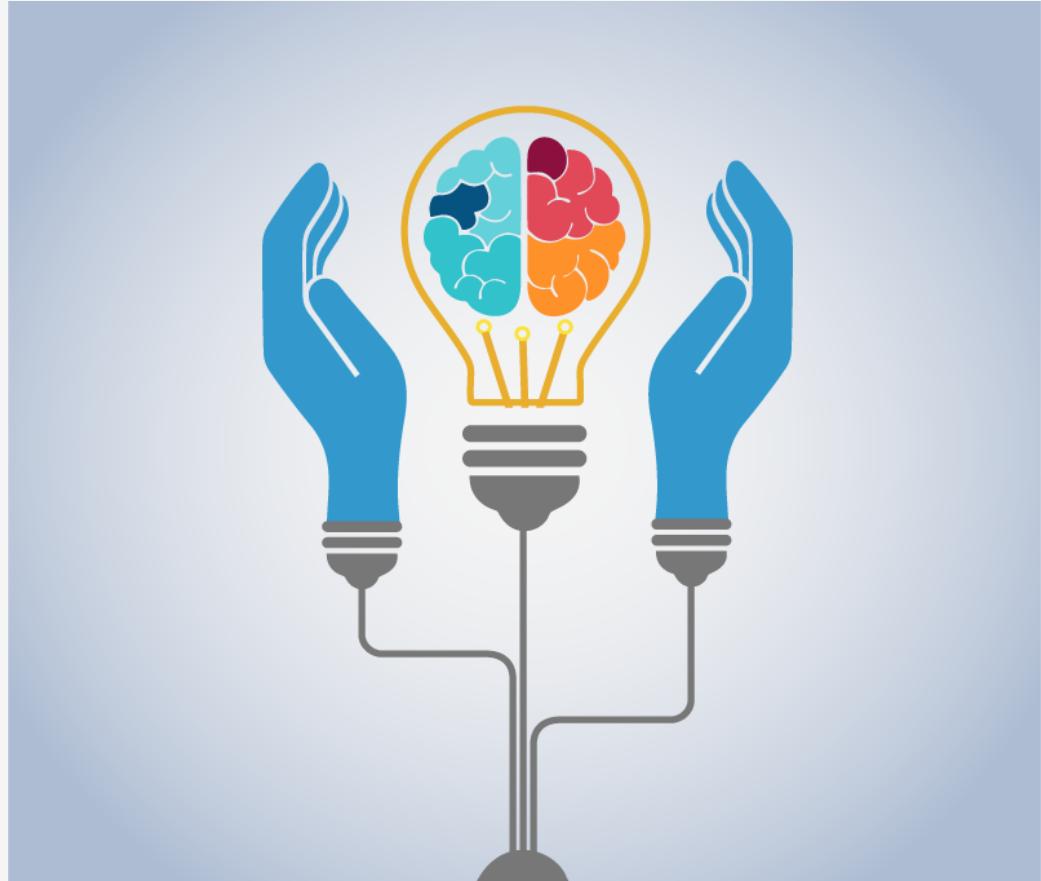


# Interlude: Intellectual *Property Rights*?

# Interlude: Is IP Property? Should it Be?



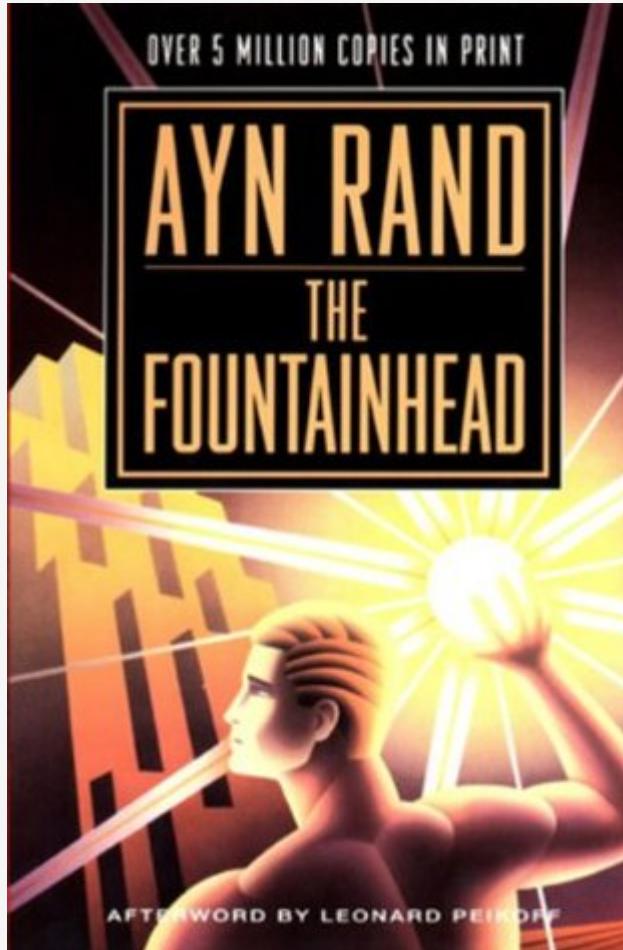
- Trade secrets, trademarks are longstanding concepts in common law
- Patent & copyright are entirely **statutory** creations, not common law
  - Legislature creates artificial scarcity, barriers to entry, & monopoly power
- Is copying the same thing as theft?



