Innovation and Imitation: Migrating the World of Intellectual Capital

David J. Teece

Director, Institute for Business Innovation
Haas School of Business
University of California, Berkeley

Chief Executive Officer, Berkeley Research Group

1. Innovation is the lifeblood of all forms of capitalism
2. Putting oil based economies to one side, nation states that are rich developed and applied new technology and organizational arrangements to customer needs while providing a supporting business infrastructure
3. The era of the manufacturing economy will soon come to an end in China too. Consumers are (or will become) saturated with material goods and will begin buying services
4. Wealth generation for industrial companies involves building developing, using, and protecting intangible assets
5. The paper orchestration of these assets is as important as their ownership

What are Intangible Assets?

- Intellectual property
- Scientific, technological, industrial and business know-how
- Reputations
- Relationships

How do they get allocated?

- Good public policy
- Strong dynamic capabilities

Development of knowledge assets and their orchestration now central to firm-level competitive advantage and national comparative advantage

The Firm: Competitive advantage today is built and defended not in product markets, but "upstream" – in markets for know-how and other intangibles

(Dynamic Capabilities perspective)

The Nation: "The increase in the stock of useful knowledge and the extension of its application are the essence of modern economic growth"

(Kuznets, 1966)

- Requires the right institutional structure and ____ arrangements
- Requires a system which allows innovators to profit handsomely

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Consequences of (Semi) Globalization

- Firms everywhere can outsource to anywhere (almost)
- All firms can access the same inputs and intermediate products
- Race by MNE's to locate in low wage countries
- Profit margins are their at best absent points of difference (i.e. non-tradable assets of one kind or another)
- To avoid the "zero rent trap" firms need to:
  - Superior product offerings which requires VRIN resources

Such differentiation more after than not involves leveraging intangible assets

Resources

- Ordinary Resources are commodities
- VRIN Resources are:

Valuable
Rare
Inimitable
Non-Substitutable

These constitute "strategic resources"

Main Classes Of Intangibles

1. Technological know-how
2. Intellectual property
3. Business process know-how
4. Customer relationships advantage
5. Reputations
6. Ordinary Capabilities

Fundamental assets for competitive (necessary but not sufficient to win)

None of these assets are on balance sheets; they often lie “upstream” from the product market.

How do they get built allocated/developed adroitly?

- Good public policies
- Strong dynamic capabilities

Why Have Knowledge Assets and Dynamic Capabilities Become so much More Valuable?

- VRIN resources and especially intangibles with foundation for product and process improvement
- Intangibles are hard to build and difficult to manage and impossible to buy
- Inherently not as easy to access as some other assets
- Hold certain "strategic value" (price ≠ value in use); illiquid markets (non-traded assets)
- Legal barriers to imitation
  - Strong in some industries in some countries, eg, pharmaceuticals, electronics
  - Undermined in others, e.g. digital music and movies

Dynamic Capabilities

Asset orchestration skills require entrepreneurial managers that are a rare breed

The Markets For Intangible Assets Do Not Function Like Commodity Markets

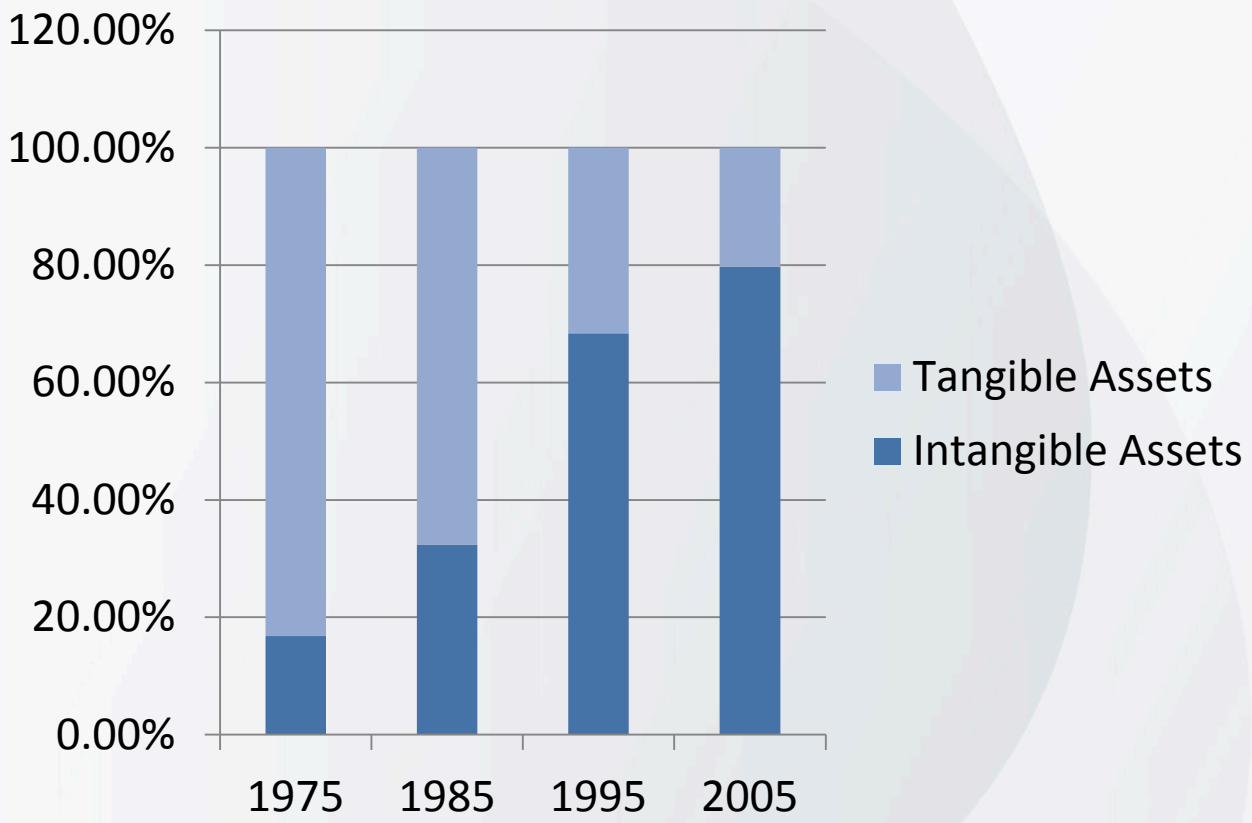
- The market for know-how has characteristics that complicate exchange
  - Property rights poorly defined
  - Utility unclear
  - Few buyers and sellers
  - High transaction costs
- These complications create imperfections which impair imitation, but potentially support quasi rent generation (“strategic value”)

Characteristics	Know-how IP	Physical Commodities
1. Recognition of trading opportunities	Inherently difficult	Posting frequent
2. Disclosure or attributes	Relatively difficult	Relatively easy Broad
3. Property rights	Limited (trade secrets, copyrights, etc.)	Measurable units
4. Item of sale	License	
5. Variety	Heterogeneous	Homogeneous
6. Unit of consumption	Often unclear	Value, weight
Inherent tradability	Low	High

The Changing World…

- Intangible and or intellectual assets (IA) dominate portion of overall market valuation
- Balance sheet silent about native IA. Accounting standards inadequately handle IA valuation. Current reporting practices do not support transparency of resource allocation…
- IA serve as aggregators of value from investments in innovation and knowledge
- Competitive advantage, growth and wealth creation accrues to those firms who proactively manage these assets

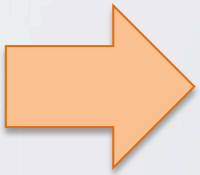
Valuations Shift to Intangibles



Chiquita- Perishables Bananas become a Commodity Business

Product Challenge

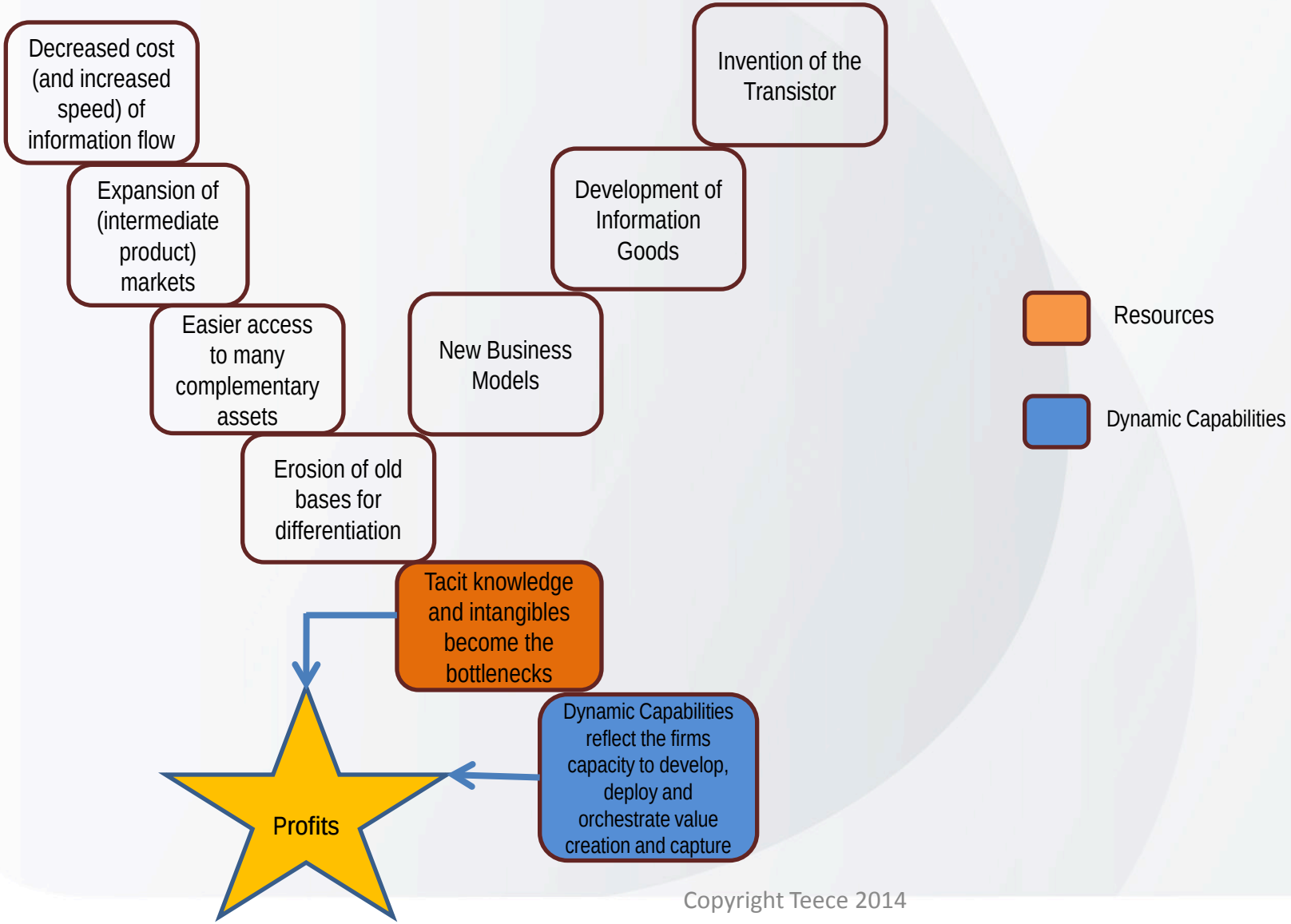
- In the 1990's, Chiquita's once highly profitable banana business turned into a price-competitive, commoditizing market
- Rising competition (Dole & Del Monte) and big retailers (Wal-Mart) eroded margins
- Trade practices restricted markets



Innovation

- Began search for production innovation by looking at Chiquita's overall growth opportunities
- Created an "innovation roadmap" of opportunities:
  Extending product shelf-life
- Increasing efficiencies of production and packing
- Introducing new banana varieties

The Basis Of (Firm Level) Competitive Advantage In The Age Of Advanced Information Technology, Ubiquitous Markets, And Deep Marketplace Uncertainty



