Innovation and IP
Europe at a crossroads

- US / EU economies are similar in size
- US > EU equity by 2x; 14x when it comes to VC (21x seed; 8x later stage)
- US > EU debt by 3x
- Situations differ widely between EU Member States
- EU has fragmented markets
- The problem is particularly acute for SMEs
- US has structural advantages: 1945 exclusion from Trade agreements + key European technologies neutralised
- Cultural aspects. Risk appetite. 33% of US SME financing comes from individuals vs. 9% in EU

Public funding and subsidiarity

- EU Public Funding supported by innovation is mostly national
  Eg.
  - EU Framework programme 90/10
  - However much more in terms of marginal spending → disproportionate influence on research topics
  - Basic flaws : apply now to fund future programmes
  - Bureaucracy : Control

European technology angelism

- Post-1945 Structural Disadvantages
  - US Post – 1945 Exemptions
    - Eg. SMEs in Public Procurement
  - Key Technologies
    - Eg. Radar, Cryptography, Brain exodus
  - Foremost: EU Fragmentation
- EU as US / Asia incubator ?

Technology dynamics and waves

- Europe is static, rule-based : disruptive inventions by definition fall outside rules – impose new paradigms
- Lacks a sense of technology dynamics / timing / cycles
- GSM, graphene, Galileo
- Digital strengths: share, live together (Balablacar, airbnb)

IP Leakages are crippling

- EU Patent: Lost time → in the end did we get the right patent system?
- IP and Bankrupcies
- The Finnish play it right : See Nokia
- Other EU leaders
  - L'Oreal
  - Phillips
  - KU Leuven

IP : Crippled innovation

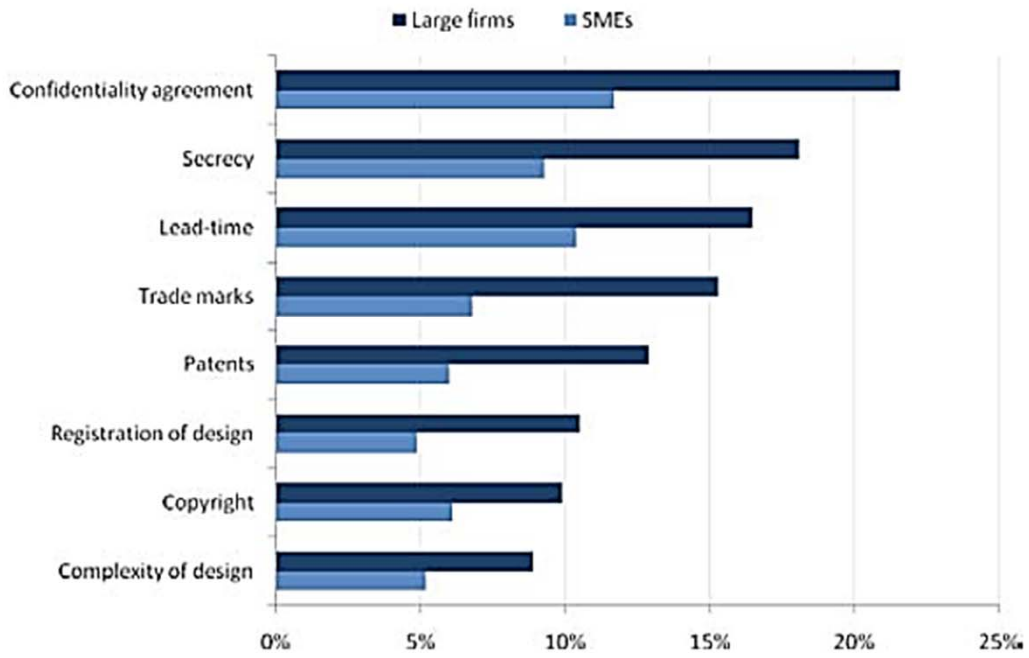
- Brands - OK
- Copyrights / coding – Ok
- Patents are the main problem
- It is a dog eat dog world out there: secrecy is on the rise

Patents increasingly used for signaling / Tech partnerships
Identification – Protection
Incumbents

Different means to secure innovation

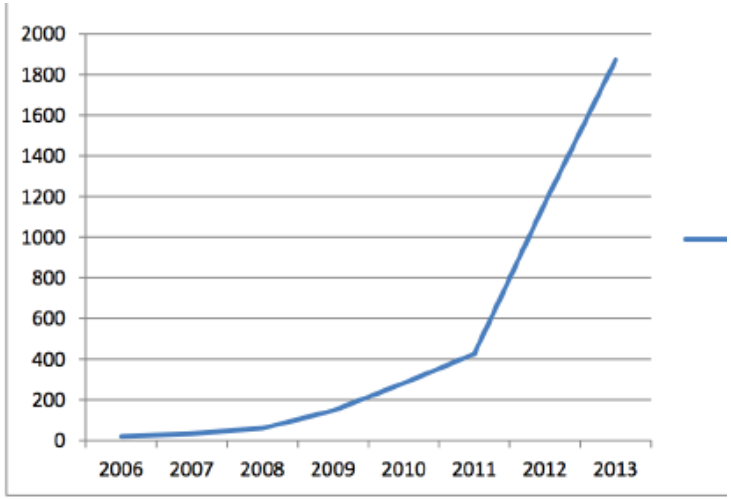
- **Patent (design, utility model, plant)**
- **Copyright/software**
- **Trade secret**

Figure 2.1 Protecting innovation: techniques preferred by UK Firms



Source: Hughes and Mina (2010), from UK Innovation Survey

Evolution of Google filed US patents
Revelation of IPR usefulness



+ acquisition of 20 000 Motorola patents for 12,5 Bn$ in 2012

Mean Percentage of Product Innovations for which Mec					
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Industry	N	Secrecy	Patents	Other Legal	Lead Time
Miscellaneous Chemicals	29	70.69	39.66	25.52	55.52
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Communications Equipment	34	47.21	25.74	20.15	65.59
Glass	6	46.67	30.83	11.67	50.00
Mineral Products	18	46.11	21.11	12.22	39.72
Special Purpose Machinery	64	45.08	48.83	23.05	59.69
Concrete, Cement, Lime	10	45.00	30.00	17.50	38.00
Computers	25	44.20	41.00	27.20	61.40
Metal Products	44	43.07	39.43	18.18	48.18
Car & Truck	9	42.22	38.89	19.44	65.56
Electrical Equipment	22	39.09	34.55	15.00	33.41
Steel	10	37.00	22.00	11.50	61.50
Electronic Components	26	34.04	21.35	20.19	45.58
Printing & Publishing	12	32.50	12.08	21.67	48.33
ALL	1118	51.00	34.83	20.71	52.76

why small firms choose non-patent mechanisms to protect innovations:

- *"High enforcement costs (74%)*
- *Competitors can legally invent around most patents (72%)*
- *Portfolio of patents is too expensive to maintain (61%)*
- *Rapid changes in technology limit patent protection (57%)"*

Another well-known study of appropriability mechanisms was conducted by *Cohen et al. (2000*). The authors analysed the responses of a survey questionnaire sent to 1,478 R&D labs in the US manufacturing sector in 1994.

Les deux faces de Janus

Double nature of patents

- IP as Protectionism. Eg. Venice. OECD discussions today
- IP as Vector of Innovation / common good. Eg. Enligthenment ; US Constitution
- Patent inflation – inventive steps
- Offices are conflicted

Crystallization and debate during the 19th century

Patent system is born in Renaissance Italy. First patent law : **Venice 1474**
Royal privilege and Mercantilist vision (**reward, attract skills, protect local, substitute imports**) : The **British** statute of monopoly of 1623, Patentes royales in mid 16th century in **France**.
France patent law of 1791 consider intellectual property **a natural right of individual** as any other type of property and has a strong influence among European countries and Latin America.

In the **US the constitution of 1787** states « *The Congress shall have the power… to promote the progress of science and useful Arts by securing for a limited time to authors and inventors the exclusive rights to their respective writings and discoveries* ». Patent act of 1790. Creation of the USPTO in 1836.

German states adopt laws early in the century (Prussia 1815), then it was adopter a single law for the entire Zollverein in 1842, and in 1877 for the Reich. Creation of the Deutche Patentamt (Patent Office) in 1891.

In **Japan** successive laws were decided and withdraw : 1871, 1885, 1899, 1920…
Essential concepts were introduced during this time : quality of patent, first to invent/fist to file, grace period, compulsory licence if reasonable conditions are offered, judge control

Patent controversy was however very vivid about the effect on progress (« un outrage à la liberté et l'industrie », M. Chevalier (French economist), and even drove to the abolition of the Dutch patent system in 1869.
But this controversy faded after 1875 for three reasons: the continuous expansion of patent system in a growing number of countries, a growing number of inventions filed in industrial innovation domains (T. Edison filed mote than 1000 patents) international pressure for harmonization of the patent systems.

Maturity : international harmonization 19th- 20th century

Century of trade expansion and international expositions drive to the **Paris Convention of 1883**, joined by UK in 1884, US in 1887, Germany in 1903 : **national treatment** where foreigner are treated the same way as they are nationals (< reciprocity) / **priority application** (worldwide protection during one year).

Creation of WIPO in 1967 (Paris Convention has been revised six time and integrated in the UN system).

The **Patent Cooperation Treaty was signed in 1970** and implemented in 1978. PCT offers an **international patent examination procedure** which allows to file one application before WIPO.

Integration in the GATT/WTO system with the **TRIPS** (Trade related IP) **agreement in 1994**
Harmonization of national administrative procedure by the **Patent Law Treaty** (PLT) of 2004.

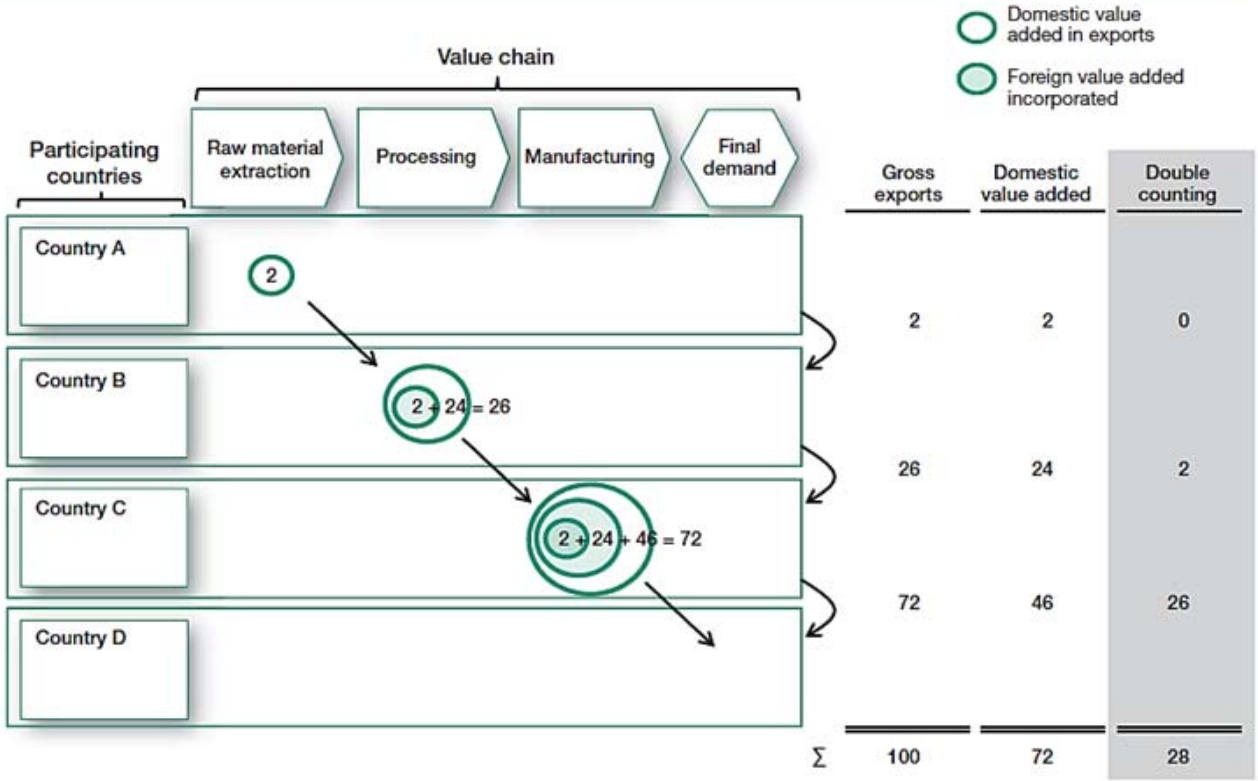
Europe : **creation of EPO in 1973. On going adoption of unitary patent and the unitary court of justice?**

Global value chains

The transformation of industrial processes: the globalization of the value chain

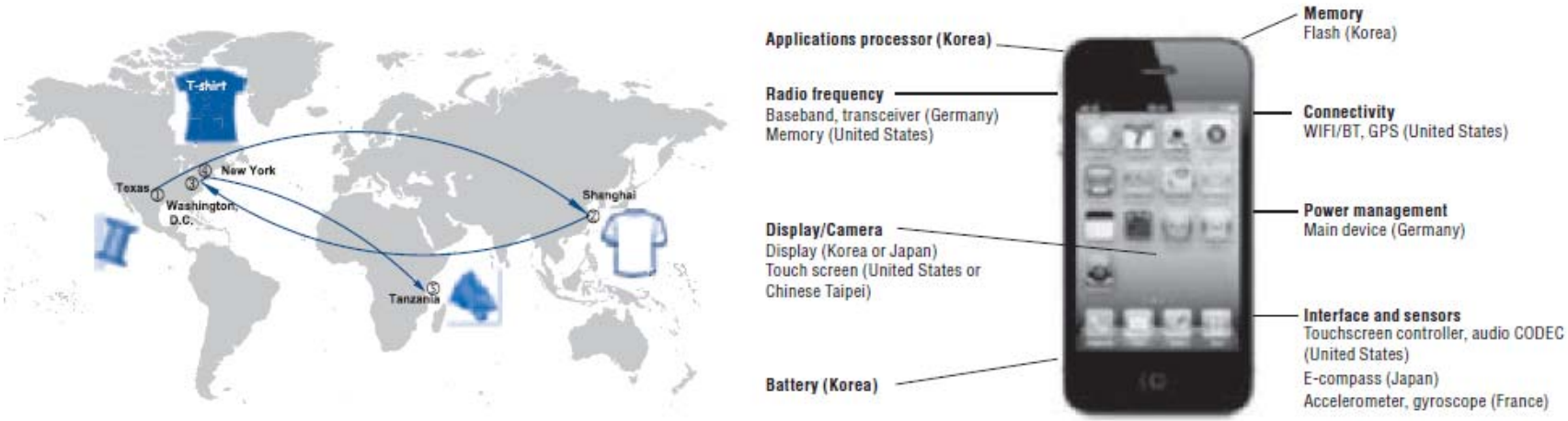
- ***On average worldwide, the import content of a product has risen from 20% 20 years ago to 40% today and is expected to reach 60% in 20 years*** *(Pascal Lamy).*
- ***"Many of our most used goods and services are "made in the world". The foreign content of "Korean" and "Chinese" electronic goods exported in 2009, for example, was around 40%*** (Oxford Martin report)

Figure IV.1. Value added trade: how it works



Source: UNCTAD.

Figure 1.2. Global value chains: From apparel to electronics



OECD (2013), *Interconnected Economies: Benefiting from Global Value Chains*, OECD Publishing. *http://dx.doi.org/10.1787/9789264189560-en*

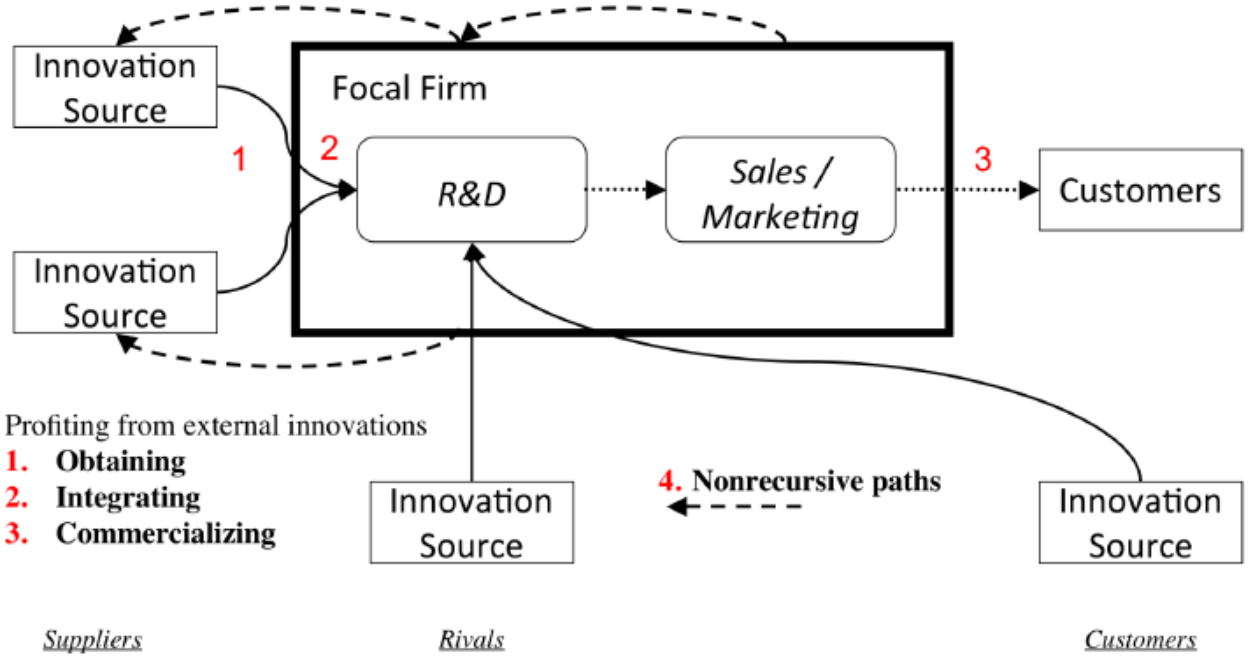
The rise of knowledge networks and markets (KNMs) as enablers of open innovation : the example of life sciences (OECD)

KNMs include a broad range of existing initiatives whose purpose is to improve access to widely distributed biomedical knowledge resources in order to facilitate further innovation. **The goal is to improve the circulation (sharing, trading or joint production) of disembodied knowledge (inventions, IPR, software, data, know-how) between independent parties using various vehicles** (commercial transactions like licensing, spillovers, joint facilities, special interfaces, individual mobility, mergers and acquisitions, direct investment). The purpose of a knowledge network or market thus is to foster the more efficient use of knowledge and to enable cumulative innovation.