# Arguments for IP Rights



- Moral/deontological arguments
- IPR are natural rights
- Extension of Lockean self-ownership and “mixing your labor” with nature
- Should be entitled to profit off of your own ideas

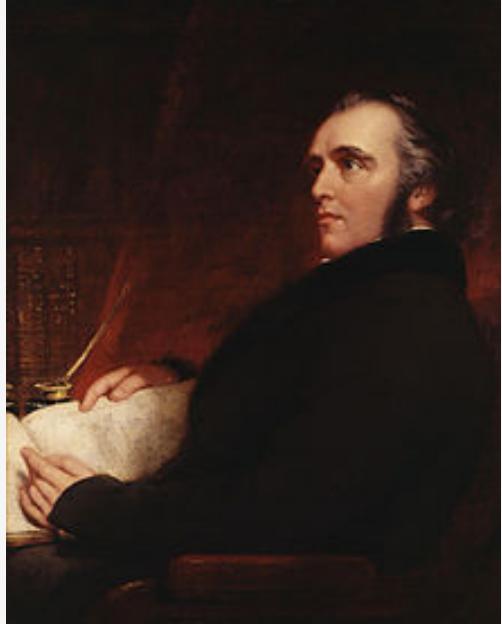


# Arguments for IP Rights



- Utilitarian tradeoff between incentives and access
  - Patents & copyrights preserve incentives to innovate (free of copying)
  - But restrict access (monopoly power)
  - So make them temporary
- Purpose is not to enrich authors or inventors, but to “promote the Progress of Science and the useful Arts”
  - At most, let producers recover their fixed costs

# Arguments for IP Rights



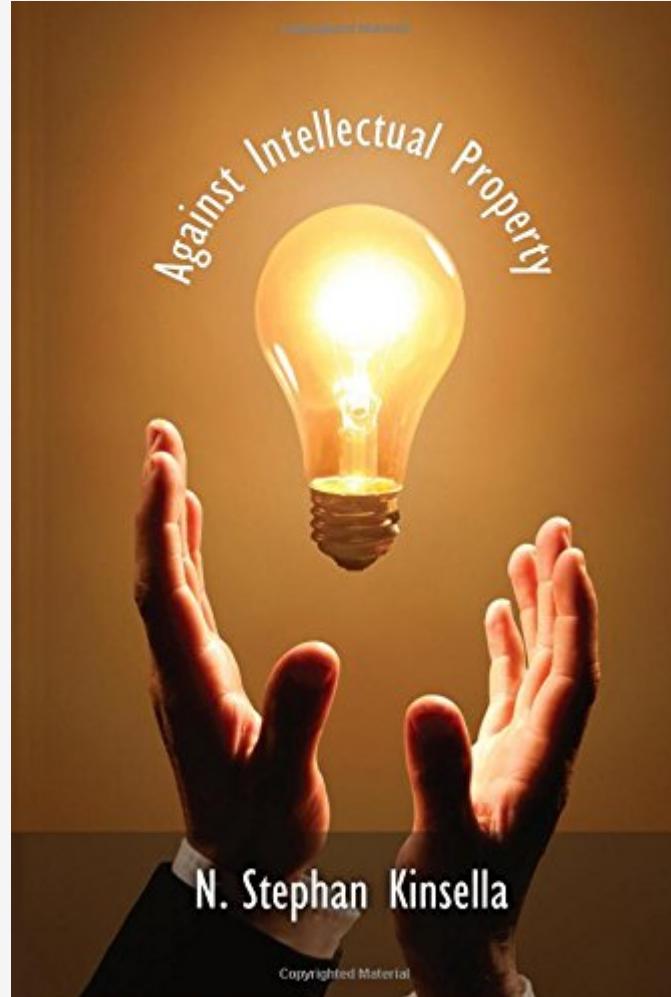
Thomas Macaulay  
(1800-1859)