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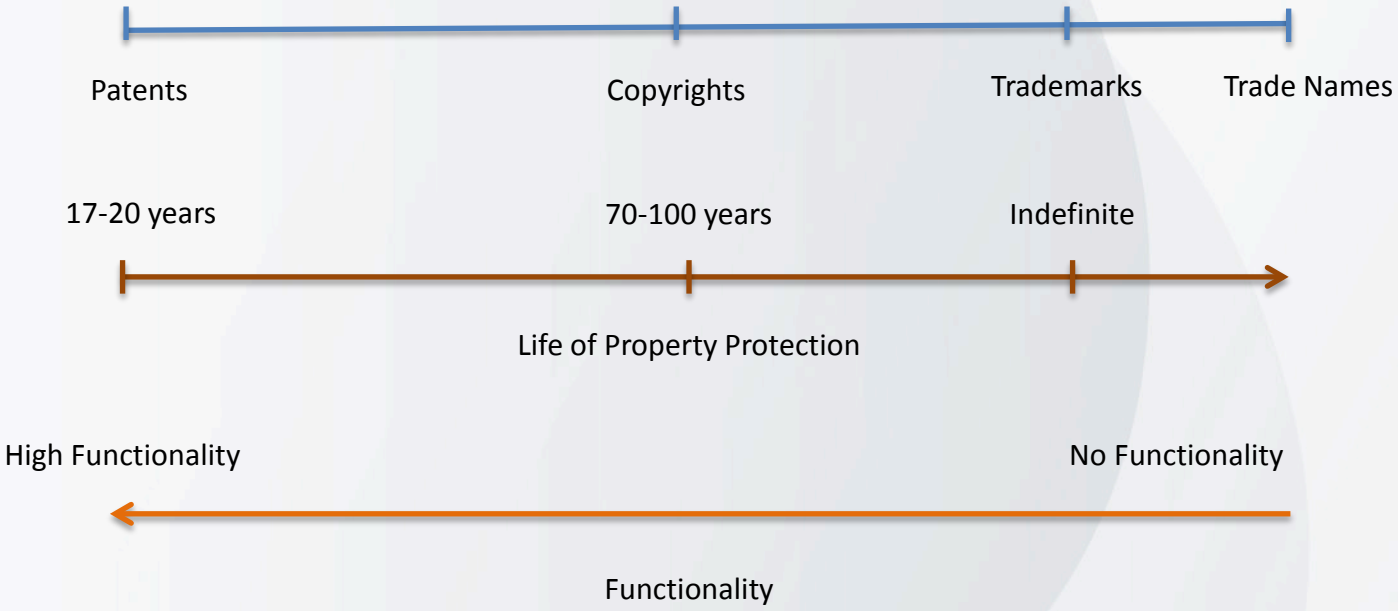
Old and New Conceptual Frameworks and Anchoring Concepts for Business Analysis and Performance

Conventional	Next Generation
Tangible Assets	Intangible Assets
Industry Analysis	Ecosystem- Level Analysis
(Vertical) Integration	Modulation
Managerial Integration	Entrepreneurial Modulation
One Product, One Patent	One Product, Hundreds of Patents
Transaction and Aging Costs	Transaction and Aging Costs
Equilibrium	Equilibrium
Resources Matter	Resources Matter
Regional Geography Irrelevant	Regional Geography Matters

What am I saying that is Different from Conventional Wisdom?

1. The textbooks are out of date and have been for some time
2. *"Innovation is about much more than new products. It is about reinventing business processes and building entirely new markets that meet untapped customer needs."* (Samuel j. Palmisano, CEO of IBM, Business Week, 4/24/2006, p. 64)
3. *Next generation competition has already arrived*
4. *Intangible assets and intellectual property increasingly ___ to competitive advantage*
5. *Implementing best practices not sufficient to achieve global competitive advantage*
6. *Dynamic capabilities are key to competitive advantage at the level of the firm*
7. *The ecosystem, not the industry, is what undergirds competitive advantage*

Intellectual Property (IP) Continuum of Protection



…a Framework for IP Life Cycle Management

Part II

In part II, I will focus on just two elements of the framework:

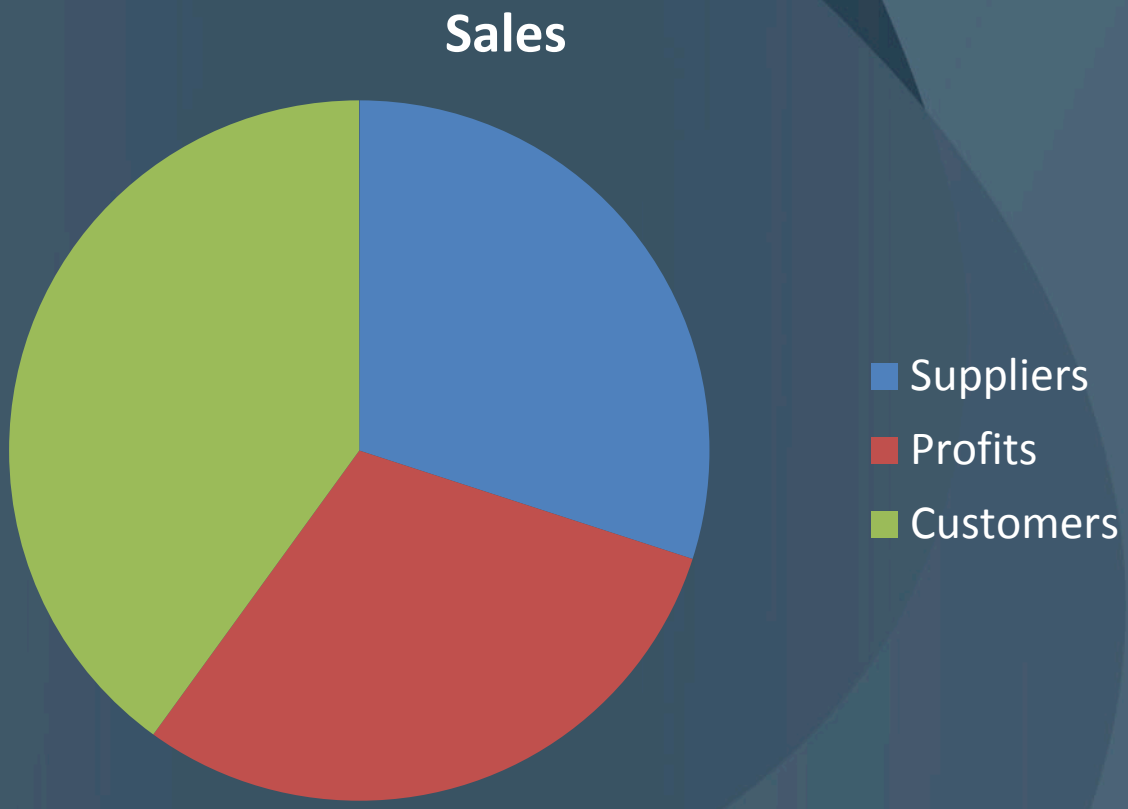
1. The role of intellectual property in the global innovation system: present and future
2. The role of districts/clusters in regional development

Factors at Work

1. Appropriability Regime
2. Complementary Assets
3. Timing

The main focus for the rest of my talk is the appropriability regime, and in particular the role of I.P.

Three Challenges for a Private Firm is to Increase their Share of the Pie



The Profiting from Innovation Framework: How Firms Capture Value from Innovation

1. Social returns to innovation are typically much greater than private returns

   Maurfield: Private Social

   Pilkerton Glass: XVY

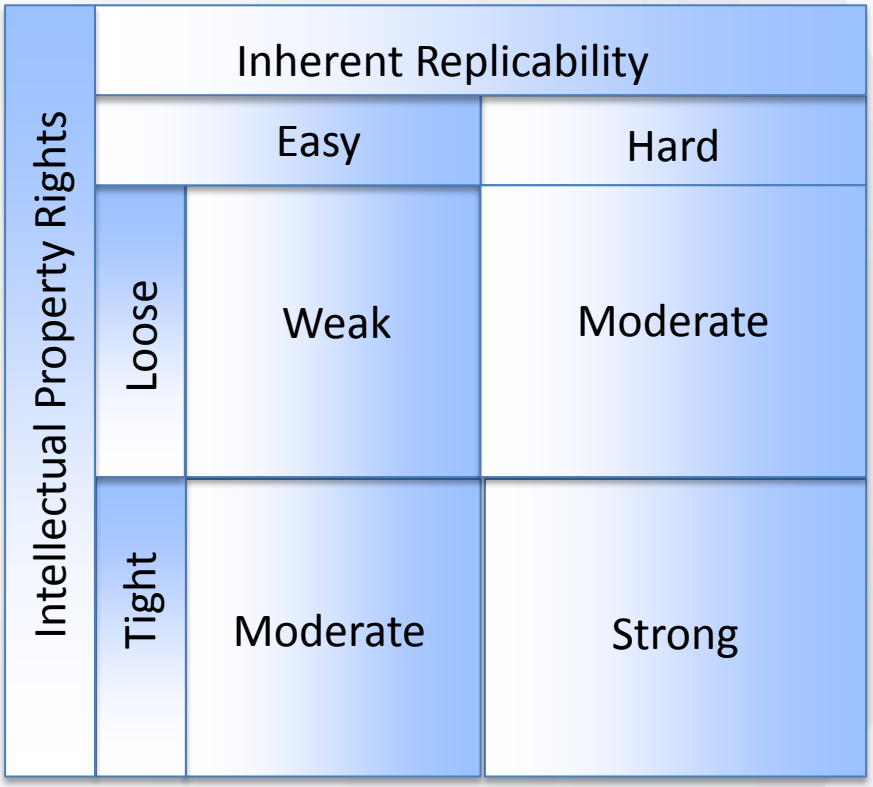
2. The Baumol exception must be noted:
   - Productive and destructive (rent seeking; organized crime)
   - This negative result occurs when society has a wrong set of rules (i.e. structure of payoffs)

William Baumol

"Did it not frequently happen during the course of Chinese history that the scholar-officials, although hostile to all inventions, nevertheless gathered in the fruits of other people's ingenuity? I need mention only three examples of inventions that met this fate: paper, invented by a eunuch; printing used by the Buddhists as a medium for religious propaghanda; and the bill of exchange, an expedient of private businessmen."

Baumol, William J., Entrepreneurship: Productive, Unproductive, and Destructive, JPE 1990, p. 903

Appropriability Regimes for Knowledge Assets



Importance of Complementary/Co-Specialized Assets

- Innovations generally need to be paired with complementary (and/or co-specialized) assets in order to generate value
- Complementary assets can take many forms
  - Entrepreneurial capabilities
  - Skilled/knowledgeable workforce
  - Tangible assets (plant, etc.)
  - Distribution capabilities
  - Suitable business model
    - Marketing and promotional efforts

Key Features of Patent System

- Patents are "probabilistic"
  - There is only some positive probability that a given patent will be found valid and infringed by a given product
  - Three distinct probabilities
    - Raw probability of finding of validity and infringement
    - Probability that a patent will be found valid/infringed when it *should not* be : "False positive" (Type I) errors
    - Probability that a patent will be found *in*valid/*not* infringed when it *should* be: "False negative" (Type II) errors
    - Parties can *disagree* about all of three of these probabilities
    - Empirical data from US/Europe shows that about 50% of litigated patents are found valid/infringed
- Patents are not self-enforcing
  - Unlike suppliers of tangible inputs, who can withhold their goods unless they are paid, patent holders have to rely on (costly, time-consuming, risky) litigation to protect their rights
  - Lemley: many implementers simply ignore patents unless/until forced to pay attention
  - Conversely, firms can be falsely accused of infringing others' patents, be forced to defend themselves against patent litigation

Patent Quality Issues

- Not so much a concern about patent over/under-breadth per se, as about a "mismatch" between the scope of the invention and the scope of the patent grant
- 45-degree line diagram

Improving Patent Quality

- In the patent examination process
  - Improving quality is costly
    - Lemley: "Rational Ignorance" at Patent Office
      - does not make economic sense to improve quality unless it matters
      - most patents are never practiced/litigated
      - Varies with type of patent, technology field
- In the patent enforcement process: parties
  - Winnowing out spurious litigation/defenses
- In the courts
  - Claim construction and enforcement

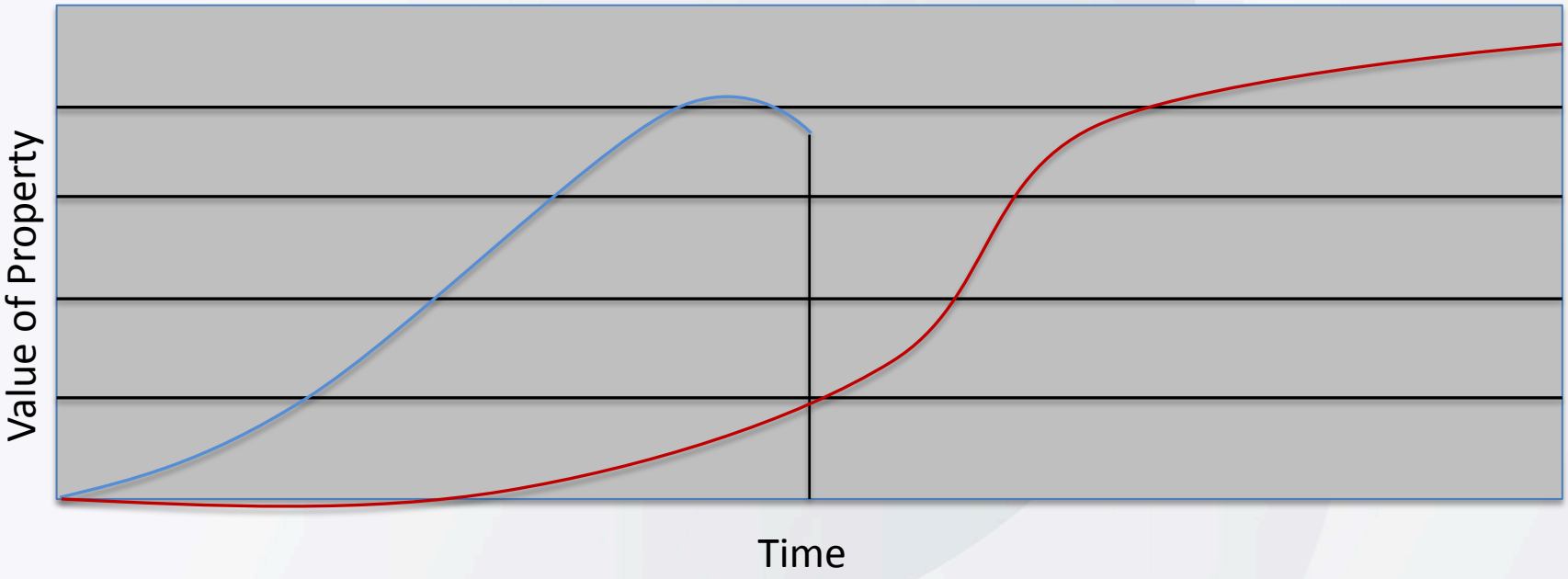
“Strategic” Patents

- Most patent coverage is directed to a specific solution to a customer need
- Innovators should seek patent coverage that focuses on benefits to customers, not know the problem is solved
- Patents that cover only one solution to a broad customer need will allow competitive to solve the same customer need with a non-intriguing substitute
- Patent coverage that secures benefits over features will provide a greater barrier to immitation
- A strategic patent is thus one that is market making