Examples of collective systems (*i.e.* KNMs) for innovation in the biosciences

- **Data registries and repositories :** *e.g.* NIH GenBank, The Cancer Genome Atlas, Global Biological Resources Centre Network (GBRCN). Virus Pathogen Bioinformatics Resource Centre, Patients-like-me.com
- **Platform technologies and tools :** *e.g.* Sage Bionetworks, BioBricks foundation, GSK medicines for malaria platform
- **Consortia and public-private partnerships :** *e.g.* Innovative Medicines Initiative, Biomarkers Consortium
- **Pools, clearinghouses and exchanges :** *e.g.* GSK Neglected Tropical Diseases pool
- **Prizes, on-line auctions, brokers and citizen science :** *e.g.* Innocentive, Prize4Life, Foldit

A four-phase process model for inbound open innovation

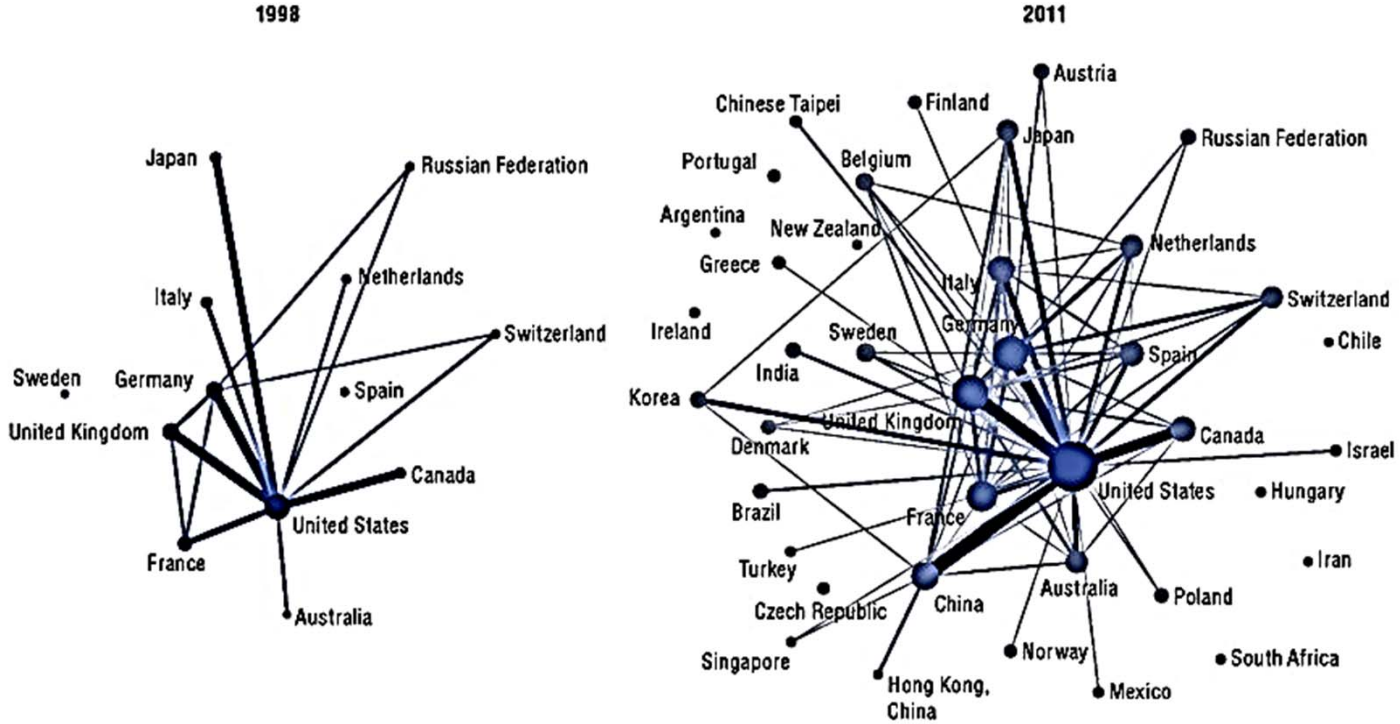


West, Joel and Bogers, Marcel, "Profiting from External Innovation: A Review of Research on Open Innovation," September 13, 2011

Academics' collaboration

Figure 1.27. **International collaboration networks in science**

Internationally co-authored documents, 2011 and 1998 (whole counts)



Note: The position of selected economies (nodes) exceeding a minimum collaboration threshold of 10 000 documents is determined by the number of co-authored scientific documents published in 2011. A visualisation algorithm has been applied to the full international collaboration network to represent the linkages in a two-dimensional chart on which distances approximate the combined strength of collaboration forces. Bubble sizes are proportional to the number of scientific collaborations in a given year. The thickness of the lines (edges) between countries represents the intensity of collaboration (number of co-authored documents between each pair). The positions derived for 2011 collaboration data have been applied to 1998 values. New nodes and edges appear in 2011 as they exceed the minimum thresholds.

Source: OECD (2013), OECD *Science, Technology and Industry Scoreboard 2013: Innovation for Growth*, OECD Publishing, Paris, *http://dx.doi.org/10.1787/sti_scoreboard-2013-en*; Based on Elsevier (2012), *Scopus Custom Data*, version 5.2012, June 2013.

Table 6: Most populated migration corridors, 2006-10

Largest inventor migration corridors			Largest inventor migration corridors (excluding the US)		
Origin	Destination	Inventors	Origin	Destination	Inventors
China	United States of America	27,698	Germany	Switzerland	4,949
India	United States of America	21,712	France	Switzerland	1,879
Canada	United States of America	11,363	France	Germany	1,492
United Kingdom	United States of America	8,314	China	Japan	1,462
Germany	United States of America	5,894	Germany	Netherlands	1,332
Germany	Switzerland	4,949	Austria	Germany	1,307
Republic of Korea	United States of America	4,876	France	United Kingdom	1,210
France	United States of America	3,901	China	Singapore	1,149
Japan	United States of America	2,843	Germany	Austria	1,107
Russian Federation	United States of America	2,308	United Kingdom	Germany	1,080
France	Switzerland	1,879	Netherlands	Germany	1,049
Israel	United States of America	1,875	United States of America	China	1,041
Australia	United States of America	1,783	Germany	United Kingdom	969
Netherlands	United States of America	1,670	Italy	Germany	956
Italy	United States of America	1,492	Italy	Switzerland	955
France	Germany	1,492	France	Belgium	934
China	Japan	1,462	Germany	France	916
Germany	Netherlands	1,332	United Kingdom	Switzerland	887
Austria	Germany	1,307	United States of America	Germany	820
Turkey	United States of America	1,233	United States of America	Canada	807

Back to the middle ages? Inventors' corridors rather than clusters?

Figure 2: Immigration rates of inventors by type of applicant: business, university, research/government, and individual, 2006-10

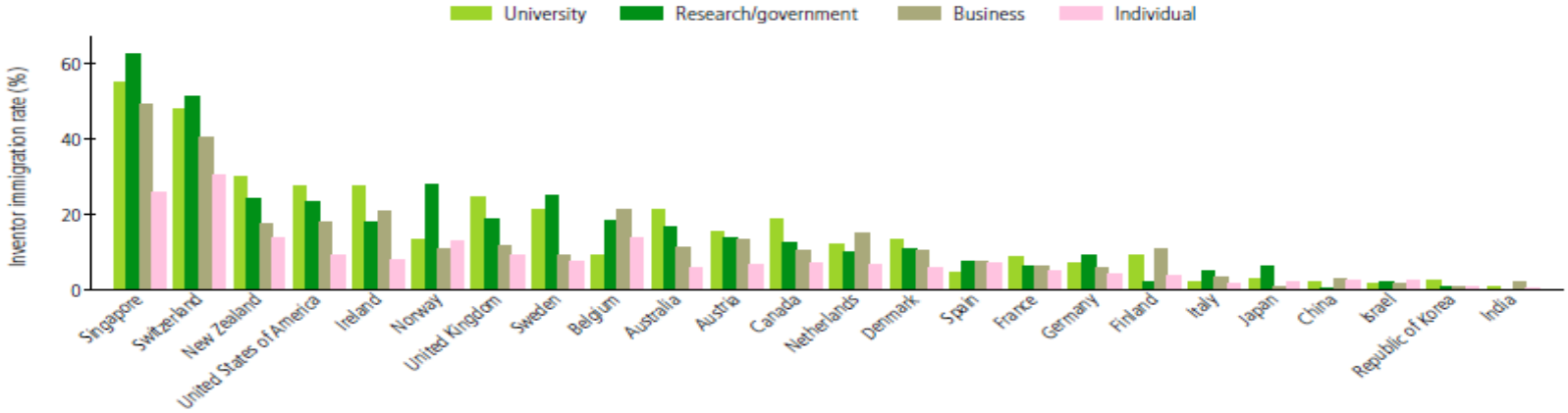
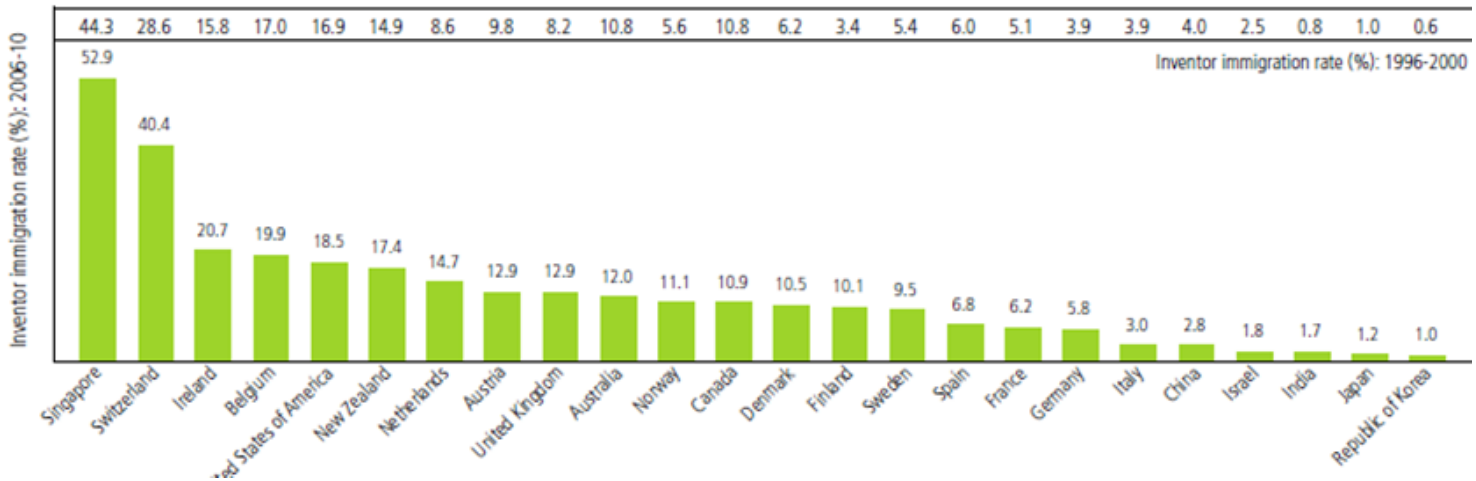


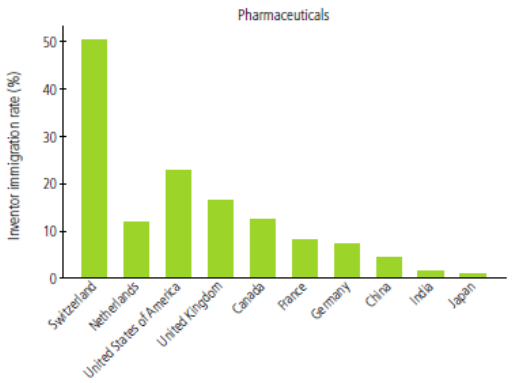
Figure 1: Inventor immigration rates for the largest receiving countries, 2006-10

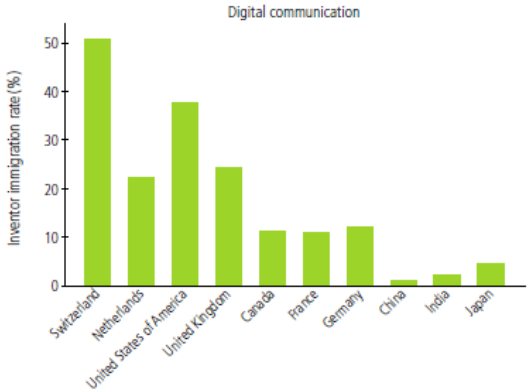


Do regions play a role in attracting talent?

One striking aspect of immigration, and particularly skilled immigration, is that migrants tend to concentrate in specific geographical areas within countries. For example, the share of skilled foreign-born individuals in the UK and France in 2000 was estimated at 8.8% and 9.8%, respectively; in contrast, 28% of London residents and 23% of Paris residents were foreign-born (Freeman 2006). In particular, immigrant inventors appear to cluster in metropolitan areas, thus contributing to the spatial concentration of inventive activity.

Wipo, 2011 report





Applicant's name	Immigration rate (%)	Applicant	Inventor
United States of America			
QUALCOMM INCORPORATED	50.8	6,528	19,907
MICROSOFT CORPORATION	57.4	3,020	11,297
3M INNOVATIVE PROPERTIES COMPANY	11	2,577	8,852
HEWLETT-PACKARD DEVELOPMENT COMPANY, L.P.	18.6	2,360	6,114
E.I. DUPONT DE NEMOURS AND COMPANY	17	2,118	5,916
INTERNATIONAL BUSINESS MACHINES CORPORATION	21.4	2,006	6,854
UNIVERSITY OF CALIFORNIA	28.2	1,754	5,598
MOTOROLA, INC.	23.4	1,573	4,488
PROCTER & GAMBLE COMPANY	10.2	1,540	4,953
BAKER HUGHES INCORPORATED	12.8	1,461	3,552
France			
CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE (CNRS)	8	1,892	7,002
COMMISSARIAT A L'ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES	2.6	1,514	4,240
RENAULT S.A.S.	0.2	1,065	2,357
FRANCE TELECOM	11.6	963	2,188
L'OREAL	1.8	849	1,730
PEUGEOT CITROEN AUTOMOBILES SA	2.4	772	1,502
THALES ULTRASONICS SAS	0.4	626	1,473
INSTITUT NATIONAL DE LA SANTE ET DE LA RECHERCHE MEDICALE (INSERM)	9.2	517	1,633
ARKEMA	3.4	506	1,279
L AIR LIQUIDE SOCIETE ANONYME POUR L'ETUDE ET L'EXPLOITATION DES PROCEDES GEORGES CLAUDE	5	471	1,332
China			
ZTE CORPORATION	0.2	7,551	17,803
HUAWEI TECHNOLOGIES CO., LTD.	0.8	7,277	18,858
HUAWEI DEVICE CO., LTD.	0.2	570	1,372
TENCENT TECHNOLOGY (SHENZHEN) COMPANY LIMITED	0	419	1,014
ALCATEL SHANGHAI BELL CO., LTD.	0.4	380	1,095
CHINA ACADEMY OF TELECOMMUNICATIONS TECHNOLOGY	2	317	1,002
BYD COMPANY LIMITED	0	263	1,015
TSINGHUA UNIVERSITY	0.2	242	1,571
PEKING UNIVERSITY	0.2	215	818
DA TANG MOBILE COMMUNICATIONS EQUIPMENT CO., LTD.	0.6	205	688

Table 4: Inventor immigration rates by technology field, 2006-10

Field of technology	Immigration rate (%), 1996-2000	Immigration rate (%), 2006-10
Electrical engineering		
Electrical machinery, energy	5.2	7.2
Audio-visual technology	6.2	9.5
Telecommunications	7.5	11.9
Digital communication	9.7	15.2
Basic communication processes	9.2	16.0
Computer technology	9.6	13.4
IT methods for management	8.0	10.5
Semiconductors	7.0	12.1
Instruments		
Optics	6.5	7.9
Measurement	7.0	9.8
Analysis of biological materials	13.9	13.8
Control apparatus	5.3	7.0
Medical technology	6.9	8.3
Chemistry		
Organic fine chemistry	9.3	13.9
Biotechnology	16.5	14.6
Pharmaceuticals	11.3	14.6
Macromolecular chemistry, polymers	7.2	10.2
Food chemistry	7.9	11.2
Basic materials chemistry	7.6	11.4
Materials metallurgy	5.7	7.7
Surface technology, coating	5.9	8.1
Micro-structure and nano-technology	13.0	18.3
Chemical engineering	6.5	9.0
Environmental technology	4.6	7.3
Mechanical engineering		
Handling	4.5	5.1
Machine tools	3.6	4.6
Engines, pumps, turbines	4.4	6.1
Textile and paper	5.1	6.8
Other special machines	5.0	6.4
Thermal processes and apparatus	4.3	5.2
Mechanical elements	3.8	4.1
Transport	3.9	4.3
Other fields		
Furniture, games	4.7	5.0
Other consumer goods	5.4	5.3
Civil engineering	4.4	7.7

Figure 1.5. **Different types of innovation networks**

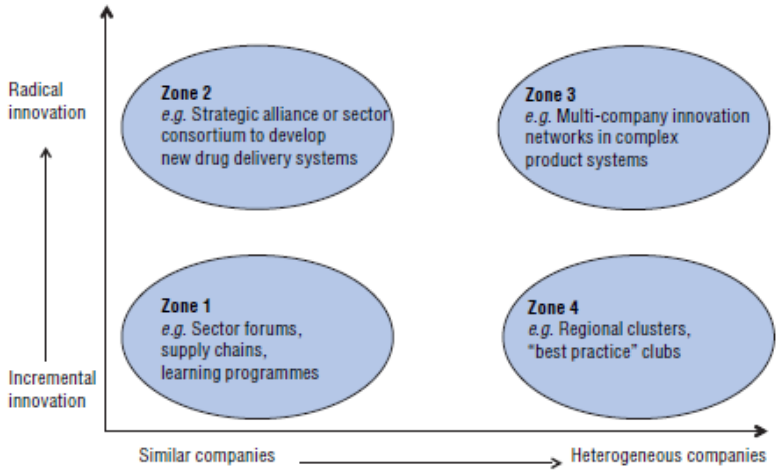


Figure 1.7. **Open innovation modes: technology and markets**

MARKETS	Core	Non-core	Unfamiliar
Unfamiliar	Joint venture Contract R&D	Venture capital Internal venture fund	Spin-off Sell
Non-core	Joint development Acquisition	Licensing Equity stake	Venture capital Internal venture fund
Core	Acquisition Internal development	Internal development Licensing Acquisition	Joint venture Contract R&D
	Core	**Non-core**	**Unfamiliar**
		TECHNOLOGY	

Source: Adapted from EIRMA (2004).

Source : oecd, open innovation

The relationship between migration and innovation has become a major focus of research by academics and policymakers alike. The key factor driving this development is the observation that high-skilled migrants decisively contribute to innovation outcomes, to the international diffusion of knowledge and, ultimately, to the economic growth of nations.
In some of the largest migrant-receiving countries (e.g.,the United States of America (US)), immigrants are overrepresented among the most skilled workers. While immigrants account for about 12% of the entire US labor force,they account for 25% of US scientists and engineers, 50% of US PhDs, 60% of post-doctoral students, and 26% of US-based Nobel Laureates (Black and Stephan, 2008; Kerr, 2009).