"It is then on men whose profession is literature, and whose private means are not ample, that you must rely for a supply of valuable books. Such men must be remunerated for their literary labour...It is desirable that we should have a supply of good books; we cannot have such a supply unless men of letters are liberally remunerated, and the least objectionable way of remunerating them is by means of copyright...The system of copyright has great advantages, and great disadvantages...Copyright is monopoly, and produces all the effects which the general voice of mankind attributes to monopoly...Monopoly is an evil...For the sake of the good we must submit to the evil; but the evil ought not to last a day longer than is necessary for the purpose of securing the good..."

# Arguments against IP Rights



- Natural rights arguments – IP *violates* natural rights
- Unlike real property, ideas are not scarce
- Restricts what private persons are able to do with their property
- Nobody has a *right* to guaranteed profits



# Arguments against IP Rights



- Utilitarian arguments – IP *doesn't* boost innovation much, and may actively *reduce* it
- IP is mostly rent-seeking
- Innovation & creation occurs *despite* or *without* IP



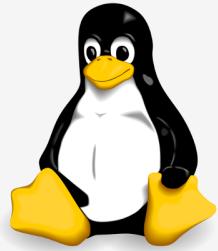
# Limits to IP



- Many valuable things exist but are not patentable or copyrightable
  - Examples: jokes, recipes, the news, government reports, fashion
- Many valuable things exist (for-profit & non-profit) but don't rely on patents or copyright
  - Open source software
  - Creative commons



LA<sub>T</sub>E<sub>X</sub>



WIKIPEDIA  
*The Free Encyclopedia*

# Limits to IP



- Reasons other than IP that innovators and artists produce
- Not-maximizing profits
  - intrinsic motivation, creativity, altruism
- Profit-maximizing alternatives to IP
  - reputation, speaking fees, merchandising
  - trade secrets, first mover advantage

# Alternatives to IP



- Trade secrets
- Prizes
  - Longitude
  - Google X prize
- Government R&D subsidies
  - grants for scientific research (NSF, NIH)
- Crowdfunding?
- Patent buyouts (Kremer)

XPRIZE

WHO WHAT ACT STORIES

GOOGLE LUNAR XPRIZE OFFERS \$4.75 MILLION TO TEAMS WHO COMPLETE IN-SPACE MILESTONES ON WAY TO THE MOON

Aug 16 2017



# Alternatives to IP: Contractual Agreements?



- Non-disclosure agreement (NDA)

# IP Controversy in a Nutshell





# Trademarks

# Trademarks



- A **trademark** or **tradename** grants protection for a word, phrase, symbol, or design which **identifies** a particular seller of goods or services, distinct from other sellers
- Prohibits sellers from using marks that are “confusingly similar” to protected marks, this constitutes **infringement**
  - Is basically **fraud**
- Trademarks last **indefinitely**, so long as the mark is being used in commerce



# Trademarks: Economic Purpose



- Allows companies to securely invest in reputation and quality
  - Consumers can easily identify quality based on seller's brand name
- If others could use same markings, consumers can't tell the difference between sellers, lose incentive to invest in high quality goods



# Trademarks: Exceptions



- Can't trademark generic names (“camera”, “app”)
- Sometimes the reverse happens: a brand name becomes so dominant, people refer to a whole product category by it
  - Examples: Kleenex, Xerox, Band-Aid, Google
  - Story of Aspirin (acetacylicilic acid); Coca-Cola investigators



# Trademarks: Registration



- Unregistered trademarks<sup>TM</sup> or service marks<sup>SM</sup>
  - “Common law trademark rights” emerge automatically from use of a distinguishing mark in commerce, enforceable in court
- Registered trademarks<sup>®</sup>
  - Can register with PTO for extra protection
  - Lasts 10 years with optional 10 year renewal