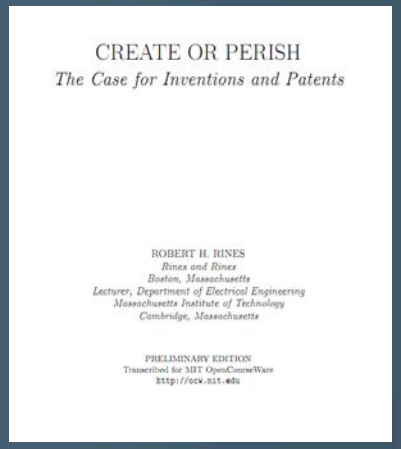
The value of an invention to the innovator can also be enhanced by patenting improvements… e.g. DuPont has secured over 50% with the patented inventions that directly build on this discovery

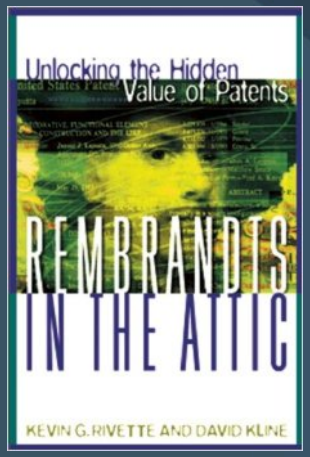
Value Transference:

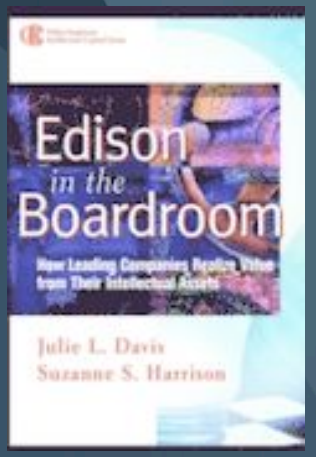
The premeditated use of multiple IP regimes across the product life cycle to achieve sustainable differentiation

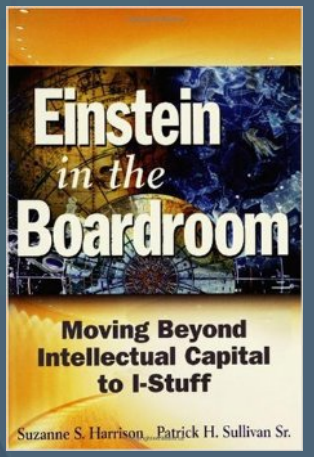


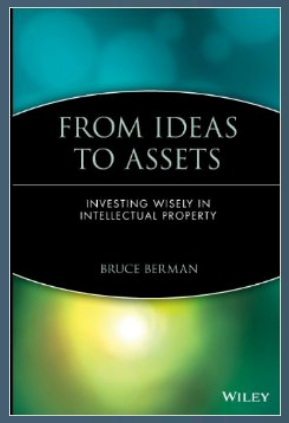
A Plethora of Books about IC & IP Management…

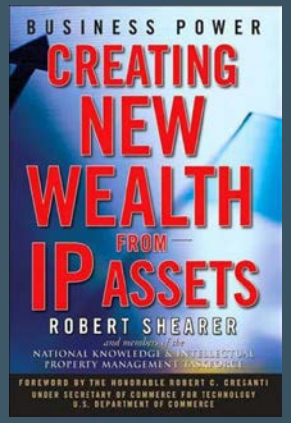


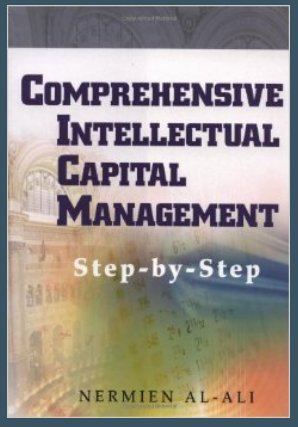


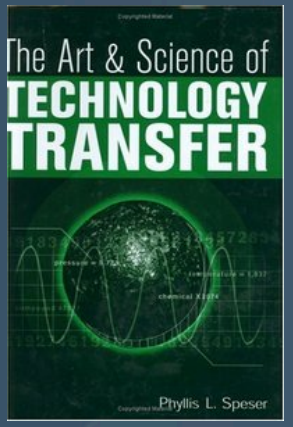












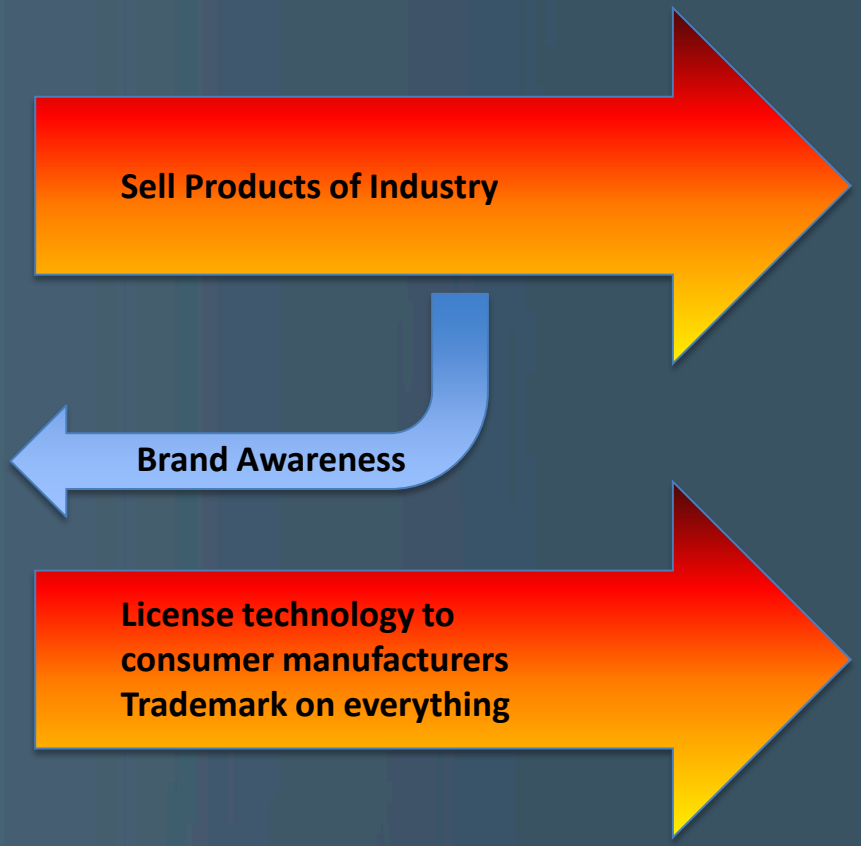
Business Model

Ray Dolby

"I have a general principle that I follow. I don't go into any area that I cant get a patent on… [otherwise], you quickly find yourself manufacturing commodities."

Ray Dolby, June 23, 1986, San Francisco Business Journal Review

Business Model



718 Registered trademarks in 98 countries; 81 in the U.S.

"Trademarks are one of Dolby's most valubale assets."

Dolby.com, 2003

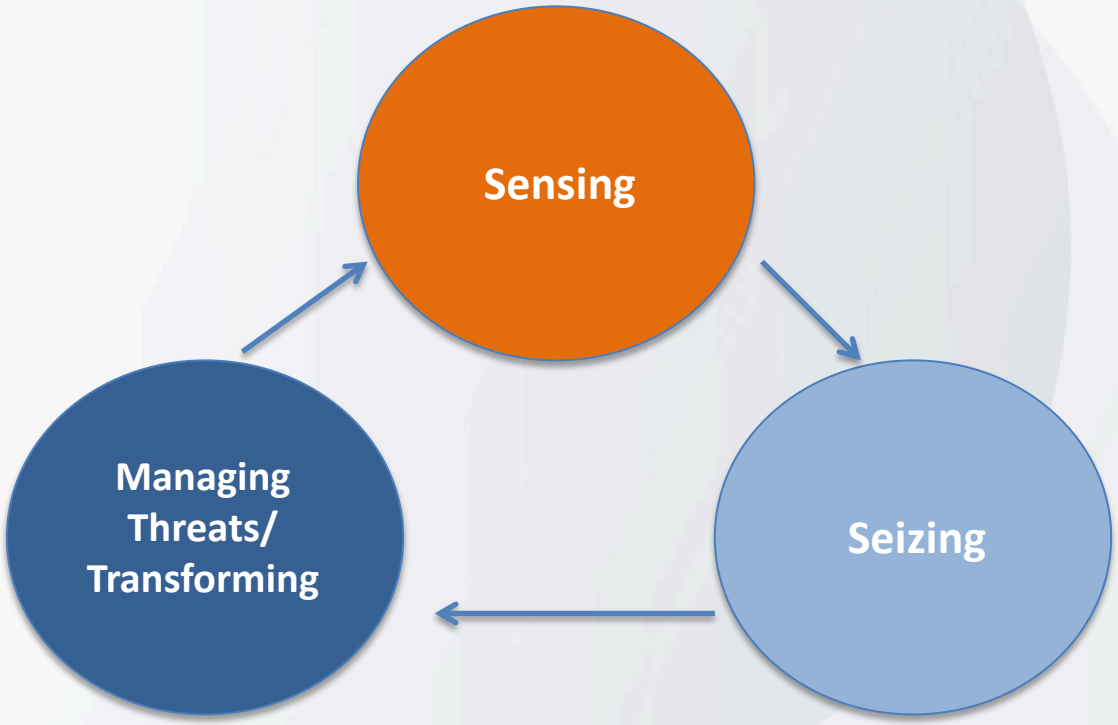
Monsanto Context 1995:

- Ninety year old chemical company with historic experience in herbicides, food ingredients and agricultural markets
- Herbicides important by only way to meet anticipated demand from population growth is through improved crop yield
- Monsanto leadership senses opportunity in recombinant DNA technology as applied to improved yield (performance) of major crops
- They are not a crop seed company but rather a herbicide company. See is an adjacent market…
- They do have the technology to participate in the agribiotechnology revolution… Mary Clinton Smith and other leading plant geneticists from academia
- How does Monsanto transform itself to become the leader in an adjacent seed market and benefit from the inevitable demand growth in emerging economies

Monsanto Case Observations:

- Monsanto has transformed itself from the ninety year old chemicals firm to the modern day innovator at the heart of agribusiness
- Original opportunity and initially seized by Shapiro was more or less on point
- Executing transformation took much more time than expected due to both market and non-market factors…
- While Shapiro sensed and initially seized, it took others to execute the transformation

Explicating Dynamic Capabilities: The Nature and Micro-foundations of Sustainable Enterprise Performance



Types of Patents in China

- Invention patents (20 year life)
- Utility models (10 year life, streamlined application approval process)
  - Infrequently used by foreign inventors
- Design patents (10 year life, streamlined application approval process)