International mobility of inventors (PCT stat-wipo study) increasing mobility of trained engineers and scientists

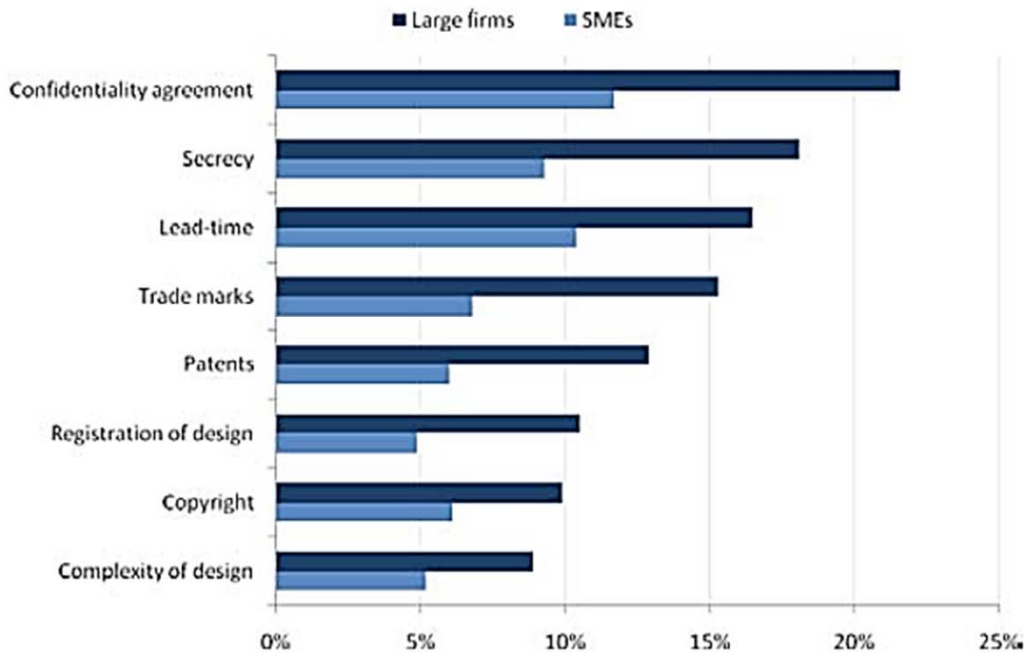
Table 2: Top 20 countries with the largest inventor immigrant and emigrant communities, 2006-10

Country	Immigrants	Share of world total (%)	Country	Emigrants	Share over world total (%)
United States of America	117,244	57.1	China	33,413	16.3
Germany	14,547	7.1	India	24,807	12.1
Switzerland	12,479	6.1	Germany	19,043	9.3
United Kingdom	9,113	4.4	United Kingdom	15,160	7.4
Netherlands	5,565	2.7	Canada	13,056	6.4
France	5,369	2.6	France	11,790	5.7
Singapore	4,334	2.1	United States of America	6,795	3.3
Canada	4,107	2.0	Republic of Korea	6,101	3.0
Japan	4,092	2.0	Italy	6,092	3.0
China	3,289	1.6	Netherlands	5,052	2.5
Sweden	3,204	1.6	Russian Federation	4,404	2.1
Belgium	3,173	1.5	Japan	4,029	2.0
Australia	2,441	1.2	Australia	3,212	1.6
Finland	1,969	1.0	Spain	3,085	1.5
Austria	1,905	0.9	Austria	2,775	1.4
Spain	1,590	0.8	Sweden	2,506	1.2
Denmark	1,520	0.7	Israel	2,252	1.1
Republic of Korea	1,188	0.6	Turkey	2,046	1.0
Italy	1,108	0.5	Belgium	1,932	0.9
Ireland	1,092	0.5	Greece	1,886	0.9
World	**205,446**	**100**	**World**	**205,446**	**100**

Different means to secure innovation

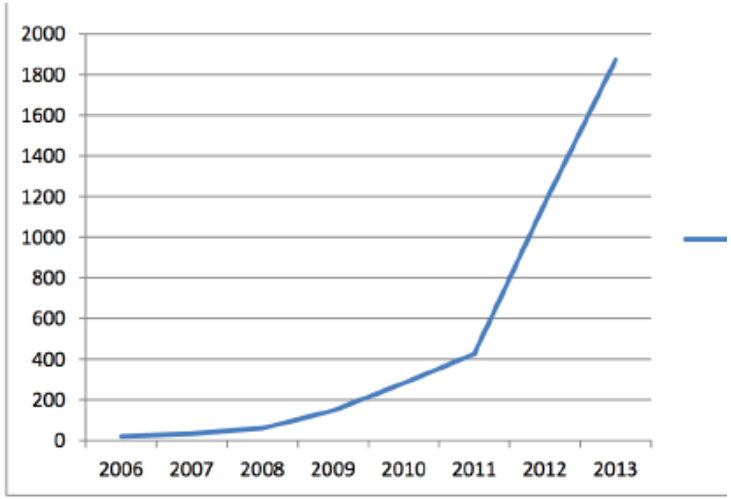
- **Patent (design, utility model, plant)**
- **Copyright/software**
- **Trade secret**

Figure 2.1 Protecting innovation: techniques preferred by UK Firms



Source: Hughes and Mina (2010), from UK Innovation Survey

Evolution of Google filed US patents
Revelation of IPR usefulness



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Food	89	58.54	18.26	21.18	53.37
Rubber & Plastic	35	56.86	32.71	10.14	40.86
Plastic Resins	27	55.93	32.96	18.15	38.33
Aerospace	48	55.10	32.92	16.15	58.02
Paper	31	55.00	36.94	26.45	47.10
Drugs	49	53.57	50.20	20.82	50.10
Chemicals	65	52.77	37.46	21.62	48.62
Medical Equipment	67	50.97	54.70	29.03	58.06
Motor & Generator	22	50.91	25.23	19.09	48.86
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Glass	6	46.67	30.83	11.67	50.00
Mineral Products	18	46.11	21.11	12.22	39.72
Special Purpose Machinery	64	45.08	48.83	23.05	59.69
Concrete, Cement, Lime	10	45.00	30.00	17.50	38.00
Computers	25	44.20	41.00	27.20	61.40
Metal Products	44	43.07	39.43	18.18	48.18
Car & Truck	9	42.22	38.89	19.44	65.56
Electrical Equipment	22	39.09	34.55	15.00	33.41
Steel	10	37.00	22.00	11.50	61.50
Electronic Components	26	34.04	21.35	20.19	45.58
Printing & Publishing	12	32.50	12.08	21.67	48.33
ALL	1118	51.00	34.83	20.71	52.76

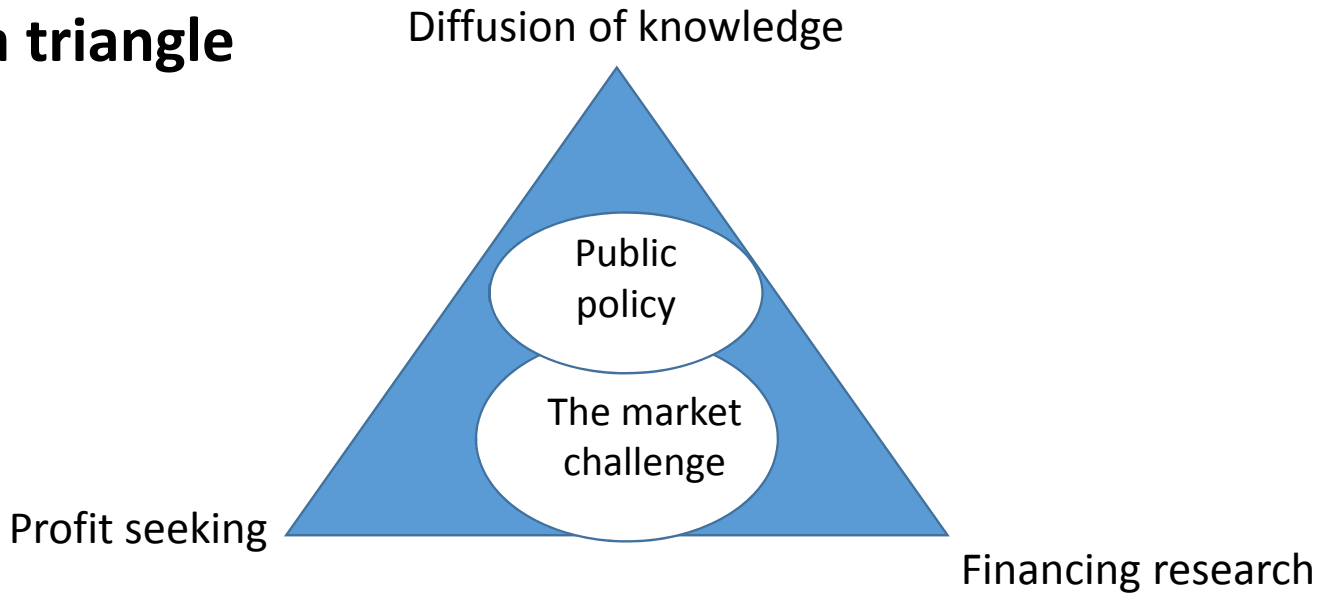
why small firms choose non-patent mechanisms to protect innovations:

- *"High enforcement costs (74%)*
- *Competitors can legally invent around most patents (72%)*
- *Portfolio of patents is too expensive to maintain (61%)*
- *Rapid changes in technology limit patent protection (57%)"*

Another well-known study of appropriability mechanisms was conducted by *Cohen et al. (2000*). The authors analysed the responses of a survey questionnaire sent to 1,478 R&D labs in the US manufacturing sector in 1994.

Is there a role in all this for public policy?

The dilemma triangle



Commercialization and open science are not necessarily irreconcilable and could instead be envisioned as complementary elements of a more holistic innovation framework Open science versus commercialization: a modern research conflict?Timothy Caulfield, Shawn HE Harmon and Yann Joly

- Facilitating the mobilization, sharing, or exchange of patents is increasingly important to promote innovation in this globalized and well-networked world, where the circulation of ideas and technologies is essential to innovation. In the context of open innovation, patents are expected to play a role as a means for transferring ideas and technologies from one entity to another" (Guellec, Yanagishawa, OCDE, 2009)

Government and industrial research

German firms are the first to conduct research activities : Bayer, Hoechst, BASF, AEG, Siemens

Between 1919 and 1936, U.S. manufacturing firms established over a thousand industrial research laboratories. The number of scientists employed in research laboratories increased tenfold between 1920 and 1940, from 2,775 to 27,777. (*Research and Development in the United States since 1900, Steven W. Usselman, School of History, Technology, and Society, Georgia Institute of Technology, November 2013*)

The WW2 see a period of growing commitment of the federal government to research and science. (Cf the Manhattan Project) : **the New Frontier doctrine**. *"Scientific progress is one essential key to our security as a nation, to our better health, to more jobs, to a higher standard of living, and to our cultural progress." "**New frontiers of the mind are before us**, and if they are pioneered with the same vision, boldness, and drive with which we have waged this war we can create a fuller and more fruitful employment and a fuller and more fruitful life."-- FRANKLIN D. ROOSEVELT November 17, 1944*

Vannevar Bush (founder of National Science Fondation) advisor of the President propose a new vision that came to be known by the title **"Science – The Endless Frontier"** (1945). In his report Bush advocate for **a reseparation of the parties and the establishment of a new division of labor, in which academic researchers generated "basic" knowledge that diffused to more practically-oriented teams in industry and the military, who would develop applications**. The vision came to be known as the linear model of innovation. But National Science Fondation was only created in 1950 – which allows the development of specialized agencies

The Military-Industrial-University Complex 1940-1960
The **federal share** of research spending grew from **54% in 1953 to 65% in 1960**. Eisenhower in his farewell address of 1961 raised concerns about what he characterized as a military-industrial-university complex

Post 1960 : shifting to private sector
Federal funding spiked upward during the Reagan defense buildup of the early 1980s, but **funding from private sources increased** even more rapidly, as corporations responded to government incentives offering **tax credits** for funds spent on R&D. **The federal share dropped steadily to a low of just 25% in 2000**. Federal investment in basic research was accompanied by new policies intended to encourage the commercialization of results. **The Bayh-Dole Act of 1980** enabled universities to retain patent rights for innovations resulting from federally-funded research

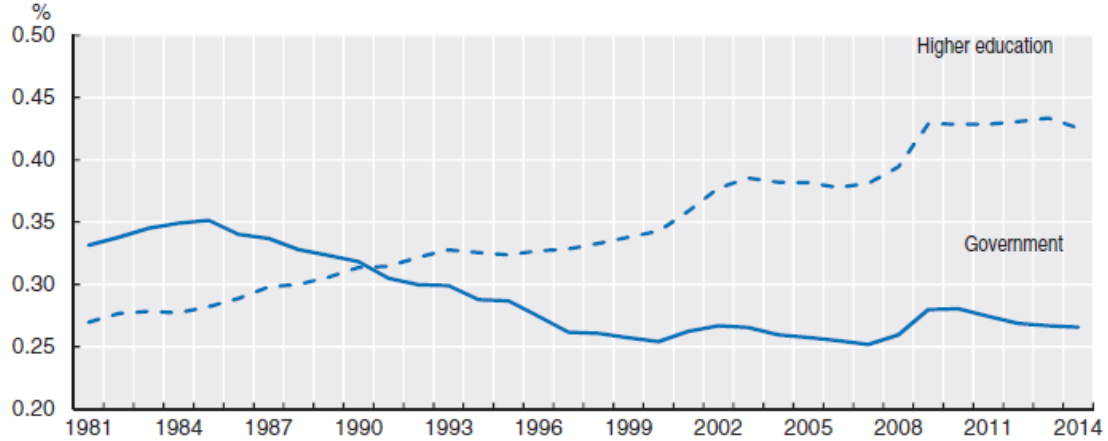
The new landscape

- **Expanded role of public institutions and public funding** in the innovation process
- **Small entrepreneurial firms** contribute disproportionate numbers of major innovations - the diminishing role of the largest corporations as sources of innovation
- innovations stemming from **collaborations** with spin-offs from universities and federal laboratories make up a much larger share.
- Expanding role of interorganizational collaborations in producing award winning innovations.

Where do Innovations Come From? Transformations in the U.S. Economy, 1970-2006
Fred Block, Department of Sociology, University of California, Davis Matthew R. Keller, Department of Sociology, Southern Methodist University May 2011

Venture capital has became an integral part of the innovation system in leading OECD countries, and combined with increased labour mobility, the result has been a larger role for small and medium sized enterprises (SMEs) in the industrial innovation systems of these countries.

Figure 3.9. **Public research has shifted towards universities**
R&D expenditure as a % of GDP, total OECD, 1981-2014



Sources: Based on OECD (2014a), *OECD Science, Technology and Industry Outlook 2014*, http://dx.doi.org/10.1787/sti_outlook-2014-en; OECD (2016a),

The new vision of public intervention

- **The existence of a market failure is not sufficient reason to legitimize the public intervention. It must also be shown that the State can do better than the market and specify the mechanisms of its intervention.**

  It is on the basis of these findings that a new conception of innovation policy emerges gradually, based on an "**incentive logic**" rather than a "quantitative logic". **Wherever possible, the government will try to complete the market and improve its functioning rather than replace it. It will play on the reaction capabilities of the agents rather than bypass them**

- **Rather than raising the amount of research for a given level of social return, the state can raise the actual social return on existing research through regulatory measures and institutional innovations**. It costs less and can be more efficient. One way of achieving this goal is **to develop knowledge transfers**: the mobility of public researchers to the private sector, the creation of companies by public researchers, the interest in patents for these researchers, research collaborations between the public and the private sector. Different measures have been taken to encourage cooperation between firms (European framework programs, Eureka, Sematech in semiconductors in the United States, MITI programs in Japan). These co-operatives allow the internalization of externalities upstream, while safeguarding downstream competition.

(from D. Guellec)

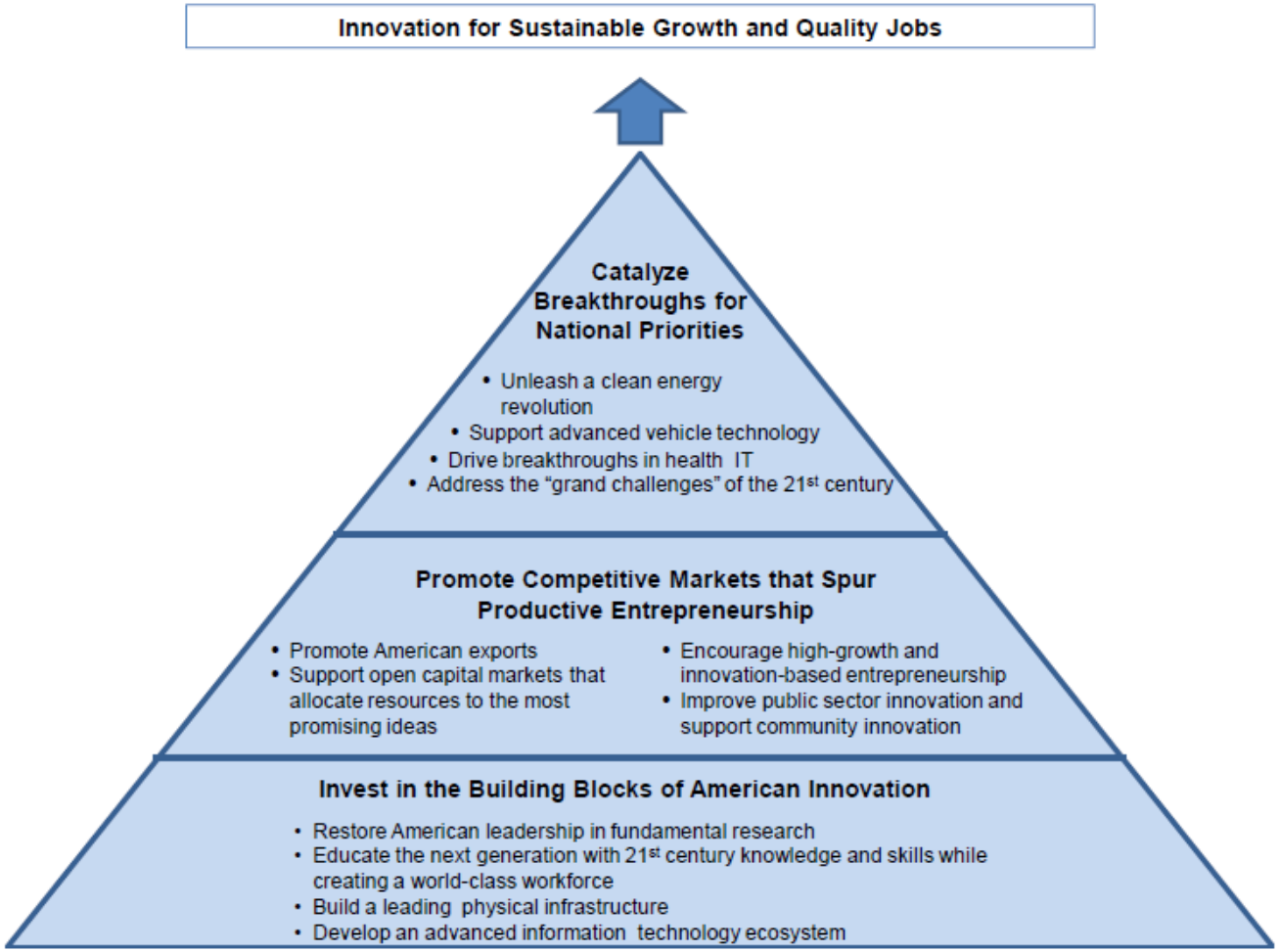
EXECUTIVE OFFICE OF THE PRESIDENT
NATIONAL ECONOMIC COUNCIL
OFFICE OF SCIENCE AND TECHNOLOGY POLICY

A STRATEGY FOR AMERICAN INNOVATION: DRIVING TOWARDS SUSTAINABLE GROWTH AND QUALITY JOBS

History should be our guide. The United States led the world's economies in the 20th century because we led the world in innovation. Today, the competition is keener; the challenge is tougher; and that is why innovation is more important than ever. It is the key to good, new jobs for the 21st century. That's how we will ensure a high quality of life for this generation and future generations. With these investments, we're planting the seeds of progress for our country, and good-paying, private-sector jobs for the American people."