Int. Cl.: 9

Prior U.S. Cl.: 26, 38

United States Patent and Trademark Office

Reg. No. 1,114,431  
Registered Mar. 6, 1979

TRADEMARK  
Principal Register



Apple Computer, Inc. (California corporation)  
10260 Bandley Drive  
Cupertino, Calif. 95014

For: COMPUTERS AND COMPUTER PROGRAMS  
RECORDED ON PAPER AND TAPE, in CLASS 9  
(U.S. CLS. 26 and 38).

First use during January 1977; in commerce January  
1977.

The mark consists of a silhouette of an apple with a  
bite removed.

Owner of Reg. No. 1,078,312.

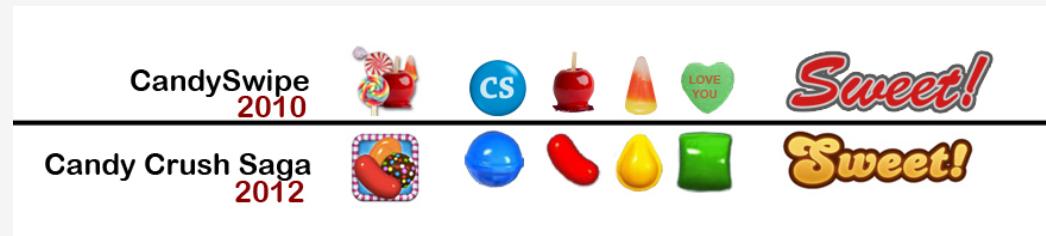
Ser. No. 162,799, filed Mar. 20, 1978.

J. TINGLEY, Examiner

# Trademark Infringement



- Trademark infringement
- Trademark dilution



Louis Vuitton



Chewy Vuiton

# Trademark Infringement



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## Lars Johnson Has Goats on His Roof and a Stable of Lawyers to Prove It

Having Trademarked the Ungulate Look, Restaurateur Butts Heads With Imitators

By [Justin Scheck And Stu Woo](#)  
Updated Sept. 17, 2010 12:01 am ET

SAVE PRINT TEXT

SISTER BAY, Wis.—Lars Johnson is proud of his restaurant's Swedish-meatball sandwich and pickled herring. But the signature offering at his Al Johnson's Swedish Restaurant isn't on the menu; it's the goats grazing on the grass-covered roof.

Any other business thinking of putting goats on the roof will have Mr. Johnson's lawyers to contend with.

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“But the signature offering at his Al Johnson's Swedish Restaurant isn't on the menu; it's the goats grazing on the grass-covered roof...Some patrons drive from afar to eat at the restaurant and see the goats that have been going up on Al Johnson's roof since 1973. The restaurant 14 years ago trademarked the right to put goats on a roof to attract customers to a business.”

“Last year, he discovered that Tiger Mountain Market in Rabun County, Ga., had been grazing goats on its grass roof since 2007. Putting goats on the roof wasn't illegal. The violation, Al Johnson's alleged in a lawsuit in the U.S. District Court for the Northern District of Georgia, was that Tiger Mountain used the animals to woo business...Tiger Mountain Market opened a grocery store and gift shop in buildings with grass on the roofs and allows goats to climb on the roofs of its buildings...Al Johnson's "demanded that Defendant cease and desist such conduct, but Defendant has willfully continued to offer food services from buildings with goats on the roof," the suit continued.”

Source: [WSJ Sept 17, 2010](#)

# Trademark Dilution



LexisNexis®



# Trademark Dilution



# Trademark Dilution



- Can sue for “**dilution** of the distinctive quality of a mark or trade name” even in “absence of competition between the parties or the absence of confusion as to the source of goods or services.”
- Less clear economic argument
  - Do we really think consumers can't tell the difference between Coca-Cola the soft drink and an auto-parts store calling itself “Coca-Cola”?



Louis Vuitton



Chewy Vuiton



# Trade Secrets

# Trade Secrets



- **Trade secret** is any information “used in one's business” that gives its owner “an opportunity to obtain an advantage over competitors who do not know or use it.”
  - formula, device, process, or piece of information
  - valuable only so long as others don’t know it



Th