Growth of Patenting

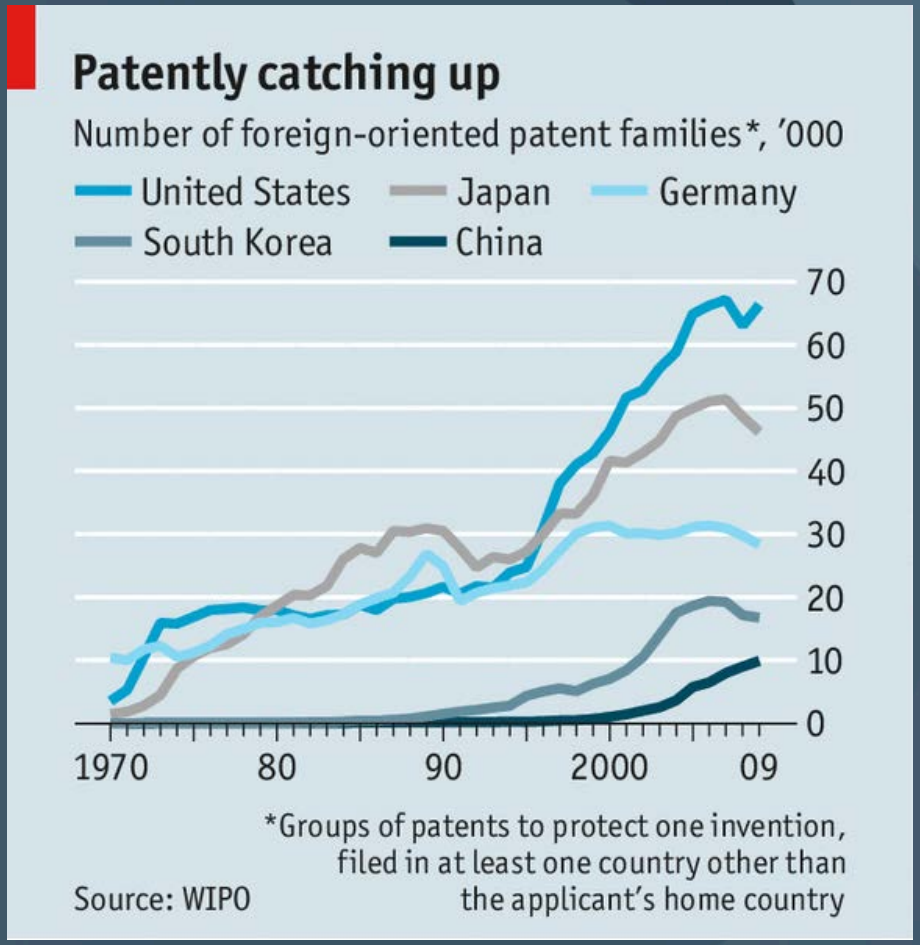
- China has overtaken the U.S. as the country issuing the most patents
  - Caveat: many are utility model patents, which have no analogue in other countries
  - Concern is not with patent quantity *per se*, but patent quality; some concerns have been expressed about quality of patents from China
- Chinese firms have also increased their level of overseas patenting, though still lag behind many other countries
  - GRAPH showing patenting in:
    - US
    - Europe
    - Japan
    - China

Compensation for Patent Holders: Damages and Licensing

- In theory, Chinese courts can award several types of patent infringement damages
  - Patent holder's actual losses due to infringement
  - Defendants' gains from infringement
  - Reasonable royalty
  - Statutory damages
    - Capped at RMB 1 million (US$160,000)
  - However, in practice limitations on discovery often mean that courts award statutory damages because patent holders cannot prove entitlement to more

Proposed Revisions to Damages

- Allowing awards of punitive damages (up to treble damages for deliberate patent infringement)
- Allowing Patent Bureaux to award damages
- Changing the allowable statutory damages
- (Possible) awarding damages for infringing products made in China but exported



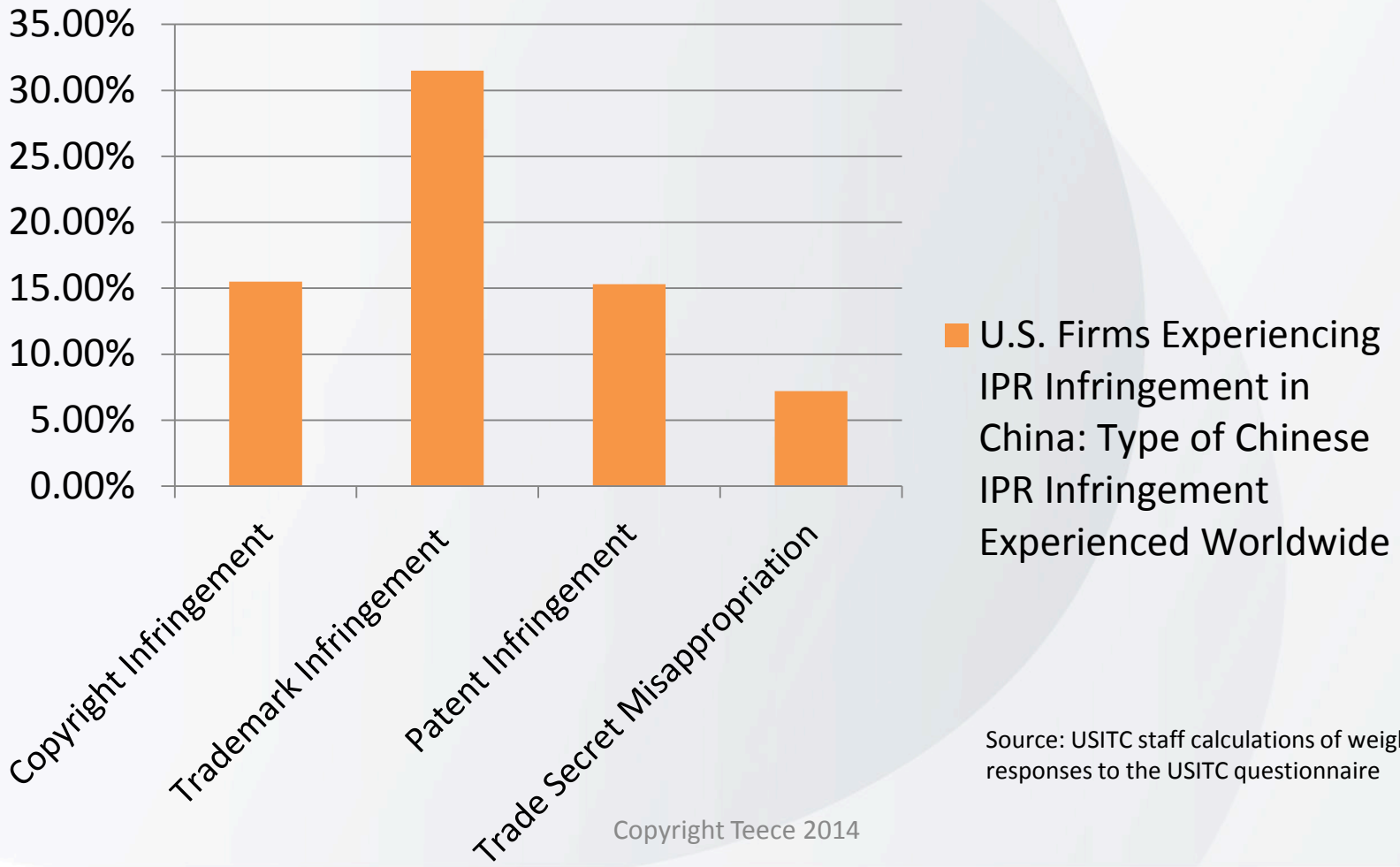
IPR infringement negatively impacts both domestic and Chinese firm's MNE's

Online infringement in China is a significant concern for foreign IP intensive firms

USTC claims that:

- Copyright infringement is the most damaging form of IPR infringement ($23.7 billion)
- Trademark infringement is the most common form of IPR infringement
- IPR enforcement varies significantly at local levels

U.S. Firms Experiencing IPR Infringement in China: Type of Chinese IPR Infringement Experienced Worldwide



Source: USITC staff calculations of weighted responses to the USITC questionnaire

- Special problems of trademark infringements from “super fakes” counterfeit (copy exact) products from spinoff of contract manufacturers supplying foreign firms, e.g. footwear, blue jeans
- Online sale makes identifying counterfeits harder (at least as compared to street vendors)
- Piracy sale makes identifying counterfeits harder (at least as compared to street vendors)
- Counterfeit mobile markets often conflicted with legitimate low cost handsets made by “white label” manufacturers in China

Consequences:

1. Chinese firms distracted from innovation by ease of counterfeiting/imitating
2. High tech MNEs get fed up and relocate away from China… China may not be aware of the investment that isn't made for fear of misappropriation

China must move to "new economy" products and services too

- Many Chinese businesses built on cheap labor and ordinary capabilities to produce commodity (i.e. undifferentiated) products
- Some businesses have reached practice and sell technology based goods… but so do other firms in China and elsewhere

"Nike will produce more trainers (sneakers) in Vietnam this year than in China, it is the leading source for 15 years"

Economist, Feb. 19, 2009

"With rare exceptions, notably Lenovo, which purchased IBM's laptop business and Haier, the maker of cheap refrigerators… Chinese names have failed to make much of a dent"

Economist, Feb. 18, 2009

The main reason for this, according to the Economist, is "the country's weak intellectual property protection. Why invest in design or innovation when the results can be knocked off by competitors"

Economist, Feb. 18, 2009

What Should be Private and What Should be Public

- Both private and public aspects of technology play an essential role in its advance
- Technical advance inevitably proceeds through improvements (variety) driven by competitors
- New findings and understandings do not adhere to their finders/creators for long but are, at least to some extent, shared amongst contemporaries
- Hence, technology advances through a social, cultural, and evolutionary process
- When a technology goes public, there are often many efforts to improve it
- As Richard Nelson notes, the "public" aspects of technology exist in part because firms leak and share knowledge… not just because of holes in I.P. shields

- **Why Care?**
  2003: 80% of the value of Fortune 500 companies is in the intangible.

  Today:
  P&G: 67% **Apple: 95+%**
  Google: 97+%

So what in your IP portfolio can enhance your brand?

Patents for WiFi, earphone ports, CPU, Camera, etc.

Trade Secret for Supplier lists, supply chain

Patents for hardware, Mfg methods, function

Design Patent for overall look

Copyright for photo, Icon designs, software

Trademarks for iPad and Apple logos

Legal Protections as Islands in the Sea of Free Competition

"Intellectual property protections are like islands in a sea of free competition… If one is not able to place the fruits of one's investment, ingenuity, or creativity no one or more of the islands then on in the sea"

"The copyright island, which is low and sandy, has a gradual sloping beach called the merge idea and expression. Thus, opinion may differ on how far out one has to wade before the boundary is crossed; that is, when the water is up to your neck, are you still on the island?"

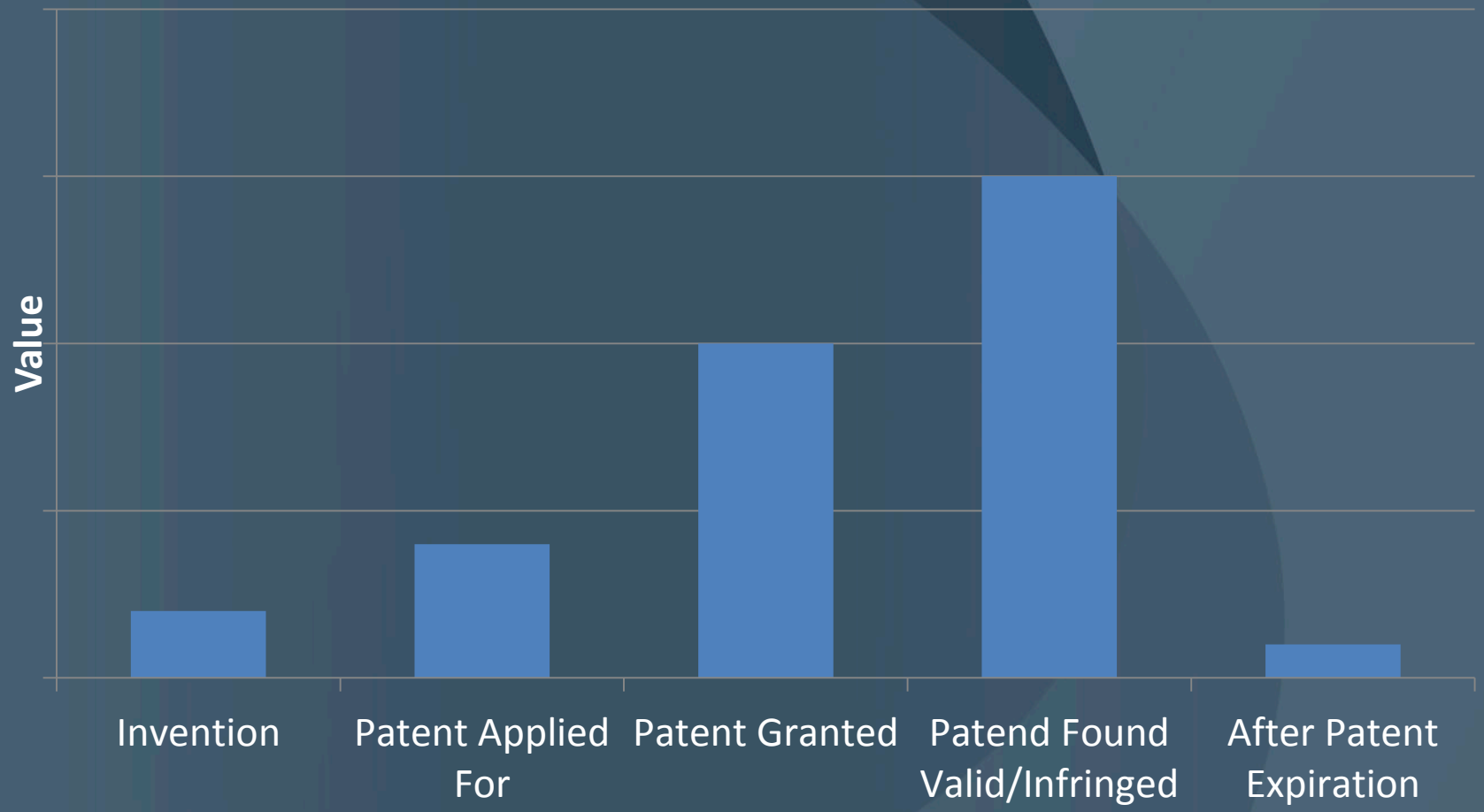
"The patent island is a volcanic island with sheer cliffs rising to a commanding view of the surroundings. But the patent island also has a sandy beach, tucked away in a corner. It is called the doctrine-of-equivalents beach"