-President Barack Obama, August 5, 2009

SEPTEMBER 2009



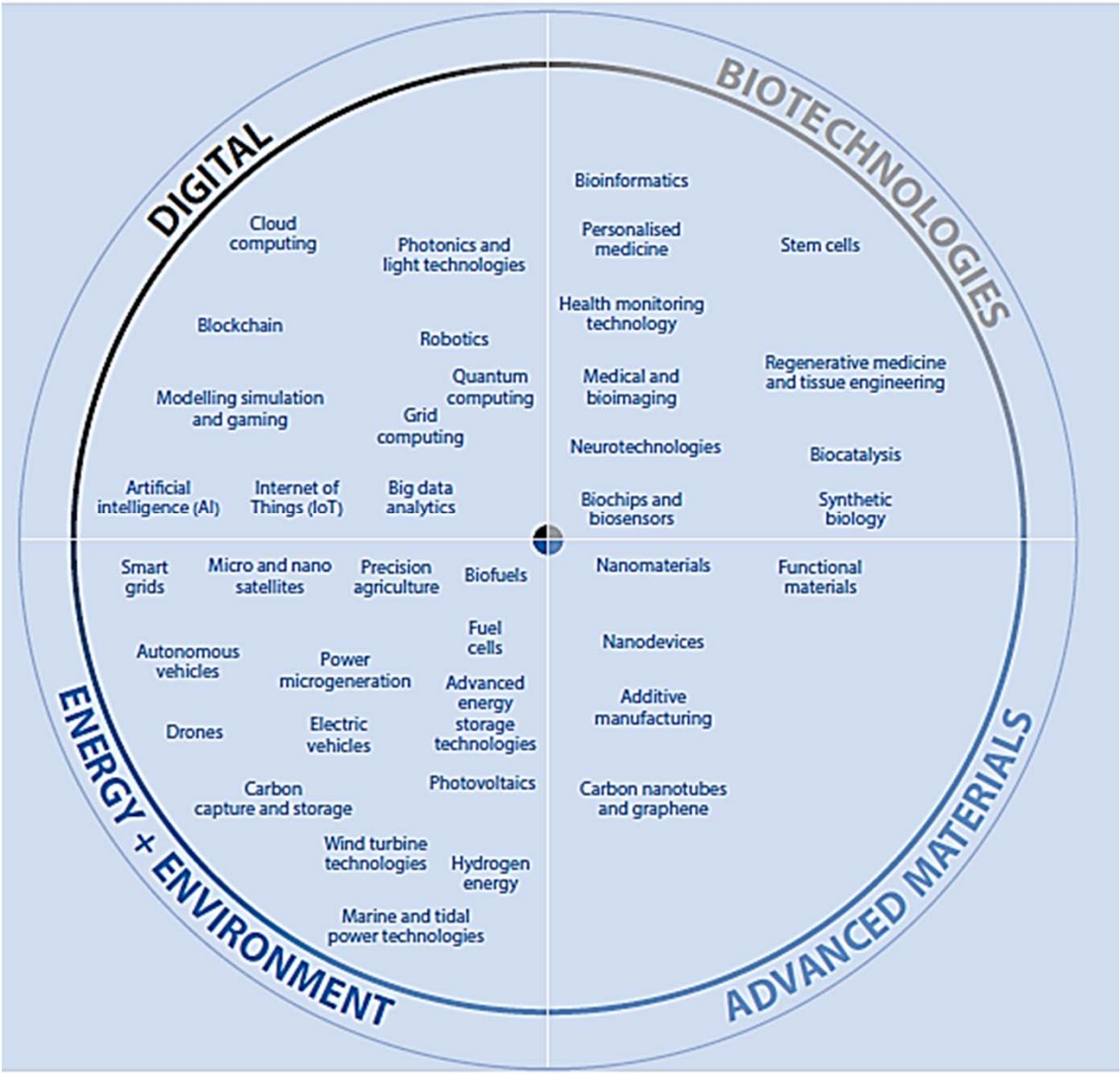
EU
Horizon 2020

- *In general, it is a problem that the European construction calls for dramatic declarations to build support for European STI policy. It contrasts with Japan and the US where less is said and more is done*
- *The framework programs have been used as instruments to promote European integration and there is no doubt that the programs have had an enormous effect in terms of building research collaboration of a lasting kind across Europe..*

(Oxford Handbook)

1. Funding long-term, higher-risk research Innovation for global challenges
2. Enabling the Next Industrial Revolution
3. Addressing common challenges through international co-operation in science and innovation
4. Raising the quality of science
5. Promoting excellence
6. Nurturing talent and skills
7. Investing in scientists and engineers
8. Promoting student exchanges
9. Facilitating researcher mobility
10. Promoting collaboration in innovation among firms
11. Supporting business innovation
12. Fostering entrepreneurship
13. Empowering society with science and technology

Figure 2.1. **40 key and emerging technologies for the future**



OCDE science & technology outlook 2016

Rise of IoT: “The number of connected devices in and around people’s homes in OECD countries will probably increase from 1 billion in 2016 to 14 billion by 2022 . By 2030, it is estimated that 8 billion people and maybe 25 billion active “smart” devices will be interconnected and interwoven in one huge information network” (OECD, 2015b).

"KETs are knowledge and capital-intensive technologies associated with high research and development (R&D) intensity, rapid and integrated innovation cycles, high capital expenditure and highly-skilled employment. Their influence is pervasive, enabling process, product and service innovation throughout the economy. They are of systemic relevance, multidisciplinary and trans-sectorial, cutting across many technology areas with a trend towards convergence, technology integration and the potential to induce structural change"

	Nanotechnologies	Micro and nanoelectronics	Photonics	Biotechnology	Advanced materials	Advanced Manuf. Systems
R & D actors	CEA Univ. of California JSTA CNRS MIT US DoE AIST NI of Health Univ. Texas FhG	CEA Univ. of California IMEC FhG AIST CNRS MIT JSTA IKETR Univ. Tohoku	CEA FhG MIT Univ. of California US DoE CNRS AIST JSTA US gvmt ETRI	Univ. of California CSIC CNRS JSTA Univ. of Wisconsin FhG North Carolina Univ. AIST MPI John Hopkins	CNRS Univ. of California CEA US DoE FhG AIST JSTA MIT US gvmt. NI of Health	FhG CEA US DoE Univ. of California JSTA CNRS AIST DLR NI of Health TNO
All actors	Samsung HP Univ. of California Canon 3M Agilent JSTA Hitachi Sony Matsushita	Infineon Tokyo Electron Matsushita Samsung Applied Materials Fujitsu Nikon ST Microelectronics NEC IBM	Samsung Matsushita 3M Corning Fuji Film Osram Sumitomo Sharp Kodak Sony	BASF Novozymes Evonik Du Pont Univ. of California Bayer Danisco Matsushita Mitsubishi Applera	BASF Du Pont Dow 3M Evonik Arkema Bayer Fuji GE Esso	Siemens Bosch Continental Endress & Hauser Fanuc Honeywell ABB GE Honda Hitachi

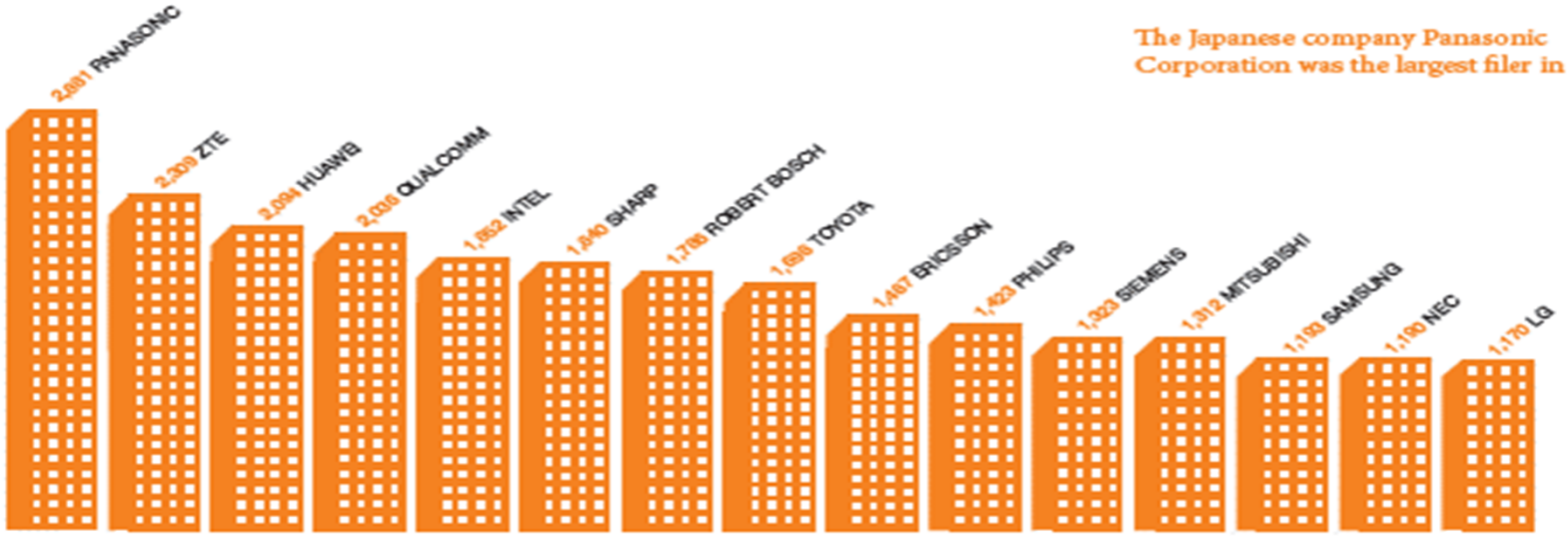
Figure 10: Global top 10 patent ranking in KETs

TOP 5 TECHNOLOGIES

1	2	3	4	5
Electrical machinery, apparatus, energy	Computer technology	Digital communication	Medical technology	Measurement
14,897 (+10.9%)	14,684 (+18.0%)	14,059 (+11.3%)	11,920 (+4.8%)	7,952 (+8.8%)

TOP 15 PCT APPLICANTS

The Japanese company Panasonic Corporation was the largest filer in 2013.



WIPO
WORLD INTELLECTUAL PROPERTY ORGANIZATION

WHO FILED THE MOST PCT PATENT APPLICATIONS IN 2013 ?

FILINGS UNDER THE PATENT COOPERATION TREATY (PCT)

TOP 10 COUNTRIES

205,300
Number of applications

+5.1%
Growth in 2013

1 USA	57,239
2 Japan	43,918
3 China	21,516
4 Germany	17,927
5 Republic of Korea	12,386
6 France	7,899
7 UK	4,865
8 Switzerland	4,367
9 Netherlands	4,198
10 Sweden	3,960

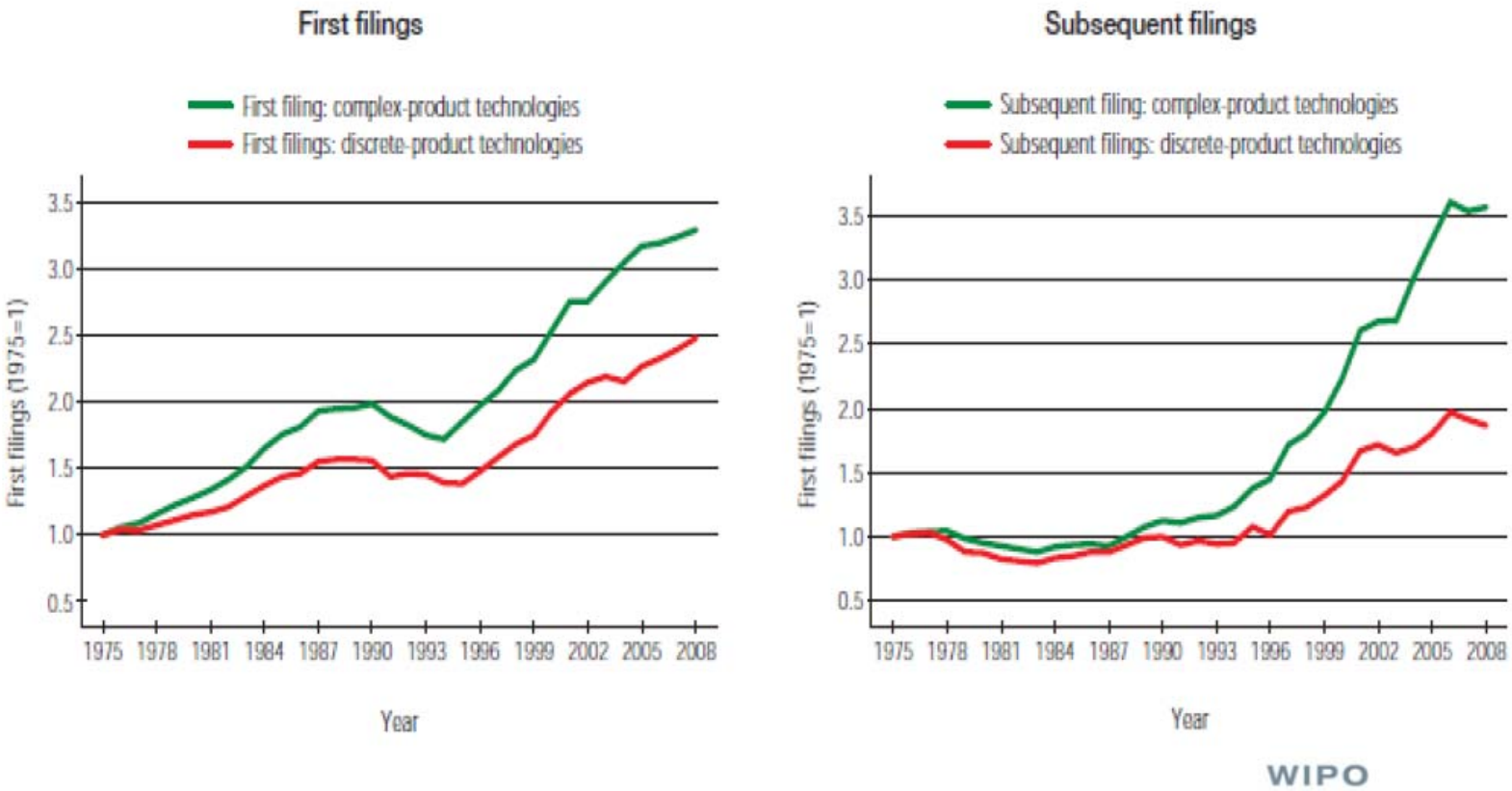
Global Researcher Views of Leading Countries in R&D by Research/Technology Area

Agriculture & Food Production	Automotive & Other Motor Vehicle	Commercial Aerospace, Rail & Other Non-Auto. Transport	Military Aerospace, Defense & Security	Chemicals, Nanotech & Advanced Materials	Energy Generation & Efficiency	Environmental & Sustainability	Healthcare, Medical, Life Science & Biotech	Information & Comm. (ICT)	Instruments & Other Non-ICT Electronics
U.S.	Germany	U.S.	U.S.	U.S.	U.S.	Germany	U.S.	U.S.	U.S.
China	Japan	France	China	Japan	Germany	U.S.	U.K.	Japan	Germany
Germany	U.S.	Germany	Russia	Germany	Japan	Japan	Germany	China	Japan
Australia	South Korea	China	U.K.	China	China	U.K.	Japan	Germany	China
Brazil	China	Japan	France	U.K.	U.K.	Sweden	Switzerland	South Korea	South Korea

Source: Battelle

Result in more complex innovations

Figure 9 Trend in total complex and discrete technology patent filings



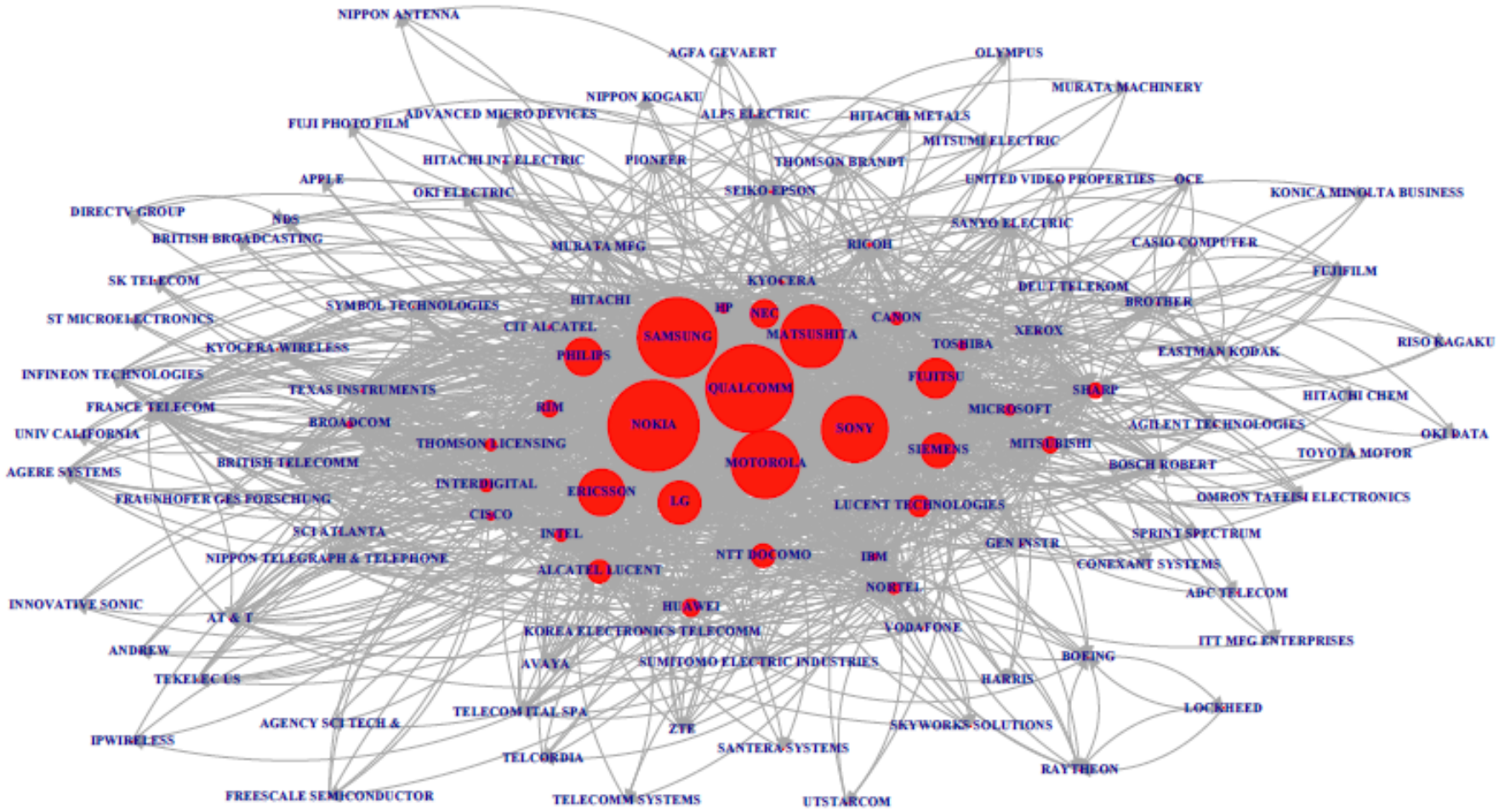
More radical business model changes combine knowledge from unrelated fields. Companies pull in expertise from industries and fields that have never been related previously to the current industry to which the small firm belongs

Navigating the deep oceans of IP

The tools have largely improved:

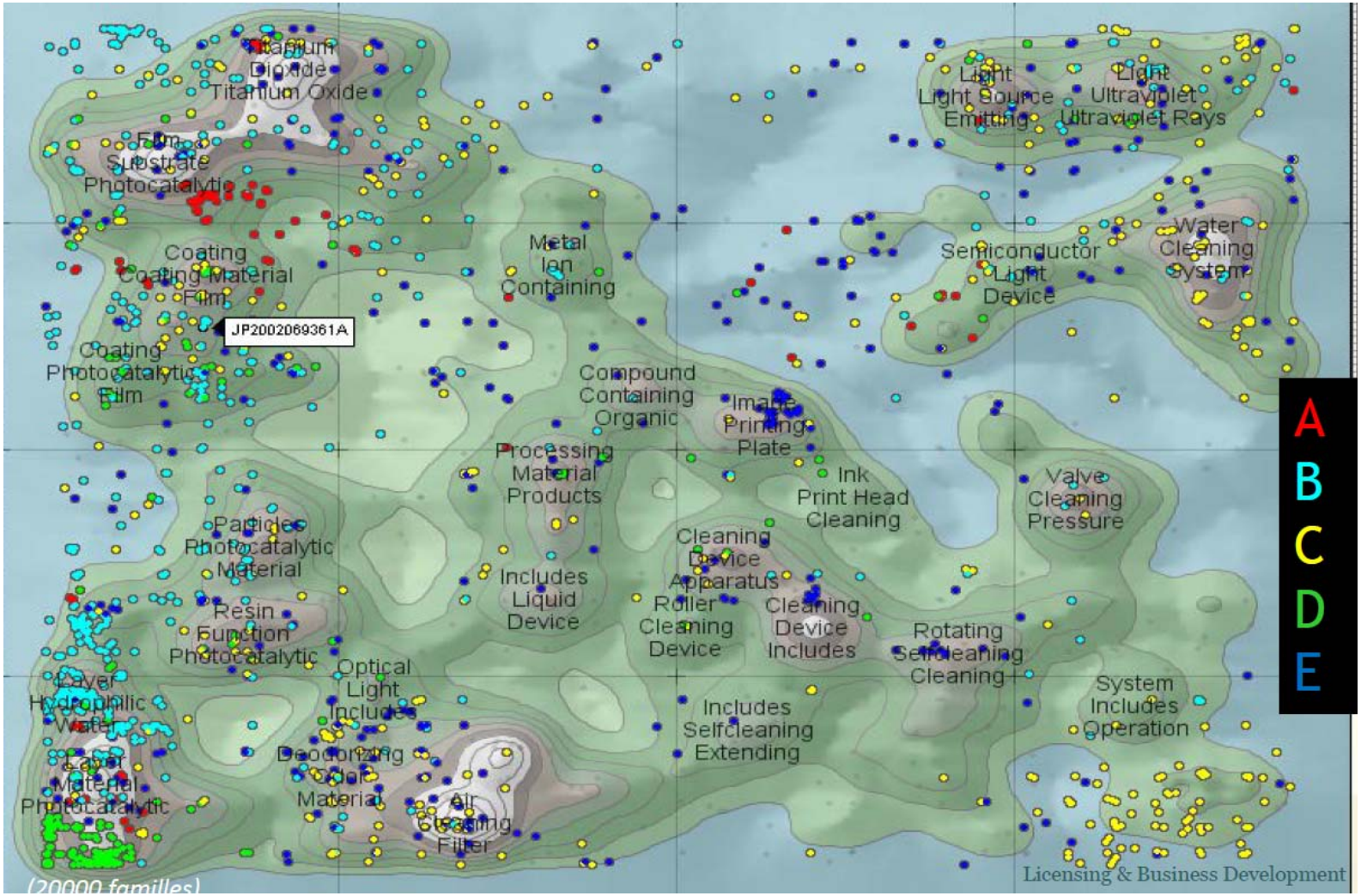
- Large Data
- Cartography

Can they keep up with IP inflation?
Chinese translation?