Computer Science & Telecommunications Board National Research Council,
"Intellectual Property Issues in Software"

The Uncertain Nature of IP Rights

- "Fuzzy boundaries"
  - Unclear how claims will be interpreted in practice
  - "inadvertent" infringement can occur
  - Unclear boundaries "fouls up" workings of the Coase Theorem
  - Disputes over value are not uncommon
  - IP "discounted" in the marketplace as a consequence

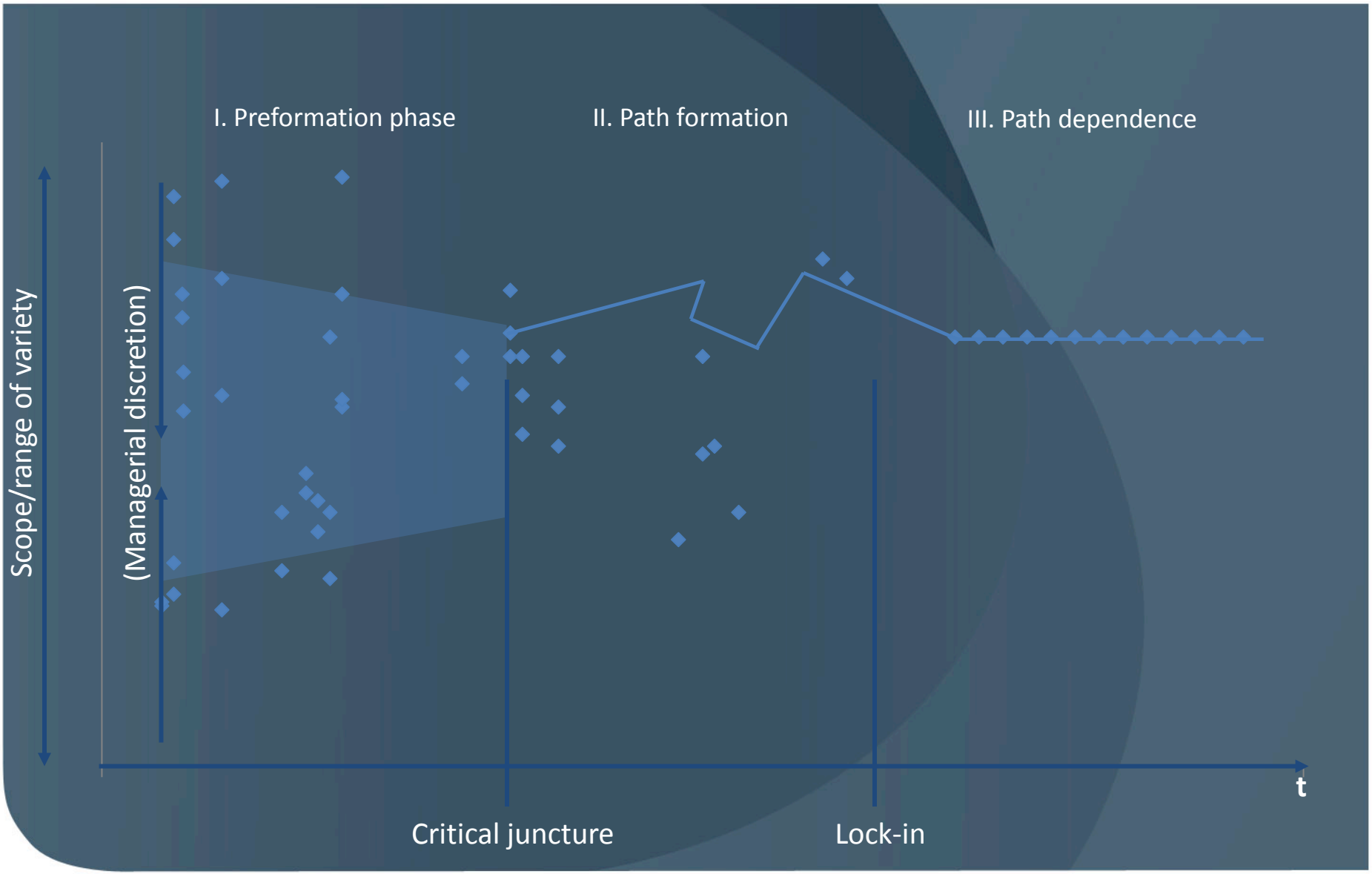
Value and Stages of Patent Life



Other Elements of Appropriability Regimes

- Other IP (trade secrets, copyright)
- Complementary assets
- Lead time to market (first mover)
- Learning curve cost advantage

Constitution of an organizational path: A modified and expanded model



Importance of Bulk Licensing

- Bulk/package licensing and/or cross-licensing are important (and justified) when innovation is systemic
  - Too costly to license patents one at a time
    - Cannot test all patents against all products
    - Not practical to condition royalties on a product-by-product, patent-by-patent basis
  - Achieves design freedom and freedom to operate

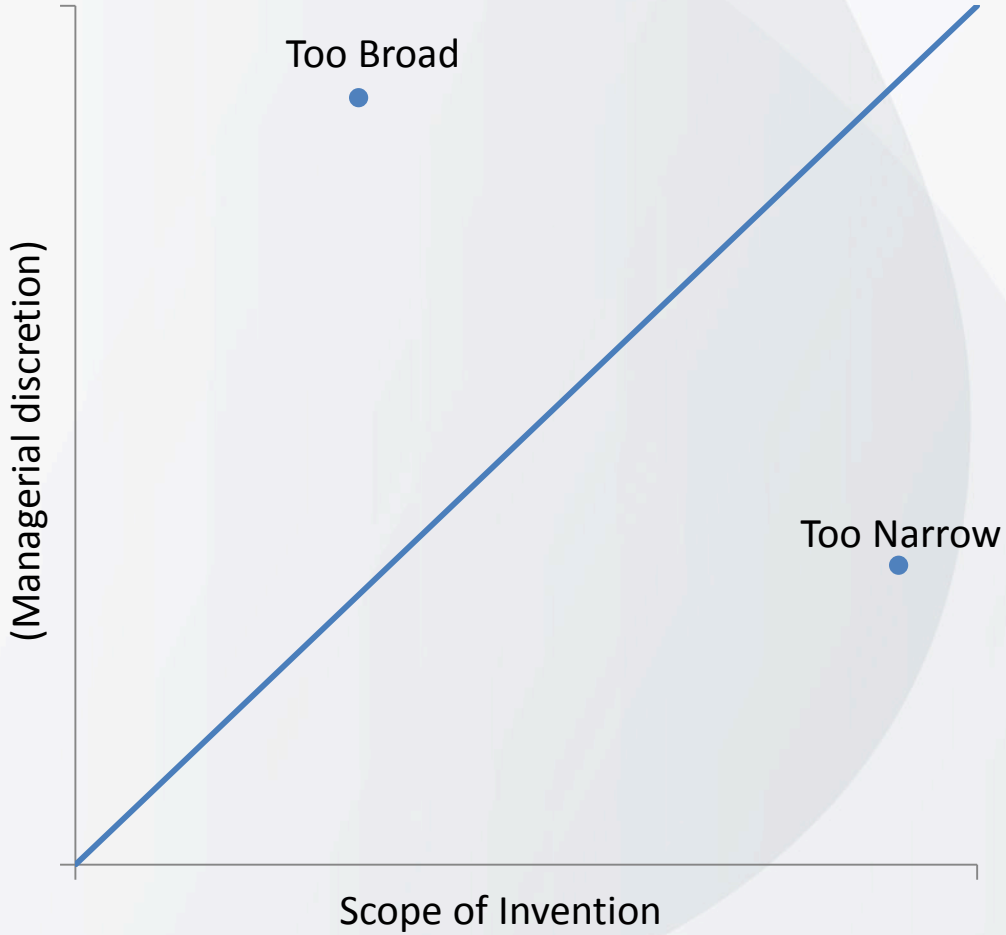
“Patent Thickets”

- Patent thickets may or may not map to “technology thickets”
  - Numerous patent grants may reflect numerous technological breakthroughs
  - Whether patent thickets are desirable or undesirable depends on whether or not they are undergirded by technology thickets

Complements vs. Substitutes

- Many “patent thickets” involve complex mixture of substitutes and complements
  - Especially in the context of bulk licensing
- Cross-licensing of complementary patents is unambiguously good
- Cross-licensing of substitutes sometimes requires further analysis

Patent Breadth Issue

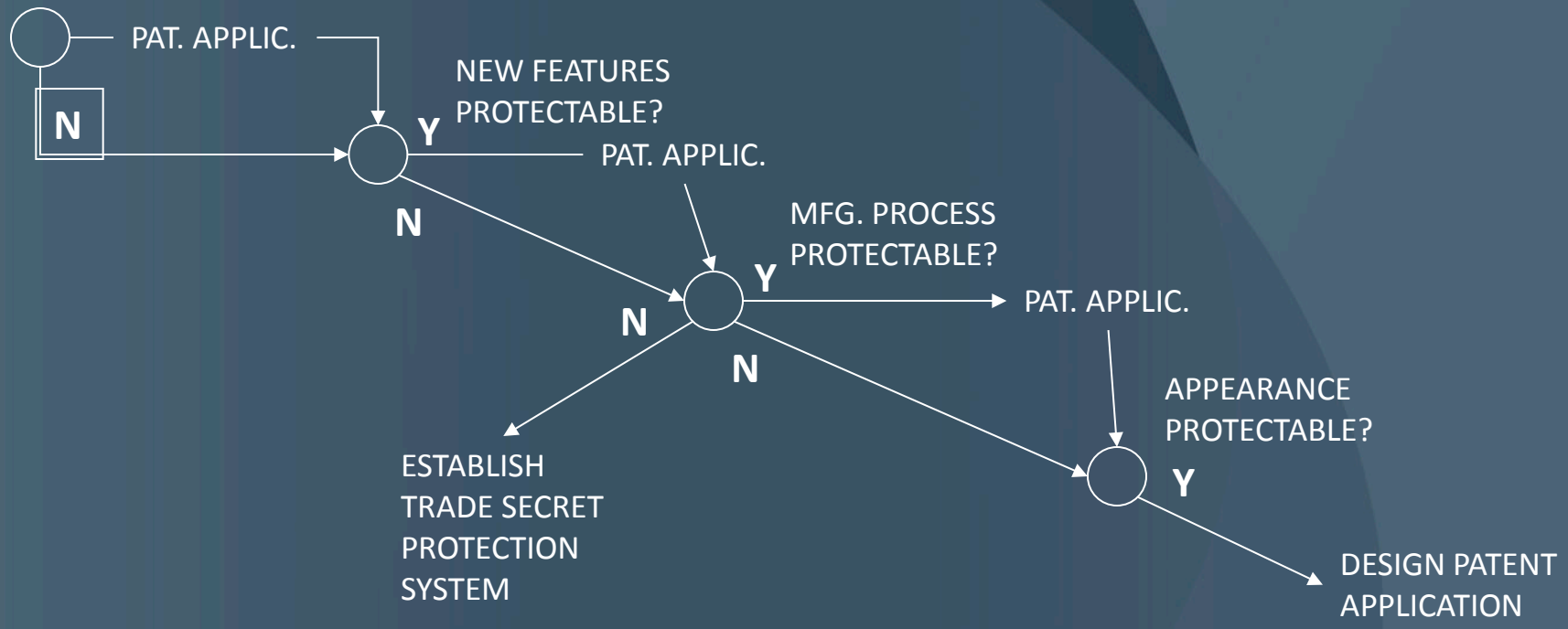


Characteristics of Legal Forms of Protection in the USA

Considerations	Copyright	Trade Secret	Patent	Trademark	Mask Works*
National Uniformity	Yes	No	Yes	Yes	Yes
Protected property	Expression of ideas	Secret information	Invention	Goodwill	Semiconductors
Scope of protection	Exclusive right to reproduce, prepare derivate works, publicly distribute, display and perform	Right to make, use and sell secret and to protect against improper use or disclosure	Right to exclude others from making, using, selling	Proscribes against misreprentation of source	
Effective date of protection	Creation of Work	From date of conception or receipt of secret information	Patent application date	Use and/or filing date of US application issuing as principal registration on or after 11/16/89	First commercial exploitation
Cost of obtaining protection	Low	Low	Moderate	Low	Moderate
Term of protection	Life of author plus 50 or 70 years	Life of author plus 50 or 70 years	20 years	20 years	10 years
Cost of maintaining protection	Nil	Moderate	Moderate	Moderate	Nil
Cost of enforcing rights against violators	Moderate	High	High	Moderate	Moderate

*Semiconductor industry only

Enhanced Intellectual Property Protection Around a Core Technology



Some big IP damage amounts

BERKELEY RESEARCH GROUP

- Samsung vs Apple (patent damages) $1+b
- Polaroid vs Kodak (patent damages) $800+m
- Rambus vs Hyundai (patent damages) $300+m
- Lexar vs Toshiba (trade secret misappropriation) $100+m

Patents

- Lost profits
  - For patent owners to receive damages based on lost profits, the patent owner must prove (Panduit factors):
    - Demand exists for the infringed product
    - Acceptable non infringers substitutes were not available
    - The patent owner had the capability to exploit the demand
- "Reasonable" royalties
  - The amount the parties would have negotiated at or about the time of first infringement, knowing that the patent was valued and infringed

Lost profits involves estimating incremental profits

- Lost profits = Lost sales minus Variable cost
- Variable costs: Those cost directly related to sales volume (ex: manufacturing & selling costs)
- Overhead cost are generally (but not always) fixed costs

Incremental (lost profits) calculation

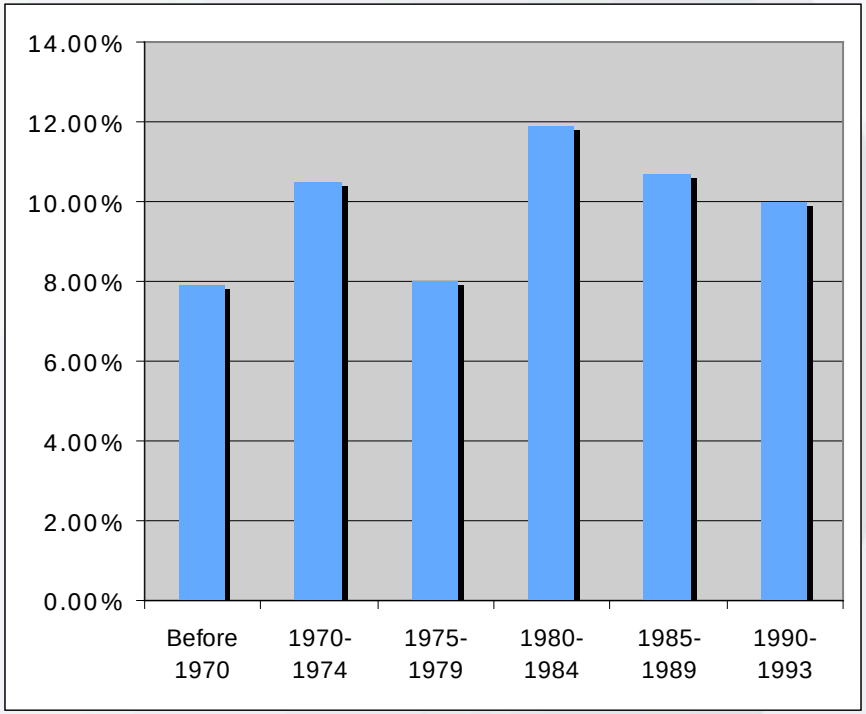
Additional unit sales in the “but for” world	1,000
Price per unit	$500
Incremental revenue	**$500,000**
Incremental costs	
Manufacturing at $100 /unit	$100,000
Research & Development	0
Marketing and Selling at $50 /unit	$50,000
Total incremental costs	**$150,000**
Total incremental (lost) profits	**$350,000**

“Reasonable” Royalties (Georgia-Pacific vs US Plywood)

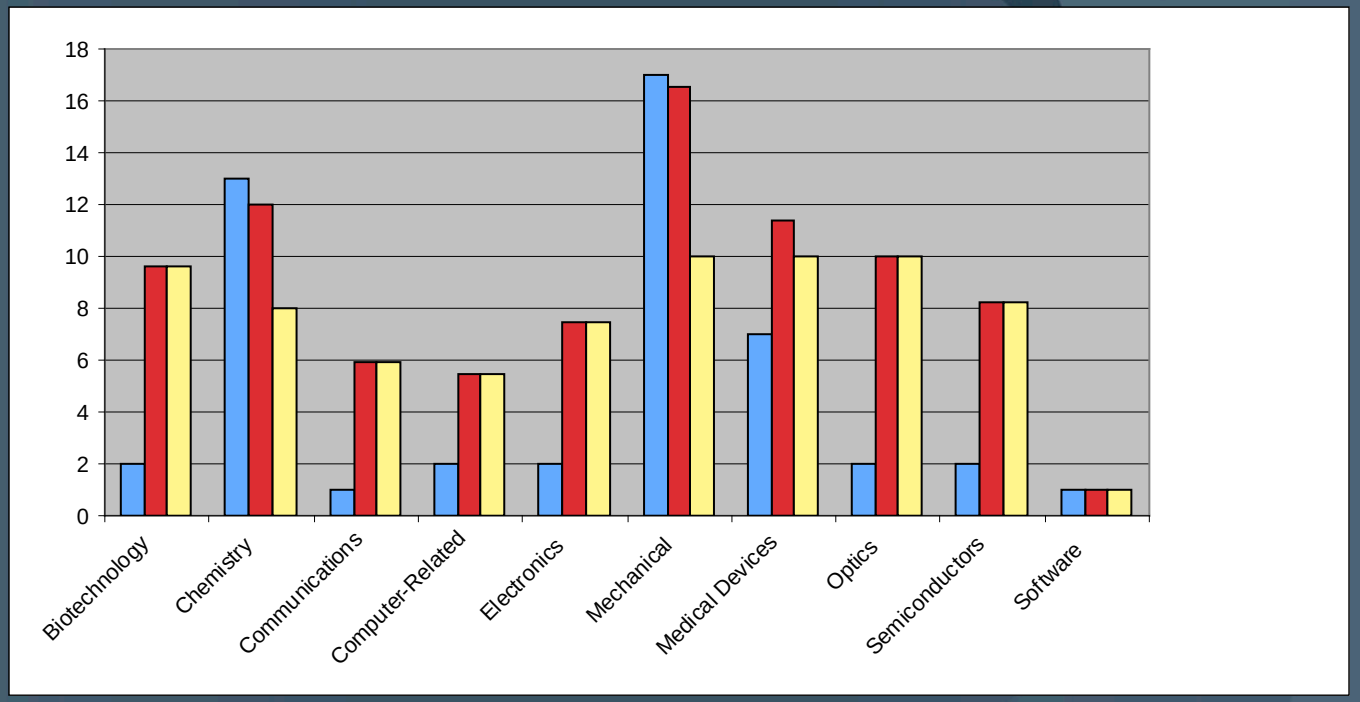
- **Factor 15**

  The amount that a licensor (such as the patentee) and a licensee (such as the infringer) would have agreed upon (at the time the infringement began) if both had been reasonably and voluntarily trying to reach an agreement; that is, the amount which a prudent licensee-who desire, as a business proposition, to obtain a license to manufacture and sell a particular article embodying the patented invention-would have been willing to pay as a royalty and yet be able to make a reasonable profit and which amount would have been acceptable by a prudent patentee who was willing to grant a license.

Average adjudicated royalty rates



Mean and medium adjucated royalty rates in the US (1982-mid 2005)



Profiting from innovation

- IP is a key element
- Business strategy must also support and take into account available IP protection
- Good market entry strategies will balance IP considerations with other factors

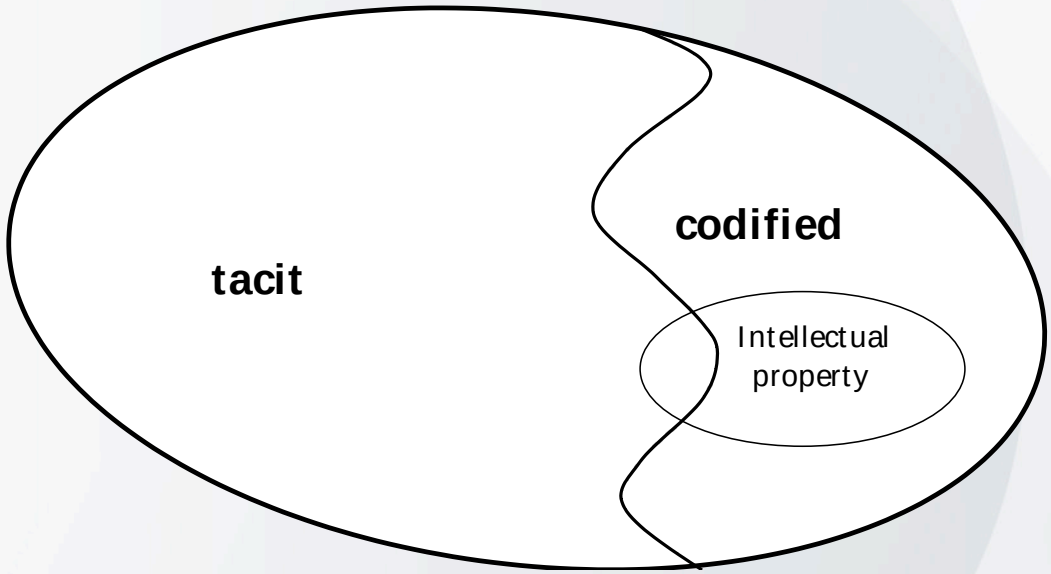
Market Entry Strategies: Failures & Successes

	Innovator	Follower-Imitator (within the decade)
Win	▪ Pilkington (float glass) ▪ Du Pont (Teflon) ▪ W.L. Gore (Goretex) ▪ Apple (iPod) ▪ Silicon Graphics (computer graphics)	▪ S.W. Airlines (discount airlines) ▪ Sony (transistor radio) ▪ Dell (personal computer) ▪ Matsushita (VHS video recorder) ▪ Boeing/Airbus (civilian jet airliner)
Loose	▪ Laker Airlines (discount airline) ▪ EMI Scanner (medical imaging) ▪ Xerox (personal computer) ▪ AMPEX (first video recorder) ▪ Sony (Betamax video recorder) ▪ De Havilland (Civilian jet airliner) ▪ Lexar (Flash memory controllers)	▪ DEC (personal computer) ▪ Intel (digital watch) ▪ Peoples Express (discount airlines)

Appropriability Regime: Key Dimensions

- Legal instruments
  - Patents
  - Copyrights
  - Trade secrets
  - Trademarks
- Inherent immitability of industrial knowledge
  - Codified (“non articulable”)
  - Tacit (“articulable”)
  - Autonomous
  - Systemic