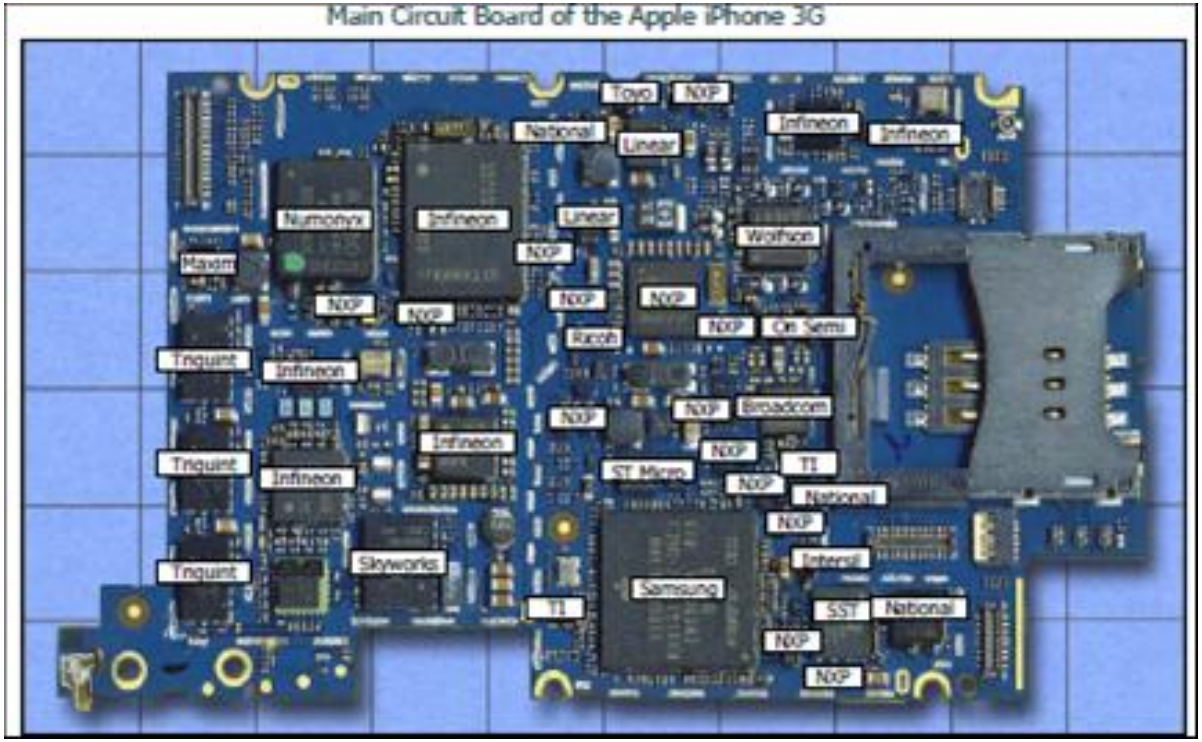
Network of critical references in telecommunications in 2005

Tech mapping



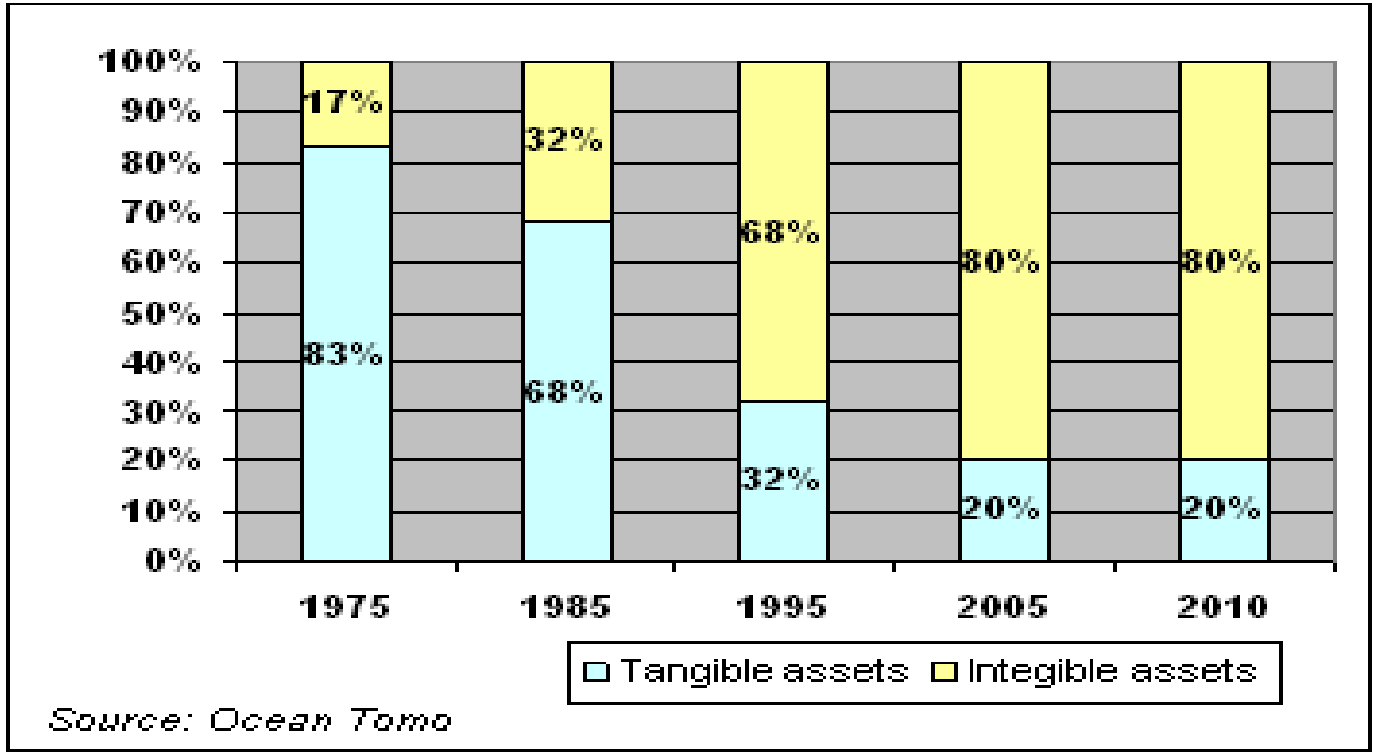
PATENT THICKETS AND ANTI-COMMONS

Plethora of overlapping property right block single property exploitation



The financial sector:
In search of Holy Grail

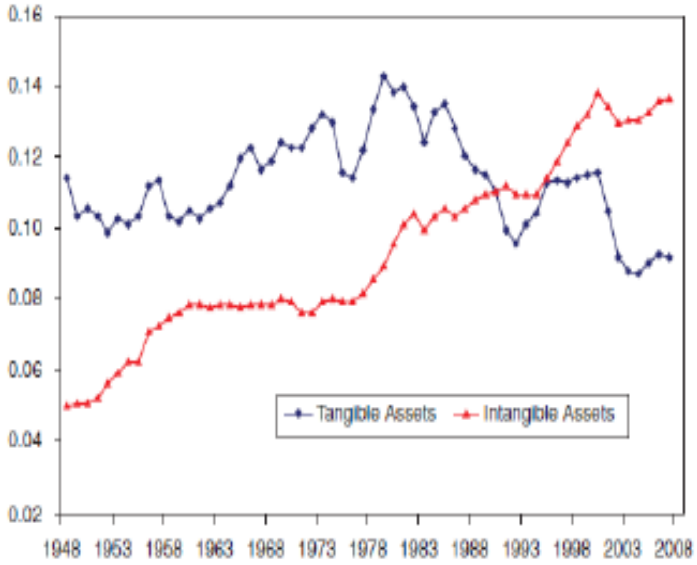
Part croissante de la valeur des actifs immatériels dans la valeur des entreprises
S&P 500 Index Stock



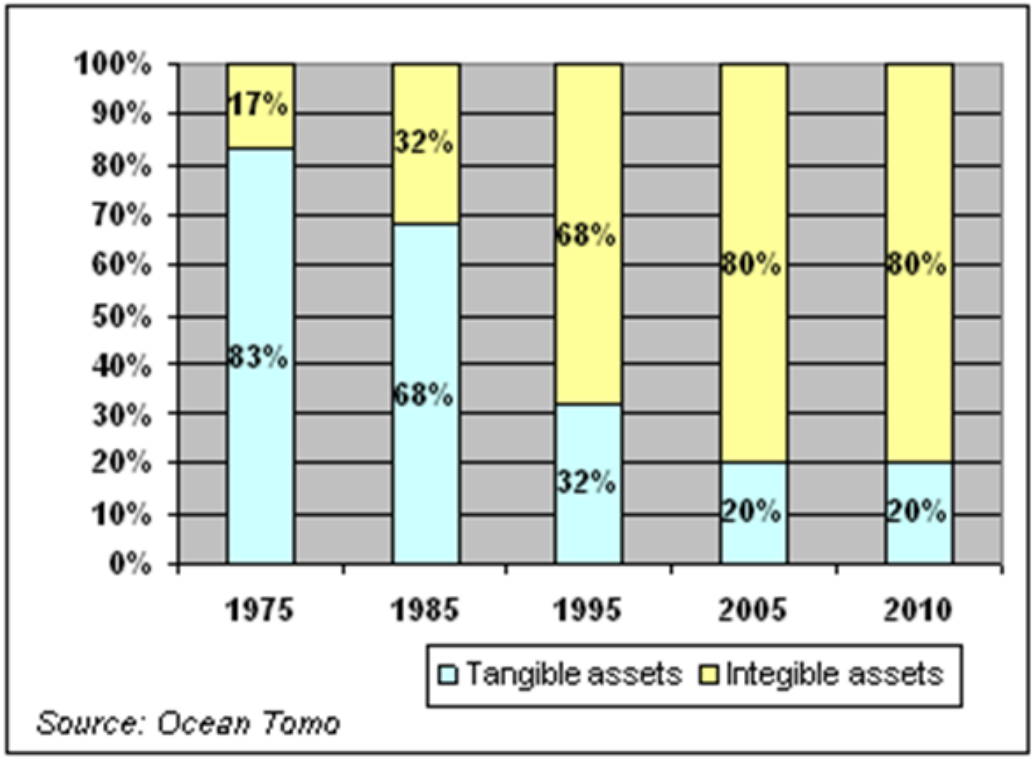
Growth of intangible

Graphique 2 : le développement des actifs immatériels aux États-Unis

Parts de l'investissement physique (en bleu) et immatériel (en rouge) dans les investissements des entreprises non agricoles aux Etats-Unis (en %)