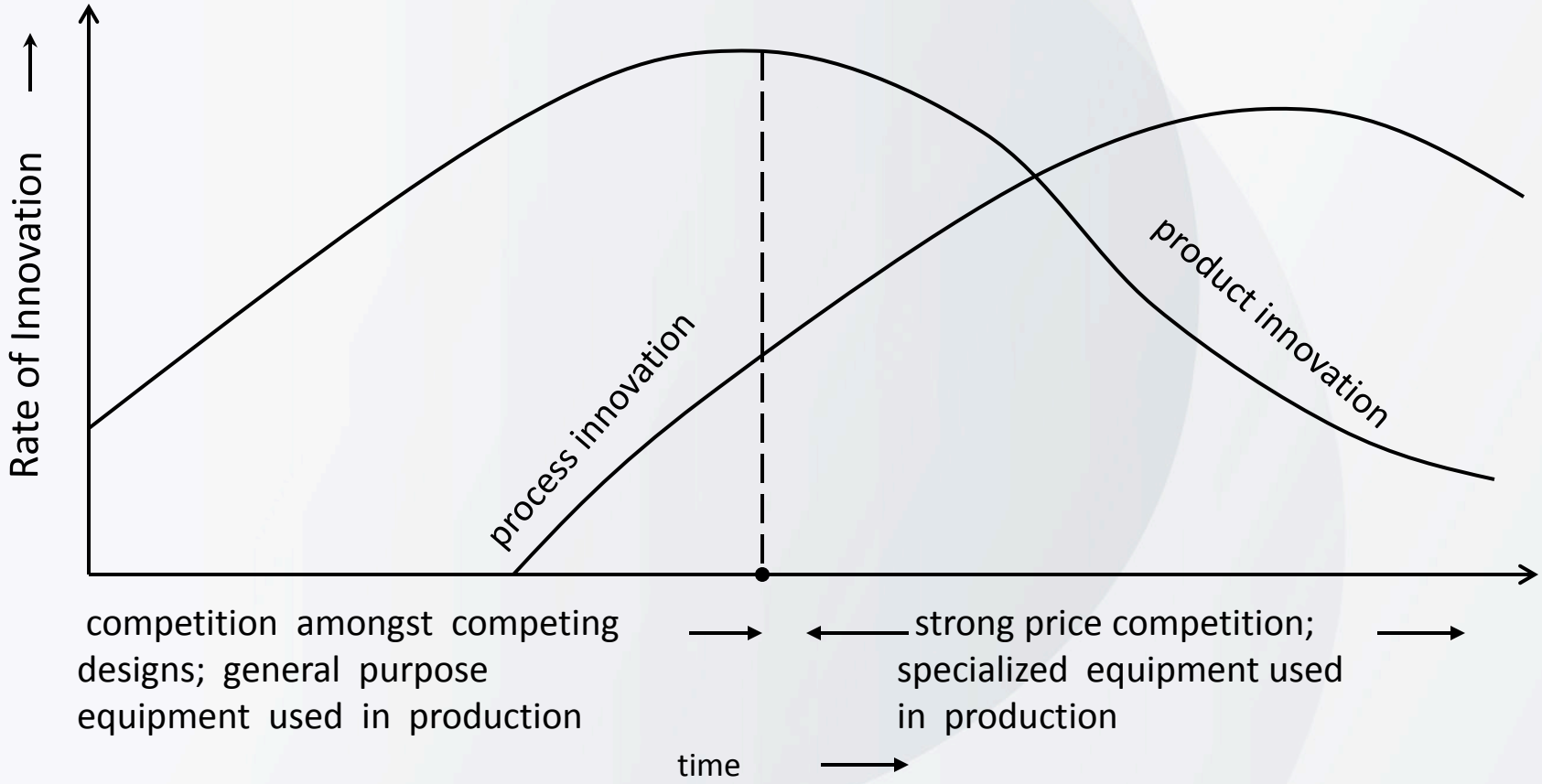
Components of Industrial Knowledge



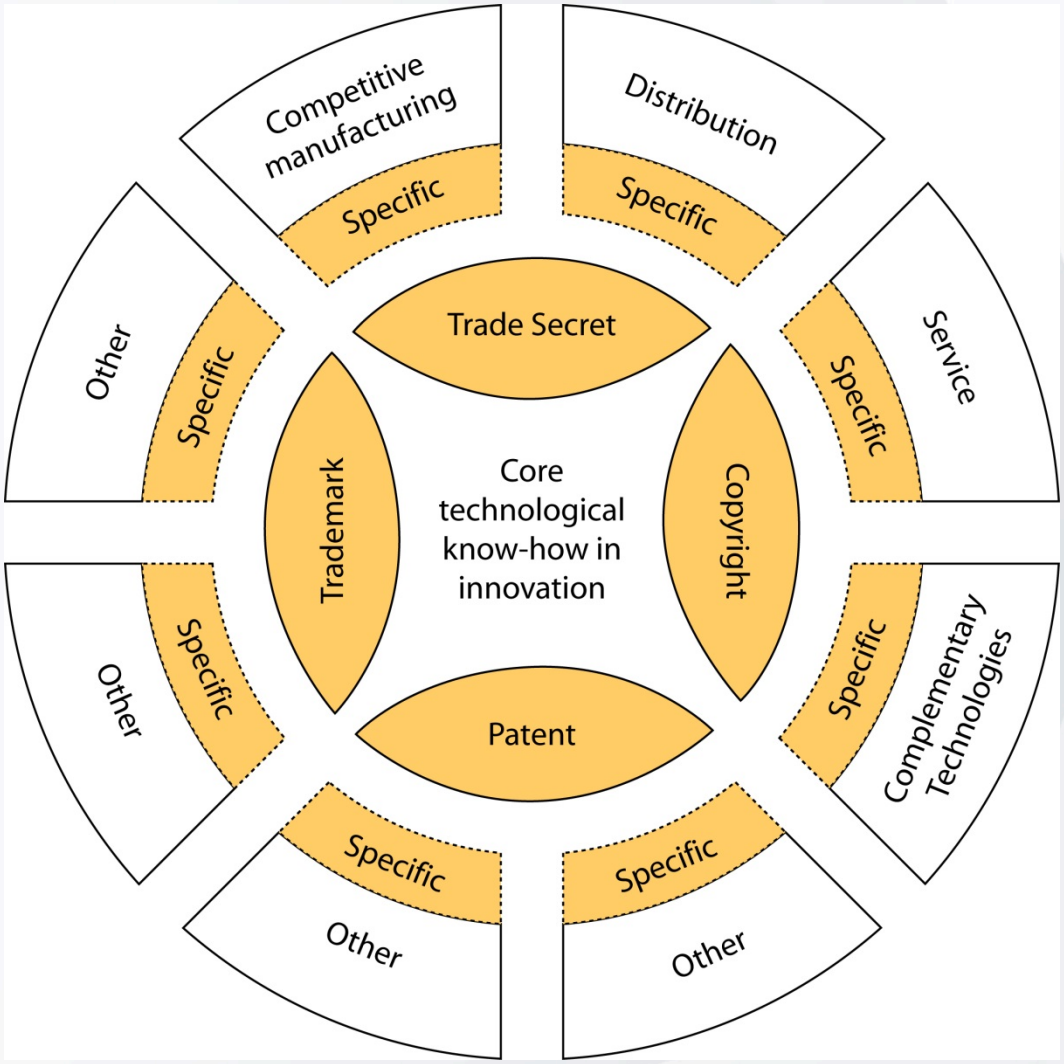
Appropriability Regimes for Knowledge Assets

Intellectual property rights	Inherent replicability: Easy	Inherent replicability: Hard
Loose	Weak appropriability	Moderate appropriability
Tight	Moderate appropriability	Strong appropriability

Innovation over the product/industry life cycle

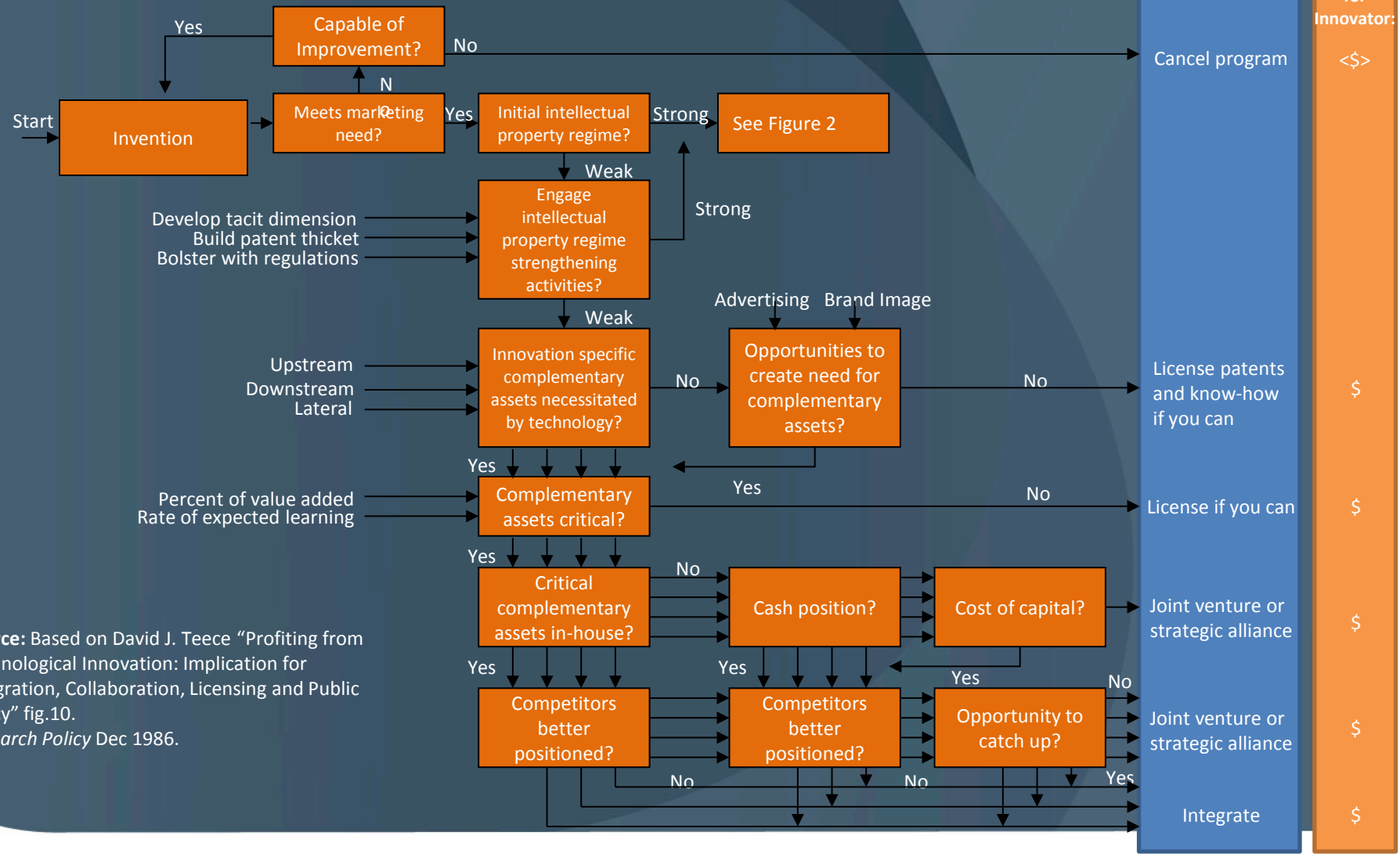


Representative Complementary Assets Needed to Commercialize Innovation



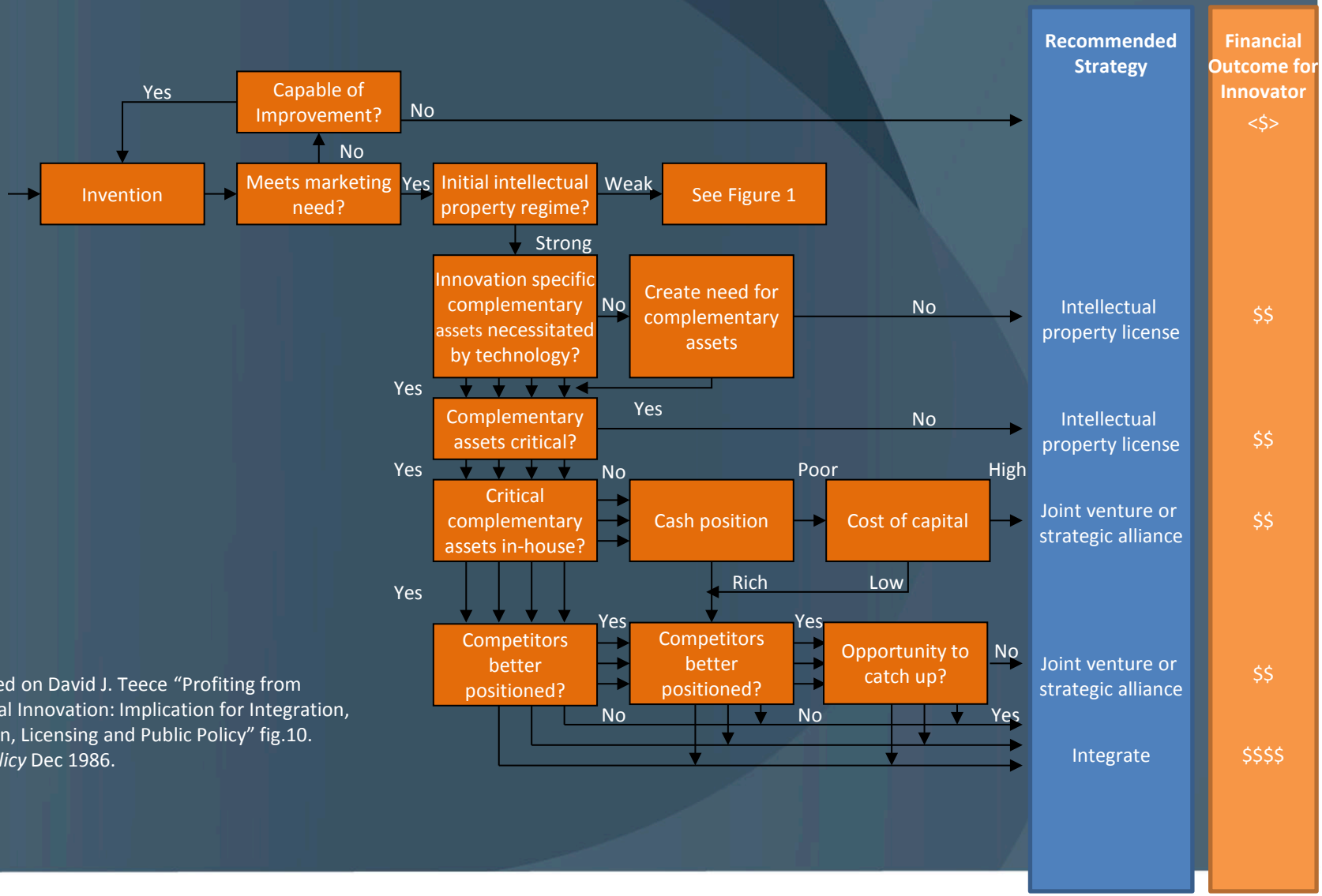
Colored area represents the less imitable portion of the value chain. Outer segments represent complementary assets; inner circle segments represent know-how.

Strategies for deploying knowledge assets: weak appropriability case



Source: Based on David J. Teece "Profiting from Technological Innovation: Implication for Integration, Collaboration, Licensing and Public Policy" fig.10.
Research Policy Dec 1986.

Strategies for deploying knowledge assets: strong appropriability scenario



Source: Based on David J. Teece "Profiting from Technological Innovation: Implication for Integration, Collaboration, Licensing and Public Policy" fig.10. *Research Policy* Dec 1986.