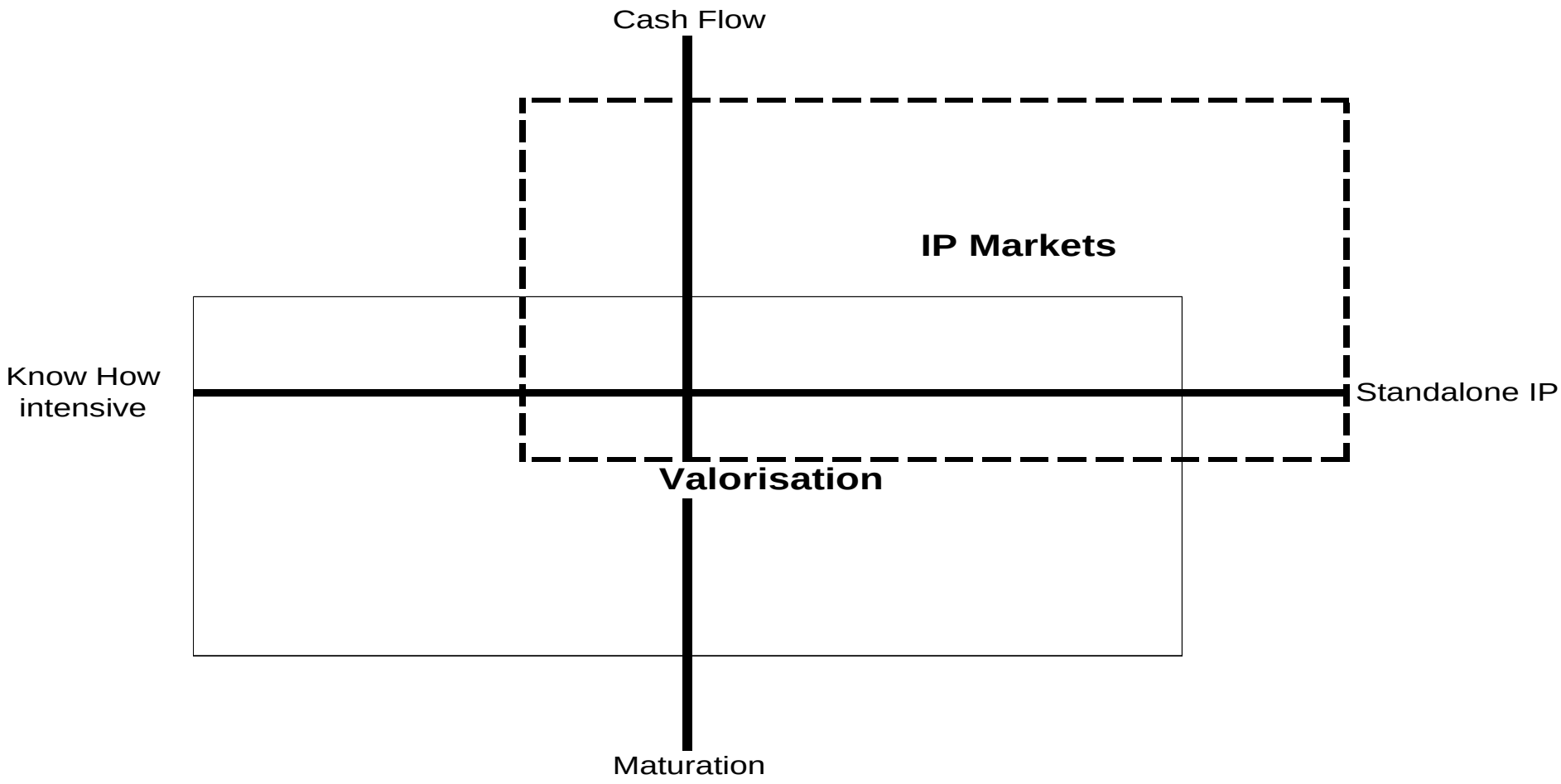


Source : Mackie, 2009

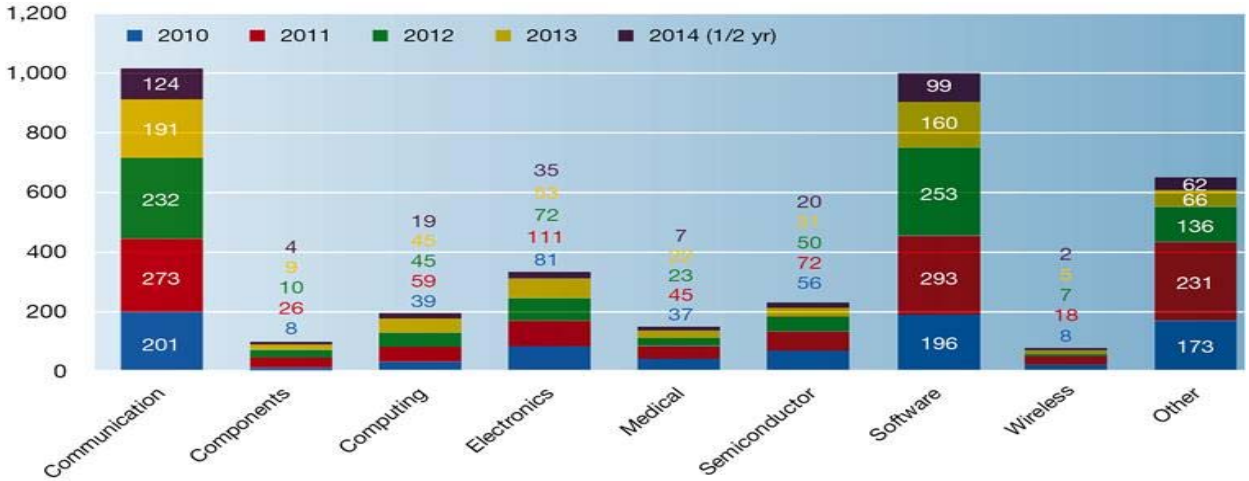


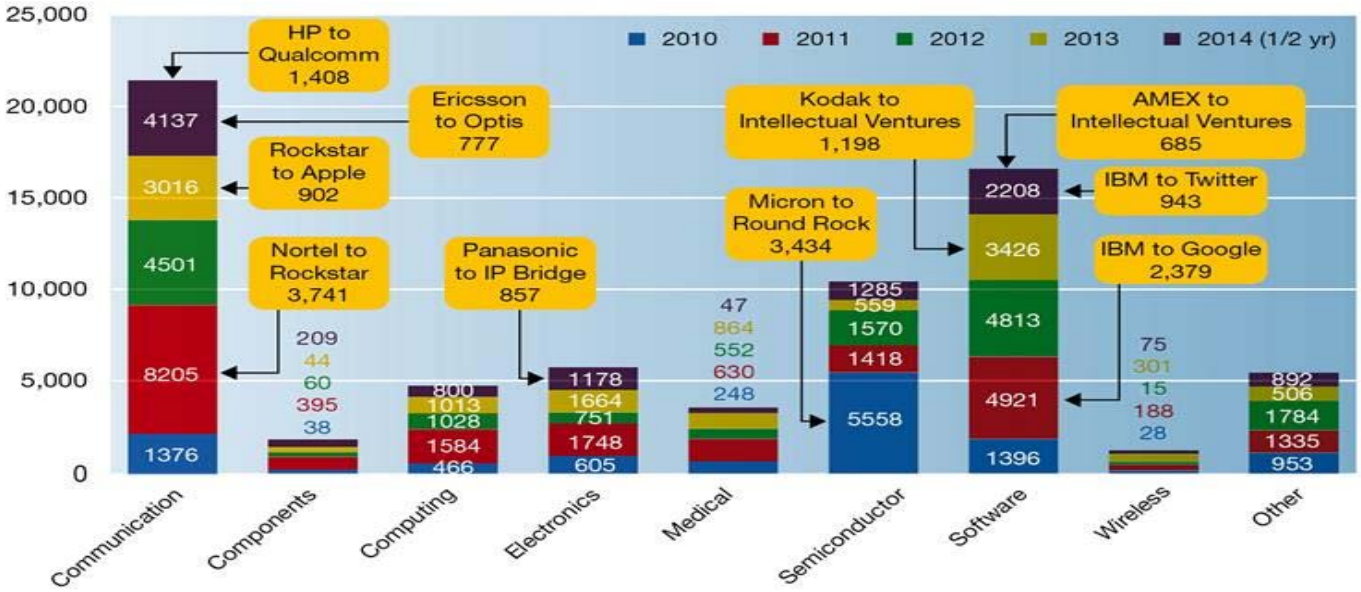
S&T 500 Index stock

Patents and financial assets



Transactions

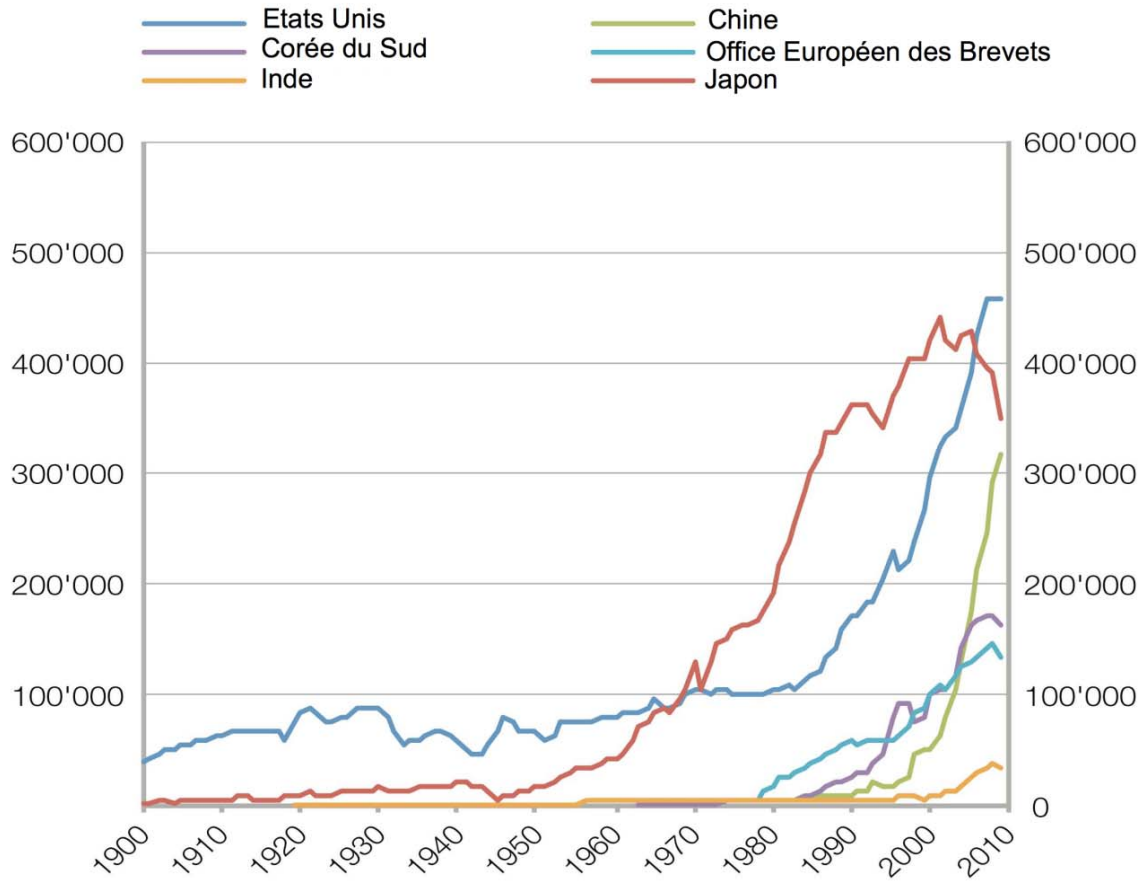




Patent explosion

Patent filings grew by 9.2% in 2012, representing the fastest growth in the past 18 years –

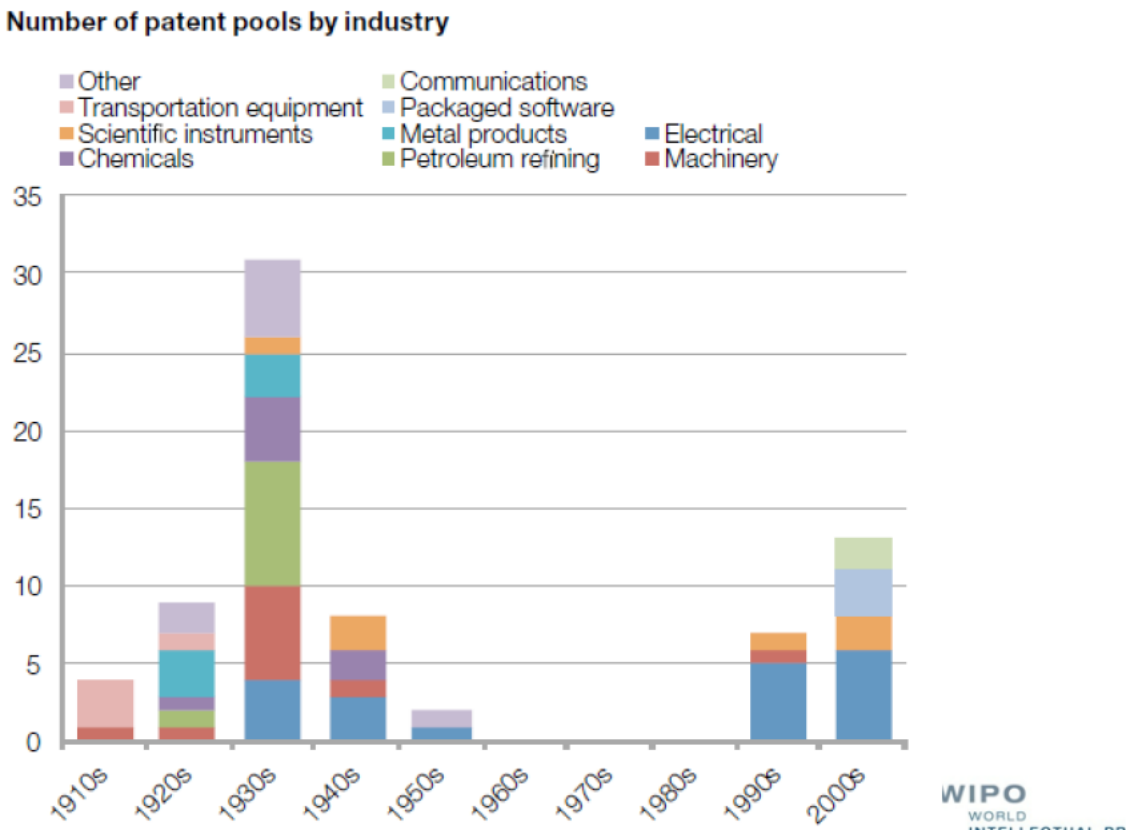
2,5million patent filling in 2013



Number of patent filling
WIPO, 2013

Can patent pools be (part of) the answer?

Patent pools: Second Wave



Patent pools (1856-2006)

Early pools associated with monopolies and cartels (1856-1919) Sewing Machine Combination – 1856 National Harrow Company - 1890 United Shoe Machinery Company - 1899 Motion Picture Patents Company (MPPC) - 1908 Association of Sanitary Enameled Ware Manufacturers (Standard Sanitary) - 1909 Standard Oil Cracking Pool - 1911 Association of Licensed Automobile Manufacturers (ALAM) - 1903 Davenport folding beds - 1916 Glass Container Association of America (Hartford-Empire) – 1919 National Lead Co. - 1920 New Wrinkle - 1937 Line Material Co. - 1938 Singer '401' – 1956	**More recent pools that address standardization (1995-current)** MPEG-2 Patent Portfolio - 1997 Bluetooth Special Interest Group (SIG) – 1997 OpenCable Applications Platform (OCAP) - 1997 DVD3C – 1998 G.729 Audio Data Compression - 1998 MPEG-4 - 1998 IEEE 1394/FireWire - 1999 3G Patent Platform Partnership – 1999 DVD6C - 1999 Multimedia Home Platform (DVB-MHP) – 2004 AVC/H.264 – 2005 Open Invention Network (OIN) for Linux Software – 2005 UHF RFID Consortium - 2005
Pools created in response to U.S. government policy objectives Manufacturers Aircraft Association - 1917 Radio Corporation of America (RCA) - 1919	**Recent Pools (and proposals for pools) involving biomedical and agricultural technologies** Pillar Point Partners (Laser Eye Surgery) – 1992 Golden Rice Pool - 2000 AvGFP (Green Florescent Protein) - 2001 Public Intellectual Property Resource for Agriculture (PIPRA) – 2001 stART Licensing, Inc. – 2005 The SARS IP Working Group – proposed 2005 Essential Medical Inventions Licensing Agency (EMILA) – proposed 2006 UNITAID pool for AIDS medications – proposed 2006

Examples of pools

- **MAA, 1917** : Wright brothers held most of the essential patents on airplane manufacturing components. They were charging high royalty rates, and the time and expenses involved in litigation was causing stagnation in the airline industry at a time when the United States needed to increase its aircraft production for the war effort. To that end, an advisory panel headed by then-Assistant Secretary of the Navy Franklin D. Roosevelt recommended the formation of a patent pool.
- **The SIG** (bluetooh) does not make, manufacture, or sell Bluetooth products, but owns the trademarks and standardization documents, markets the Bluetooth brand, and licenses to more than 7,000 member companies involved in making, manufacturing, and selling Bluetooth-enabled products.
- **ETSI** (European Telecommunications Standards Institute) licenses the intellectual property rights essential to the MHP specifications. ETSI is a non-profit organization based in Sophia Antipolis, France, and established under French law for the standardization of telecommunications in Europe. The purpose of this pool is to protect patent-holders by means of a “covenant not to sue” clause, thereby promoting the manufacture of MHP-based products. 655 members from 59 countries in and out of Europe participate in ETSI’s activities, and ETSI is officially recognized by the European Commission
- **MPEG-2** is a video compression technology that was adopted as a standard by the Motion Picture Expert Group (MPEG) International Standards Organization (ISO) in 1995. The technology reduces the number of bits in a file, thereby making videos easier and faster to transmit, and available over lower bandwith carriers. The purpose of the MPEG-2 pool is to offer “one-stop shopping” for licenses necessary to produce MPEG-2 products

- GE Healthcare, BioImage A/S, Invitrogen IP Holdings, Amersham Biosciences, and ColumbiaUniversity in 2001 pooled several patents related to **green florescent protein (GFP),** a reporter molecule drawn from bioluminescent marine animals which allows researchers to visualizecellular proteins without using chemical dyes. The purpose of the GFP pool was to clear a patent thicket that restricted commercial use of GFPs.
- **PIPRA** is an initiative aimed at making agricultural technology more readily available for the development and distribution of subsistence crops in the developing world. To this end, PIPRA promotes the management of IP in such ways that biotechnological products are made freely available for research and humanitarian projects, and is exploring the development of a patent pool to give biotech crop researchers greater freedom to operate
- The incentives to create **biotechnology patent pools** are similar to those in other industries. Overlapping patent claims can block the commercialization and adoption of technologies. However, there are additional motives for considering patent pools in the life sciences. Patent pools can be created for philanthropic purposes : the UNITAID patent pool focuses on making medicines for diseases such as HIV/AIDS, malaria and tuberculosis available to countries in need.

Pool Management

VIA LICENSING®

Bridging Innovation and Commerce

Long Term Evolution

Standards-Essential Patent Licensing

Via Licensing's LTE patent pool brings together the essential LTE patents of multiple innovators into a single license offering that simplifies the licensing process, promotes transparent pricing, and creates a level playing field for all LTE licensees.

License Fees for each Licensed Product Sold or Otherwise Supplied: General Terminal Products

Volume (per unit/annual reset)	Per Unit Fee
For the first 1 to 500,000 units	$3.00
For units 500,001 to 2,500,000	$2.55
For units 2,500,001 to 5,000,000	$2.40
For units 5,000,001 to 10,000,000	$2.25
For units 10,000,001 or more	$2.10

Via Licensing's LTE patent pool brings together the essential LTE patents of multiple innovators into a single offering. The LTE Patent License Agreement provides access to all of the patents from the participating licensors which are essential to the implementation of the 3GPP LTE standard. This allows companies that manufacture or sell products implementing the LTE standard to gain access to this portfolio of essential LTE patents in a single, cost-effective transaction.

Via Licensing's LTE patent pool provides transparent and nondiscriminatory access to LTE essential patents in a fair and cost-effective license that is designed to encourage growth and development of this important technology and related wireless markets. It is provided within an open licensing framework offering licensees a well-proven method of obtaining essential patent rights coupled with the assurance of a level playing field. As an independent administrator, Via Licensing is committed to meeting the needs of both patent owners and companies deploying LTE products and services.

Via Licensing's LTE patent pool provides essential LTE IP from the following technology innovators:

- AT&T Intellectual Property II, L.P.
- Clear Wireless LLC
- Deutsche Telekom AG
- DTVG Licensing, Inc.
- Hewlett-Packard Company
- KDDI Corporation
- NTT DOCOMO
- SK Telecom Co., Ltd
- Telecom Italia S.p.A.
- Telefónica, S.A.
- ZTE Corporation

Good and bad pools

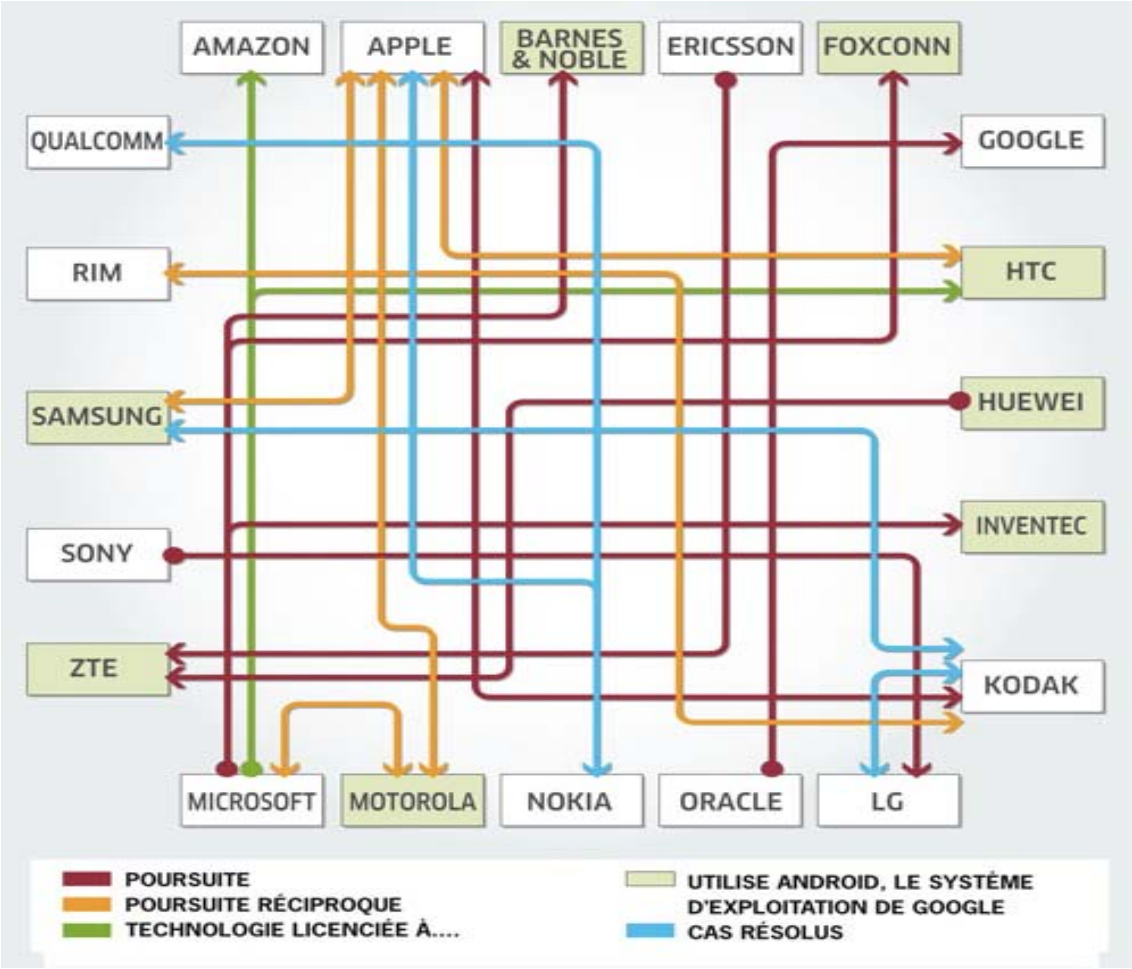
Patent pools comprising complementary patents can be welfare enhancing, because they solve the coordination problem.

On the other hand, patent pools containing substitute technologies are not, since their main objective is to soften price competition among pool members.(WIPO, 2011)

One way **to differentiate** beneficial pools from harmful ones is to look at the detailed provisions governing them. **Two types of provisions are relevant: so-called grant backs and independent licensing rules** Lerner, J. & Tirole, J. (2004). Efficient Patent Pools. *The American Economic Review, 94(3), 691-711.*

- **Grant backs** commit pool members to offer future patents to the pool at no fee if such patents are deemed relevant to the patent pool.
- **Independent licensing rules** allow any pool member to license their patent outside of the pool (In anticompetitive pools, the freedom of members to license their technology independently would break the pool's ability to fix prices above the competitive rate).

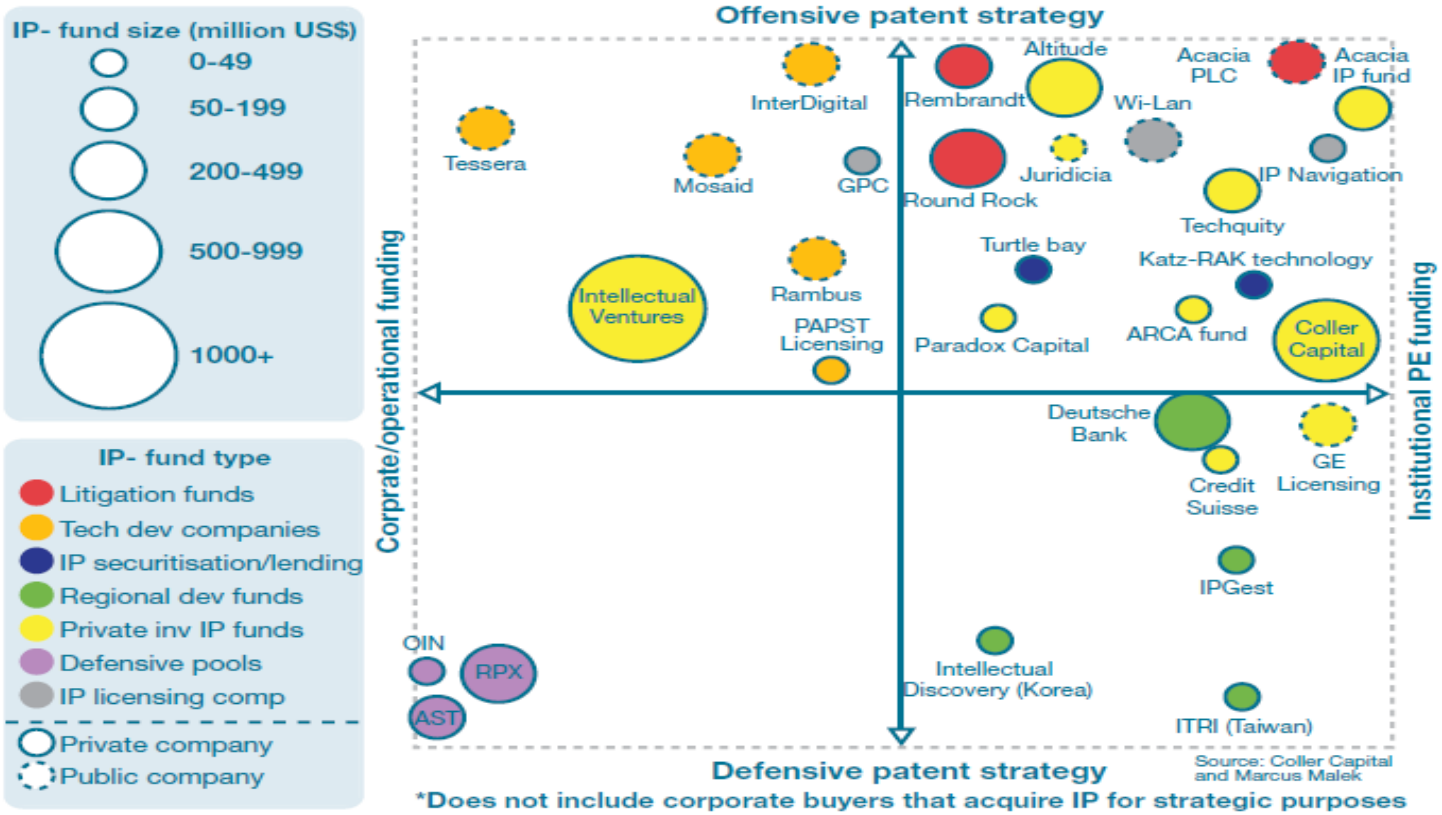
Wartime economy



Procès entre les principales entreprises de télécommunications. Source : Reuters, Aout 2011

NPEs

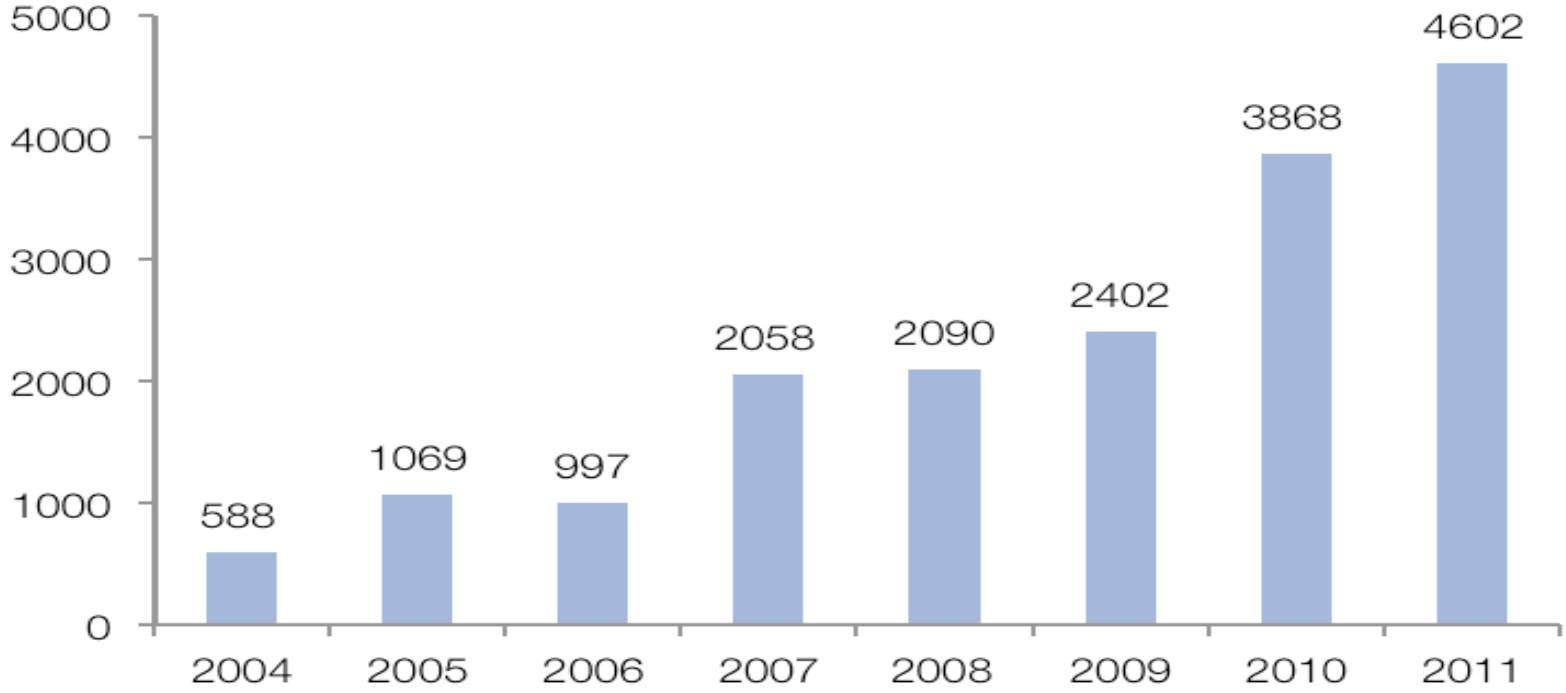
Table 1. **The IP acquisition marketplace (illustrative) – the rise of financial/NPE buyers***



Source : IAM, july 2011, change in IP market, P. Holden

Lawsuits initiated by NPEs, 2004-2011

Patent Freedom, 2012



"Suits brought by PAEs have tripled in just the last two years, rising from 29 percent of all infringement suits to 62 percent of all infringement suits. Estimates suggest that PAEs may have threatened over 100,000 companies with patent infringement last year alone."

Executive office of the President, 2013

Parties involved

source IAM

Rank	Defendant	Number of cases
1	Apple	65
2	AT&T	65
3	Samsung	52
4	Verizon	51
5	Hewlett-Packard	48
6	LG	44
7	Amazon.com	43
8	Sony Corp	42
9	Toshiba Corp	41
10	Dell	40
11	HTC Corp	39
12	Sprint Corp	37
13	T-Mobile	33
14	Nokia Corp	33
15	Blackberry	33

Rank	Plaintiff	Number of cases
1	Acacia Technologies	148
2	NovelPoint	135
3	Wyncomm LLC	129
4	The Pacid Group LLC	109
5	Eclipse IP LLC	95
6	Brandywine Communications Technologies	85
7	The Tawnsaura Group LLC	77
8	Marathon Patent Group	76
9	Beacon Navigation Gmbh	74
10	Intellectual Ventures	73
11	Uniloc	66
12	Innovative Wireless Solutions LLC	64
13	Olivistar LLC	60
14	Ubicomm LLC	60
15	Sonic Industry	45

Settlement vs litigation

Table 3. Costs for cases settled without litigation
(per company in million dollars)

	Mean cost by type			Total Cost per company, non-litigated cases		Comparable Litigation Cost per company	
	Legal	Licensing	Other	Mean		Mean	
All	0.50	24.59	4.66	29.75	(13.89)	58.38	(19.18)
Company size							
Small/medium	0.05	7.85	0.23	8.14	(7.68)	7.06	(3.15)
Large	0.77	34.40	7.25	42.43	(21.22)	88.47	(28.95)
Industry							
Software	0.38	11.83	4.14	16.35	(9.14)	38.34	(20.74)
Hardware	0.56	30.76	4.91	36.24	(20.03)	68.08	(26.46)

Note: Standard errors in parentheses. Results are for a sub-sample of 46 companies that reported full litigation and non-litigation costs. Figures are totals over 2005-11 per company, although not all companies reported all years.

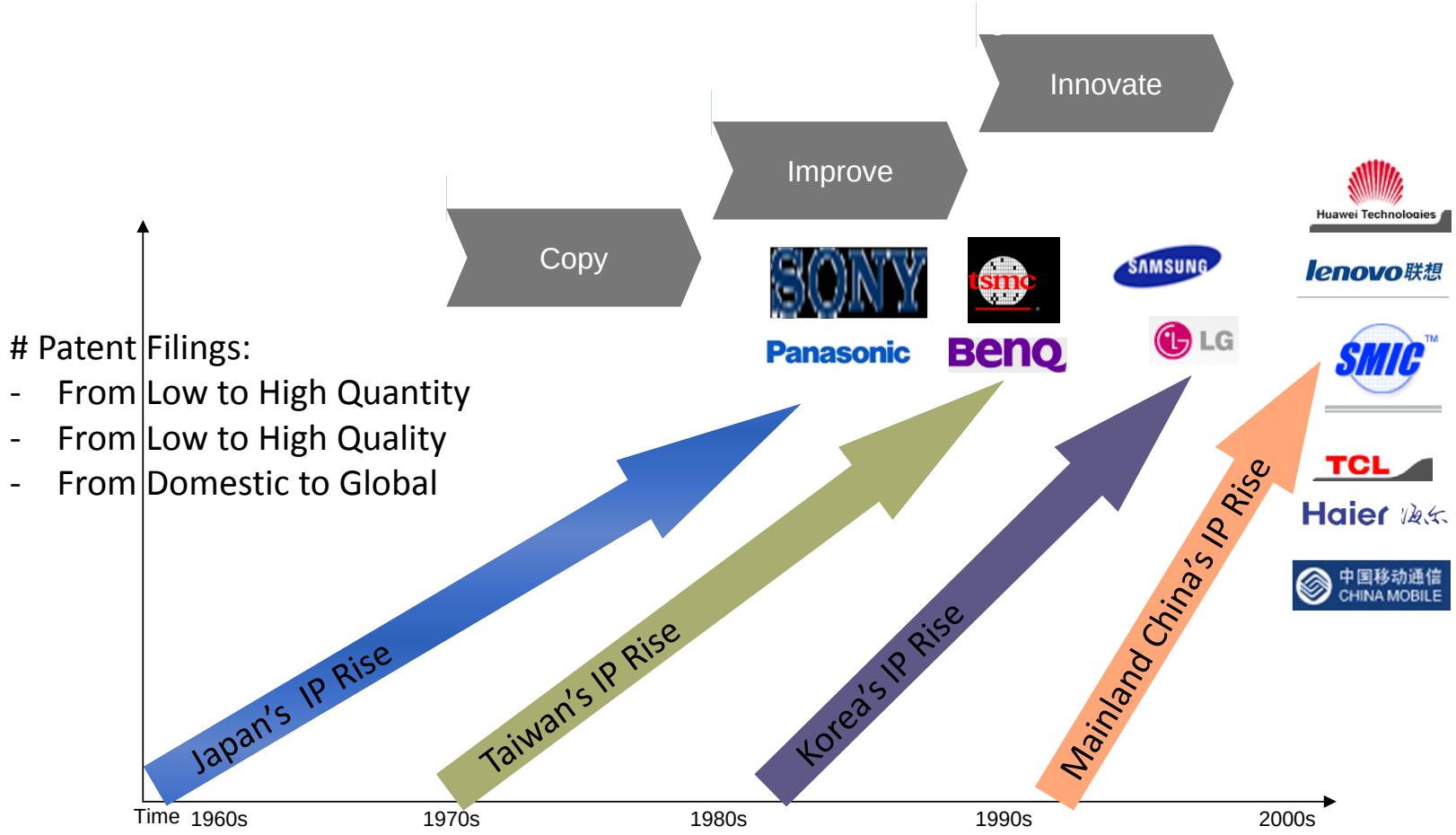
History suggests that it should be possible to address these challenges.

- Similar cases occurred with patents for agricultural equipment and for railroad equipment in the late 19th century, in which there was great uncertainty about whether a valid patent had been infringed. Once these underlying conditions were changed, this business model was no longer profitable and litigation of this type fell dramatically.

- Policies such as the following: fostering clearer patents with a high standard of novelty and non-obviousness; reducing disparity in the costs of litigation for patent owners and technology users; and increasing the adaptability of the innovation system to challenges posed by new technologies and new business models; would likely have a similar effect today.

Asia

Asia rise and catch up



Source：V. Pluvinage

CHINA

Evolution of China Patent System

- 1984 China acceded to Paris Convention
- 1985 First China patent law came into force
- 1993 First amendment of China patent law
- 1993 China acceded to PCT
- 1996 China acceded to Budapest Treaty
- 2000 China acceded to the WTO
- 2001 Second amendment of China patent law
- 2007 Third amendment of China patent law started
- **Current Developments**
  - Court rulings –training of magistrates
  - Opening of insight into legal system (both business and other)
  - Increasing support to enforcement
  - Government support to filing of applications

And the story just began

Backup

VC Myths:
In frantic search of a new paradigm

Six Myths About Venture Capitalist ,
Diane Mulcahy, Harvard business review, May 2013

Myth 1-Venture Capital Is the Primary Source of Start-Up Funding
Venture capital financing is the exception, not the norm, among start-ups. Historically, only a tiny percentage (fewer than 1%) of U.S. companies have raised capital from VCs. And the industry is contracting: After peaking in the late 1990s, the number of active VC firms fell from 744 to 526 in the decade 2001–2011, and the amount of venture capital raised was just under $19 billion in 2011, down from $39 billion in 2001, according to the National Venture Capital Association (NVCA).
But less venture capital doesn't mean less start-up capital. Non-VC sources of financing are growing rapidly and giving entrepreneurs many more choices than in the past. Angel investors—affluent individuals who invest smaller amounts of capital at an earlier stage than VCs do—fund more than 16 times as many companies as VCs do, and their share is growing

Myth 2: VCs Take a Big Risk When They Invest in Your Start-Up
VCs are often portrayed as risk takers who back bold new ideas. True, they take a lot of risk with their investors' capital—but very little with their own

Myth 3: Most VCs Offer Great Advice and Mentoring
A common VC pitch to entrepreneurs is that the firm brings much more than money to the table: It offers experience, operational and industry expertise, a broad network of relevant contacts, a range of services for start-ups, and a strong track record of successful investing.

Myth 4: VCs Generate Spectacular Returns

We found that the overall performance of the industry is poor. VC funds haven't significantly outperformed the public markets since the late 1990s, and since 1997 less cash has been returned to VC investors than they have invested. A tiny group of top-performing firms do generate great "venture rates of return": at least twice the capital invested, net of fees

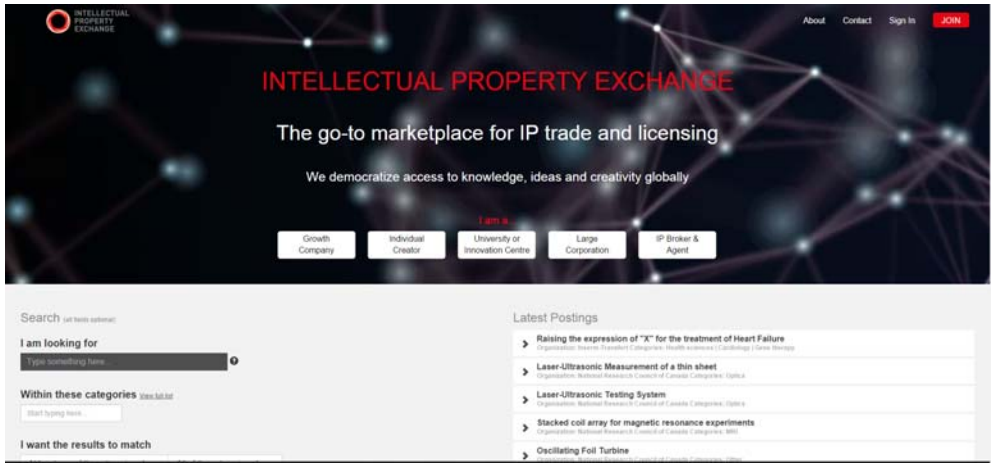
Myth 5: In VC, Bigger Is Better

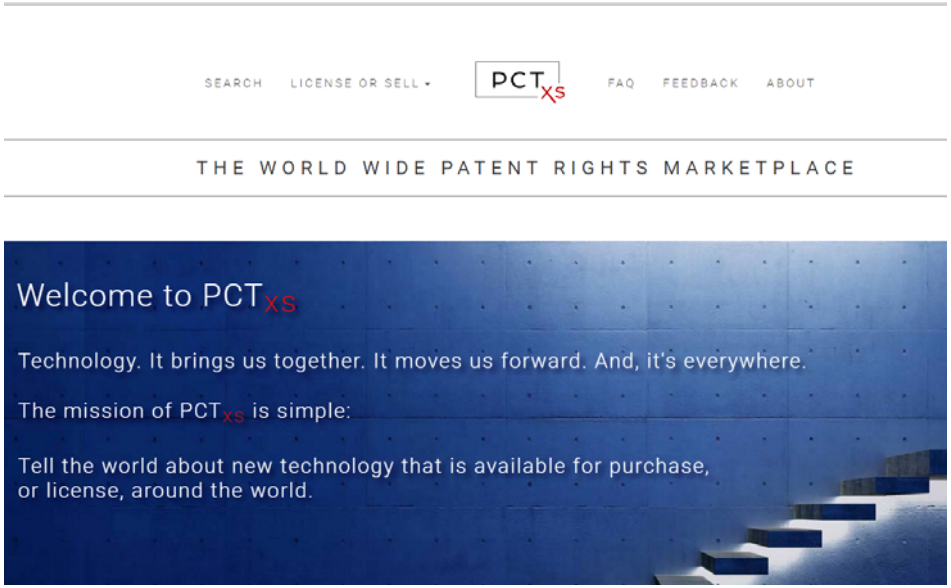
In fact industry and academic studies show that fund performance declines as fund size increases above $250 million. We found that the VC funds larger than $400 million in Kauffman's portfolio generally failed to provide attractive returns: Just found out of 30 outperformed a publicly traded small-cap index fund.

Myth 6: VCs Are Innovators

Any innovation in financing start-ups, such as crowdfunding and platforms like AngelList and SecondMarket, has come from outside the VC industry. The story of venture capital is changing. Entrepreneurs have more choices for financing their companies, shifting the historical balance of power that has too long tilted too far toward VCs. Entrepreneurs will enjoy a different view as they move from the backseat into the driver's seat in negotiating with VCs. An emerging group of "VC 2.0" firms are going back to raising small funds and focusing on generating great returns rather than large fees. And the industry's persistent underperformance is finally causing institutional investors to think twice before investing in venture capital. As a result, VCs will continue to play a significant, but most likely smaller, role in channeling capital to disruptive start-ups.

To boldly go





INTELLECTUAL PROPERTY EXCHANGE
www.ipexchange.global

Through standardization, automation and e-commerce we create

The world's most user-friendly Intellectual Property marketplace

Patents • Copyright • Trademarks • Trade Secrets • Designs • Technology • Know how • Research collaborations

IP commerce

- World's only automated match-making and trading platform for most types of innovations, ideas and creativity
- Just as users of Facebook, eBay, Amazon and even the New York Stock Exchange agree to abide by a set of ground rules, so everyone trading IP can now adopt a standard set of terms and conditions.

Because of all this, we are able to democratize access to knowledge, ideas and creativity

Recent initiatives are being launched

PCTxs is a fully searchable, auto-populating, internet based marketplace for the sale or license of available National Phase patent application rights for International Patent Applications around the world. PCTxs may also be used for non-PCT applications and non-published PCT applications.