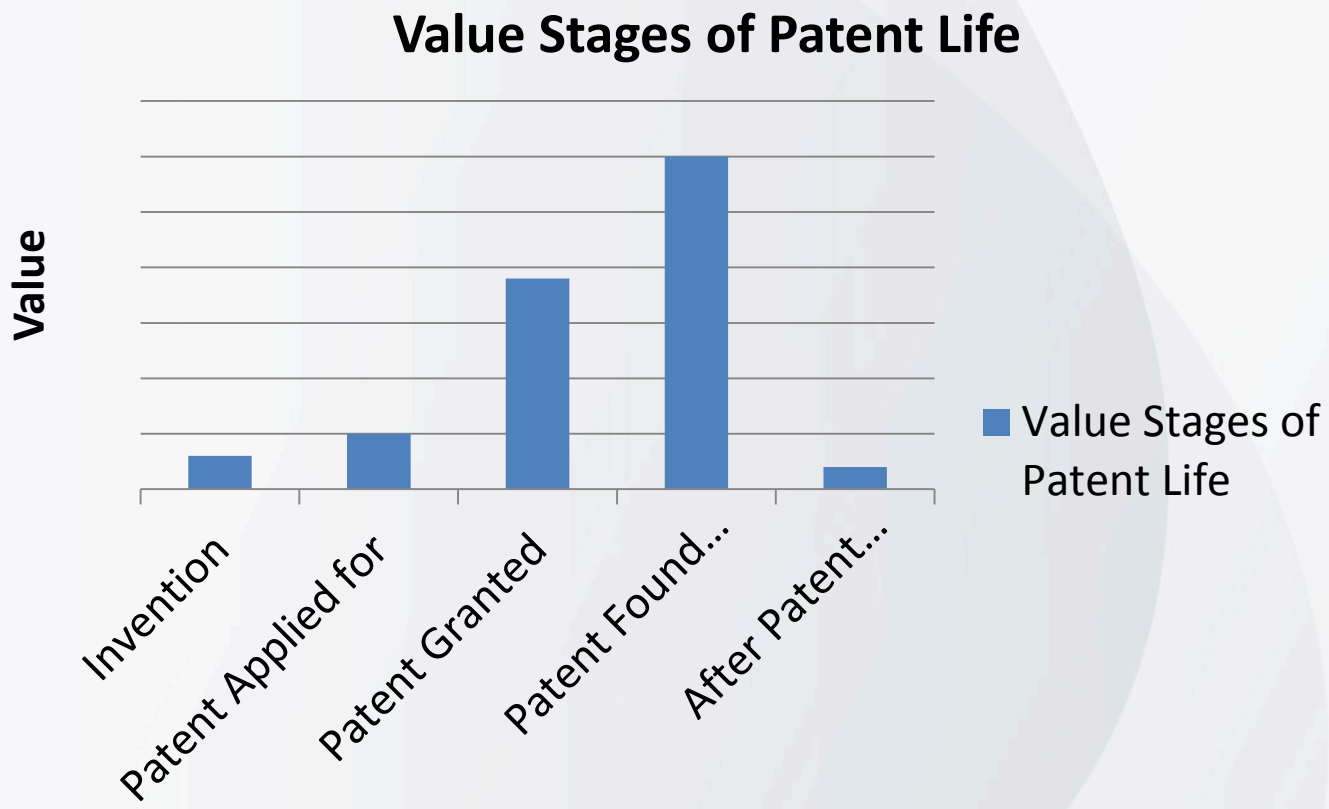
Contract and integration strategies and outcomes for innovators: Specialized asset case

	Strong Legal/Technical Appropriability	Weak Legal/Technical Appropriability: Innovator Excellently Positioned versus Imitators with Respect to Complementary Assets	Weak Legal/Technical Appropriability: Innovator Poorly Positioned versus Imitators with Respect to Complementary Assets
Innovators and imitators advantageously positioned (vis a vis independent owners of complementary assets)	Contract → Innovator will win	Contract → Innovator should win	Contract → Innovator or imitator will win; asset owners won't benefit
Innovators and imitators disadvantageously positioned (vis a vis independent owners of complementary assets)	Contract if can do so in competitive terms; integrate if necessary → Innovator should win; may have to share profit with asset holders	Integrate → Innovator should win	Contract (to limit exposure) → Innovator will probably lose to imitators and/or asset holders

Calibrating the Strength of Patent Protection

- Length: How much time left to run?
- Breadth: Range of products covered?
- Validity: Likelihood of being upheld if challenged
- Exclusionary power: Can the owner refuse to license without raising antitrust or other issues
- Available remedies: If patent infringed

Value and Stages of Patent Life



Other Elements of Appropriability Regimes

- Other IP (trade secrets, copyright)
- Complimentary Assets
- Lead time to market (first mover)
- Learning curve cost advantage

Complementary IP and the Fallacy of "One Patent, One Product" Thinking

- All innovators "stand on the shoulders" of others
- Important distinctions between:
  - Complex v. discrete technology
  - Discrete/autonomous may have just one patentable element

Importance of Bulk Licensing and Cross-Licensing

- Bulk/package licensing and/or cross-licensing are important (and justified) when innovation is systemic too costly to license patents one at a time
- Cannot test all patents against all products
- Not practical to condition royalties on a product-by-product,
- Patent-by-patent basis achieves design freedom and freedom to operate

"Patent Thickets"

- Patent thickets may or may not map to "technology thickets"
  - Numerous patent grants may reflect numerous technological breakthroughs
  - Whether patent thickets are desirable or undesirable depends on whether or not they are undergirded by technology thickets

Intangible property and tangible property: Good policy requires intelligent carry over

- Once the duration of patents and copyrights is taken into account, the carry over should be encouraged
- Intangible property, not just intellectual property, to embrace the airways (electromagnetic spectrum) and the internet
- While there are significant differences between tangible and intangible property, there are “tight logical and functional resemblances” (R. Epstein)
- State action was needed to access networks created by nature e.r. rivers, coast, hills

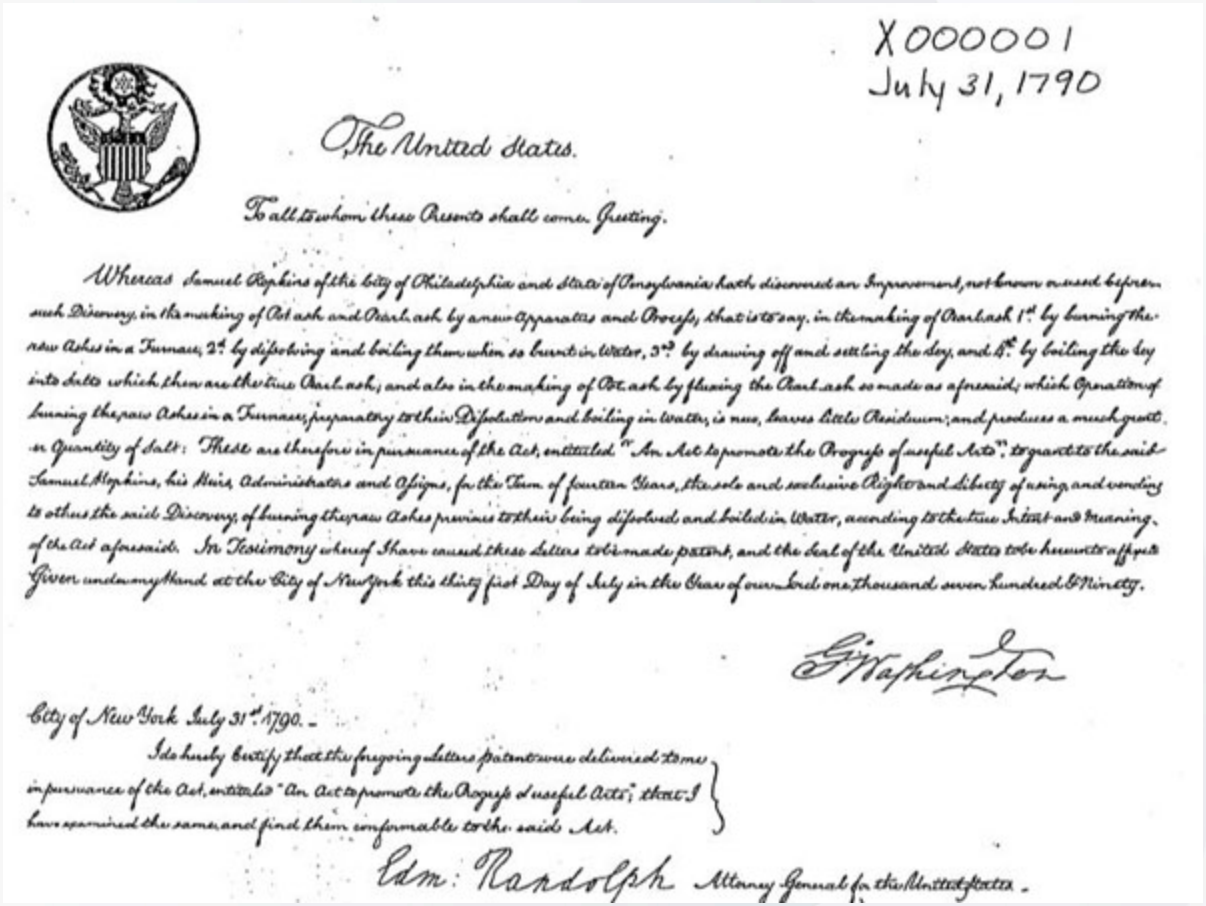
Similarities and differences

Intangible	Tangible
Scope very fuzzy boundaries of patents	Crisp boundaries for patents
Mildly fuzzy boundaries for copyright	Perpetual rights
Disposition of misused trade secrets (transfer of knowhow is irrevocable)	Eviction available remedy as a

Inherent Tradability of Different Assets

Characteristics	Know-how / IP	Physical commodities
Recognition of trading opportunities	Inherently difficult	Inherently easy
Disclosure of attributes	Relatively difficult	Relatively easy
Property rights	Limited (patents, trade secrets, copyright, etc.)	Broad
Property boundaries	Often fuzzy	Generally sharp
Item of sale	License	Measurable units
Variety	Heterogeneous	Homogeneous
Unit of consumption	Often unclear	Weight, volume, etc.
Inherent tradeability	**Low**	**High**

The first patent



X000001
July 31, 1790

The United States.

To all to whom these Presents shall come. Greeting.

Whereas Samuel Hopkins of the City of Philadelphia and State of Pensylvania hath discovered an Improvement, not known or used before such Discovery, in the making of Pot ash and Pearl ash by a new Apparatus and Process, that is to say, in the making of Pearl ash 1st. by burning the raw Ashes in a Furnace, 2d. by dissolving and boiling them when so burnt in Water, 3rd. by drawing off and settling the ley, and 4th. by boiling the ley into salts which then are the true Pearl ash; and also in the making of Pot ash by fluxing the Pearl ash so made as aforesaid; which Operation of burning the raw Ashes in a Furnace, preparatory to their Dissolution and boiling in Water, is new, leaves little Residuum; and produces a much greater Quantity of salts: These are therefore in pursuance of the Act, entitled "An Act to promote the Progress of useful Arts", to grant to the said Samuel Hopkins, his Heirs, Administrators and Assigns, for the Term of fourteen Years, the sole and exclusive Right and Liberty of using, and vending to others the said Discovery, of burning the raw Ashes previous to their being dissolved and boiled in Water, according to the true Intent and Meaning of the Act aforesaid. In Testimony whereof I have caused these Letters to be made patent, and the Seal of the United States to be hereunto affixed. Given under my Hand at the City of New York this thirty first Day of July in the Year of our Lord one thousand seven hundred & Ninety.

G. Washington

City of New York July 31st 1790.

I do hereby certify that the foregoing Letters patent were delivered to me in pursuance of the Act, entitled "An Act to promote the Progress of useful Arts", that I have examined the same, and find them conformable to the said Act.

Edm: Randolph Attorney General for the United States.

Ambivalence about patents

Some economists are ambivalent about patents because of the so called monopoly feature or patents, but:

1. A patent, while sometimes providing control of elements of a technology, very rarely confers monopoly over a market
2. Absent control over a market, there is no market power (i.e. meaningful monopoly power)
3. Complementary assets and technologies are almost always needed to launch innovative products – this increases the difficulty of extracting excess profits
4. Patents favor systematic innovation based competition

Inadequate IP system slows innovation in China

"Another result of China's inadequate system of property rights and legal enforcement is the disincentive it creates for investing in R&D and pursuing cooperative inter-organizational, network-based strategies."

"Free riding, possibly under a weak intellectual property rights regime, clearly reduces the incentive…to invest in R&D…the patent system and intellectual property rights protection in general has an important effect on primary actors' motivation to innovate, and the government must continue to refine it…."

Source: X. Liu and S. White, *Research Policy*, 2001

Inadequate IP system slows innovation in China

"Intellectual property…just one component of any 'natural system of innovation'." (R.R. Nelson

Developing a western style natural system of innovation may not be viable or even desirable…only China will know.

But since innovation is globally dispersed, no one nation can monopolize it. China must figure out how to engage vigorously with other national systems, and vice versa.

The growing emphasis on intangibles will require a more positive approach to intellectual property, otherwise China will remain trapped as a follower/imitator, and deny itself the chance of being the pioneer.