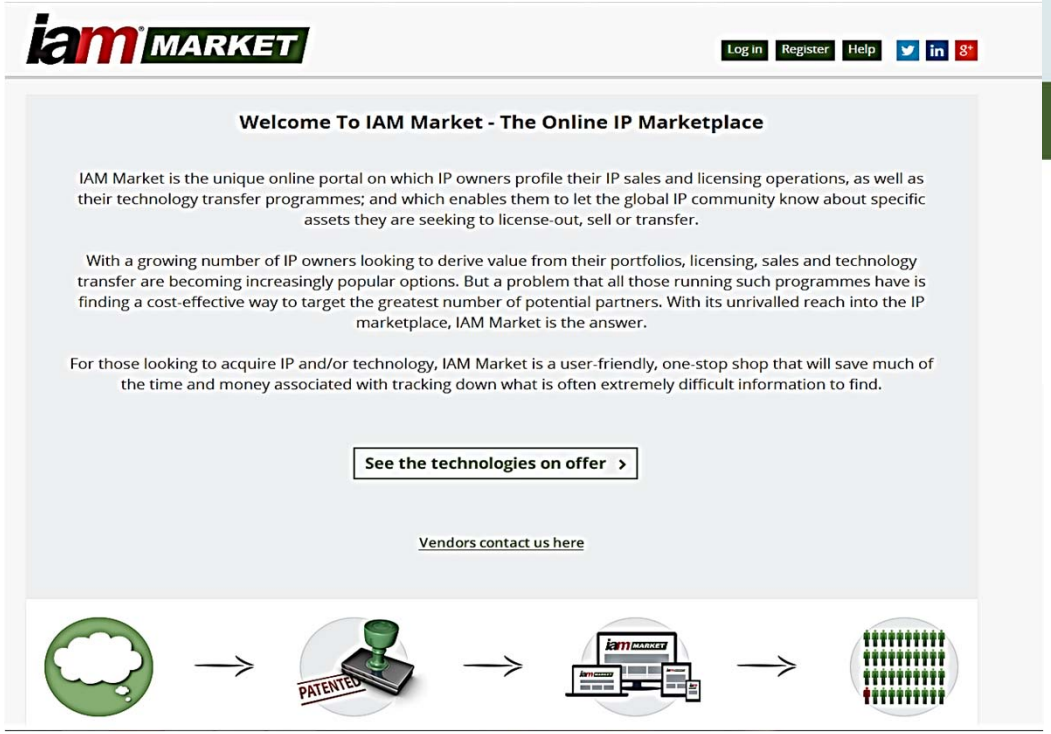
New Patent Purchase Program

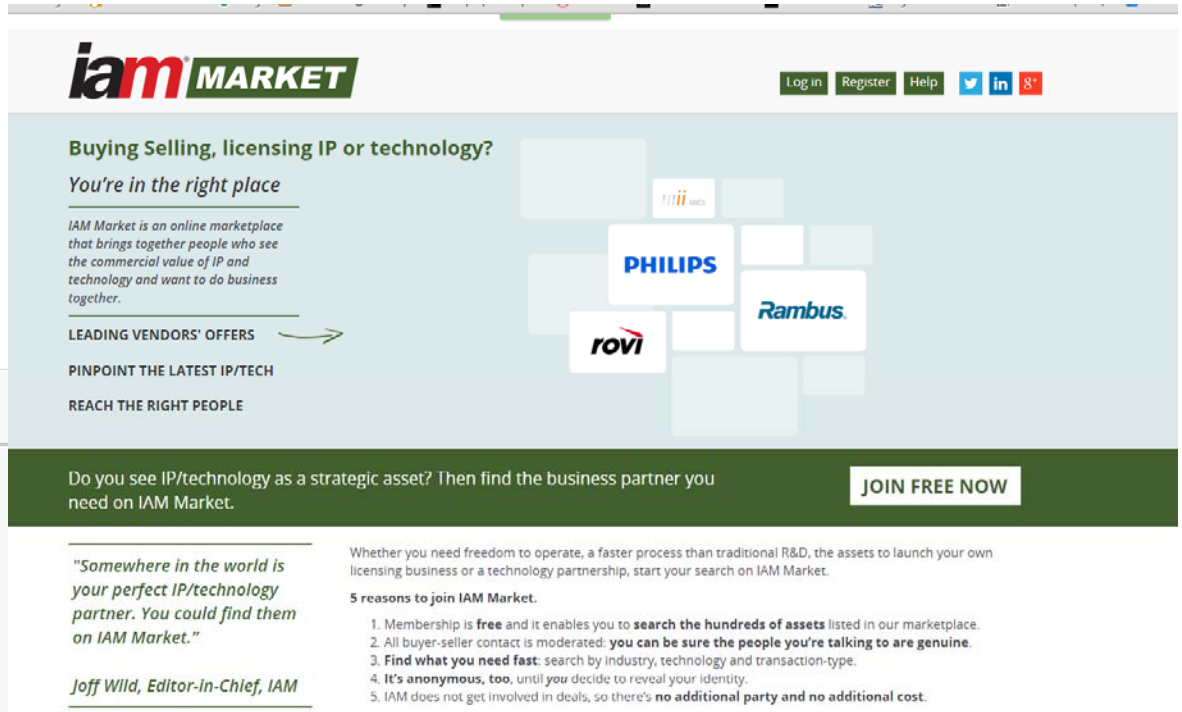
The Industry Patent Purchase Program (IP3) formed by Allied Security Trust, can best be described as a patent marketplace. The goal is to buy patents from owners and then offer them for sale to companies such as Google, Adobe, IBM, Verizon and others. The IP3 is also targeting patents in industries such as automotive, cloud computing and communications.

"*Our IP3 program is a first of its kind industry program designed to give sellers an easy way to access the secondary market by streamlining the process of selling patents*," said CEO of Ast, Russell W. Binns Jr in a press release. "*At the same time, it alleviates many of the problems associated with the secondary market by providing a* ***safe, transparent and rapid process*** *for all parties.*"

AST announced the results last week for the Industry Patent Purchase Promotion (IP3): IP3 made 56 offers to purchase 107 active patent filings at an average price per family of $96,000. The total expenditure was over $5.3 million with the purchase prices ranging from $10,000 to $325,000.

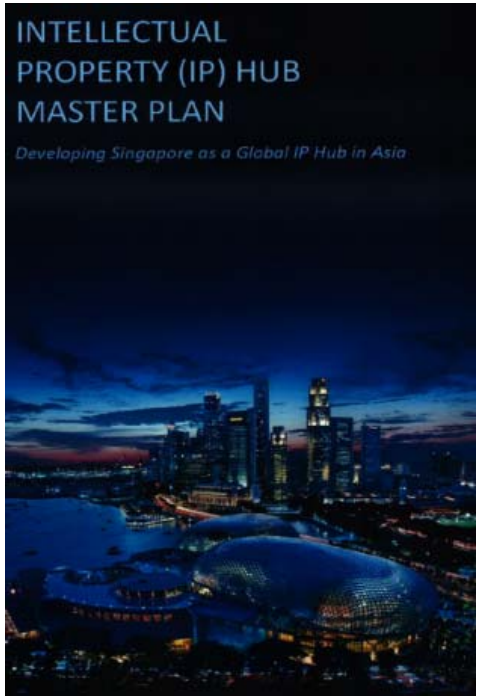
Creation of a market place by a reference IP review in October 2015





Vendors already online: Google, Hewlett-Packard, Rovi, Philips, AT&T, Freescale, Harman, NEC, Sony, Deutsche Telekom, Boeing, Rambus, IBM, Intel…

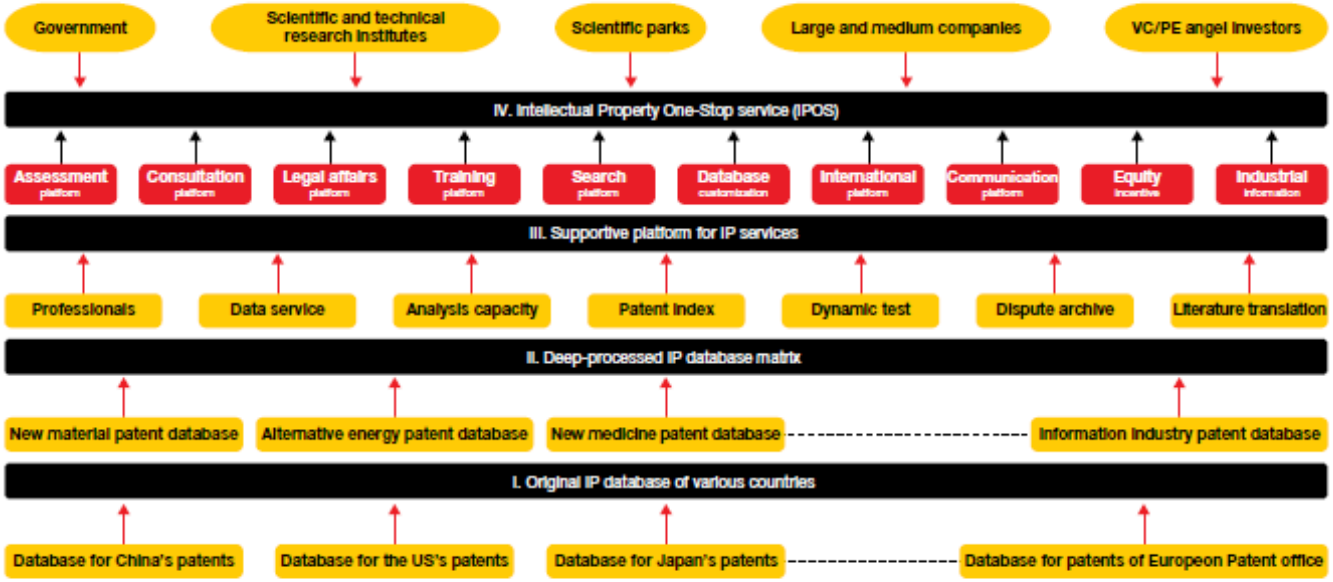
Other initiatives under development



Singapore IP Hub

CHINA TECHNOLOGY EXCHANGE

Figure 2. **China: Intellectual Property One-Stop Service**



Source: CTEX

- **"Strengthen our national capabilities to commercialise IP**…establishing dedicated **commercially-oriented entities** that are focused on the commercialisation of IP
- **Significantly grow the community of IP and commercialisation experts**
- **Develop a standardised IP protocol »**

https://www.gov.sg/microsites/future-economy/the-cfe-report/read-the-full-report

China: a growing network of IP funds and marketplaces

Chinese Government has Promoted IP Marketplaces for Transformation of Innovations

- At the beginning of 2016, the biggest fund of its kind nationwide—a government-led intellectual property fund **"Beijing key industry intellectual property fund"**—with a total planned capital of 1billion RMB ($153.3 million) was launched
- **NAST** (National Achievements of Science and Technology; www.nast.org.cn):
- **CTEX : China Technology Exchange** (www.ctex.cn) was set up by MOST, the State Intellectual Property Office, the Chinese Academy of Sciences, and Beijing Municipality. Supported by three platforms, i.e., on-line technology trading platform (www.ctexmll.com, claimed to be the largest platform in China), CTEX has satellite offices nationwide and 168 collaborating members.
- **CATTC** (China-ASEAN Technology Transfer Center; www.cattc.org.cn)

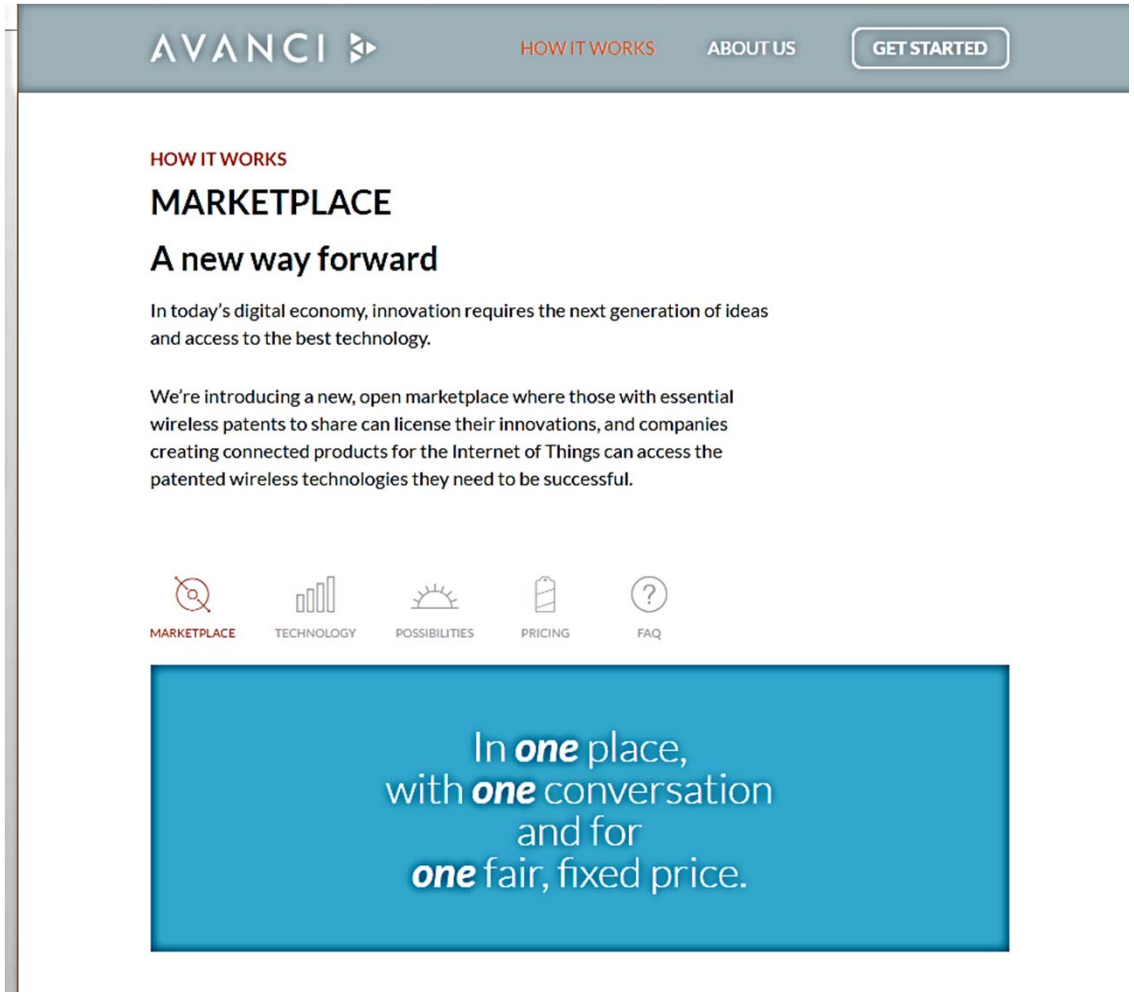
Regional :
- **NTEM** (Northern Technology Exchange Market (www.ntem.com.cn): was set up by Tianjing Municipality
- **STEE** (Shanghai Technology Transfer & Exchange; www.stte.sh.cn)

Private:
- **TIPEI** (Tianjing Binhai Intellectual Property Exchange International; www.tipei.net);
- **Ruichuan IPR Funds,** founded in April 2014, is a complex organization with government involvement corporation investment (XIaomi, TCL, Kingsoft), and professional operation (Zhigu Corp., specialized IP service firm). The fund is expected to reach a few hundred millions (RMB)

IoT: an imperative need for a market mechanism

Avanci: Ericsson and Qualcom's patent pool

Looking to speed time to market for "Internet of Things" products, Ericsson announced a new virtual marketplace for patent licensing across potential IoT verticals ranging from industrial applications to connected cars.
The company said the ***goal of the new marketplace****, which will be operated by an independent party, is to simplify access to standardized technology In an interview with RCR Wireless News, Alfalahi said the goal is to create a "****one-stop licensing platform" for IoT****.*
https://www.theregister.co.uk/2016/10/03/ericssons_patent_pool_is_far_from_the_new_start_the_iot_needs/



Qualcomm, Ericsson, ZTE, KPN, InterDigital and Sony

A first attempt to set up such a supermarket is the '*Librassay® – **Molecular Diagnostic Patent Supermarket***' (related to the molecular diagnostics industry), which is established by MPEG LA at the end of December 2012

https://www.librassay.com/

But these initiatives remain partial and limited

- **Auctions serve as a (useful) demonstration but not as regular market**
- **Pools work only on standard**
- **Aggregators and funds are reserved to members and have either a limited scope or a financial return goal**
- **Open platform**
  - **offer too few patents and no possibility to bundle patents**
  - **no price fixation**
  - **No due diligence or validity guarantee**

The patent market planet remains an archipelago without common rules that ensure the exchange to be “safe, transparent and rapid”

BANKING INITIATIVES

https://www.ipos.gov.sg/MediaEvents/Readnews/tabid/873/articleid/272/category/Press%20Releases/parentId/80/year/2014/Default.aspx

SINGAPOUR

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Singapore Launches S$100M Intellectual Property Financing Scheme & First One-Stop IP Service Centre

"Embracing Intellectual Property"

Singapore, 8 April 2014 – Today, Ms Indranee Rajah, Senior Minister of State for Law and Education, announced the roll-out of two new initiatives to help Singapore embrace Intellectual Property (IP). The announcement took place at the official opening of IP 101, the Intellectual Property Office of Singapore's (IPOS) new one-stop IP service centre.

2. A S$100 million Intellectual Property Financing Scheme will be launched to support local businesses to use their granted patents as collaterals for bank loans. Targeted at IP-rich and asset-light companies burgeoning in the technology sector, the scheme will open a new avenue for innovative companies to access capital so as to grow and expand.

« If the borrower defaults, the loan will be partially underwritten by the Singapore government, thus the liquidity of the patent assets on default is minimized"

How to Apply?

Three steps to apply for the IP Financing Scheme:

1. Approach any of the Participating Financial Institutions for a preliminary assessment
2. Appoint an IP valuer from the Panel of Valuers to determine the value of the portfolio of IP rights
3. Submit a formal application to the Participating Financial Institutions

To find out more about the application procedures, please contact IP ValueLab[3] through this form.

[3] *IP ValueLab is a subsidiary of the Intellectual Property Office of Singapore that is dedicated to help businesses compete globally through innovation. IP ValueLab assists both the businesses and the financial institutions to understand the business value of IP and to facilitate their application for the IP Financing Scheme using IP as loan collateral for finance.*

Our Partners

Participating Financial Institutions
- AFC Merchant Bank
- DBS Bank Ltd
- Oversea-Chinese Banking Corporation (OCBC) Ltd
- United Overseas Bank (UOB) Ltd

IPOS has established a panel of valuers to help local companies discover the worth of their intangible assets, such as patents, trade marks and copyright. Pick any one of the following companies to consult with:

Panel of Valuers
- Baker & McKenzie.Wong & Leow
- CONSOR Intellectual Asset Management
- Deloitte & Touche Financial Advisory Services Pte Ltd
- Duff & Phelps Singapore Pte Ltd
- Ernst & Young Solutions LLP
- EverEdge Global (NZ) Ltd
- KPMG Services Pte Ltd
- PricewaterhouseCoopers Advisory Services Pte Ltd
- Valuation Consulting LLP

https://www.ipos.gov.sg/IPforYou/IPforBusinesses/IPFinancingScheme.aspx

MALAISIE

Malaysia Debt Ventures Berhad (578113-A)
The Nation's Leading Technology Financier

Intellectual Property Financing Scheme

The government has recently introduced an initiative; Intellectual Property Financing Scheme (IPFS) to further inculcate innovation and increase productivity. The initiative of RM200 million in financing will be offered solely by MDV. The scheme will enable companies with IP rights (IPRs) to use their IPRs as an additional source of collateral to obtain funding and spur more investments for companies with technology capabilities, in turn encouraging innovation. The scheme will also help alleviate the difficulties that several technology-focused companies face when attempting to seek funding from financial institutions.

The key features of the scheme are as follows:

- Leveraging on MDV's strength as an innovative technology financier
- Financing of up to RM10 million or 80% of valued IP, whichever is lower
- 5 years financing tenure (inclusive of a grace period of up to 12 months)
- 2% p.a. interest/ profit equalization payment
- 50% guarantee provided by the Government of Malaysia and administered by Credit Guarantee Corporation Malaysia Berhad
- Applicable for all MDV financing products (except post-shipment)
- Discounted guarantee fee of 0.5% per annum
- Basic Requirements:
  - Registered & Valued IP
  - Meets MDV product criteria

Download brochure here

How to Apply?

- MDV Pre-Assessment Form

Recent News

- PNB lantik Zarinah, Awang Adek sebagai Ahli Lembaga Pengarah baharu

Contact U

Phone: +60
Fax: +60

http://www.mdv.com.my/en/product-services/government-schemes/intellectual-property-financing/

CHINA : “IP pledge financing” programme followed in 2008. According to *China IP News*, only 6 years later in 2014, SIPO reported that Chinese companies had secured over £6 billion GPB in patent-backed loans since the programme launched.

CHINE

iam

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Chinese company's $1.3 billion patent and trademark loan enters the IP deal pantheon

07 MAR 14

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Joff Wild

What could be one of the biggest-ever specifically IP-based transactions has recently been closed in China. According to the Conquering Innovation Fatigue blog, a trade publication called China Paper has reported that Quanlin Paper, a company based in the province of Shandong, secured a loan of RMB7.9 billion (approximately $1.3 billion) against a portfolio of trademark and patent rights.

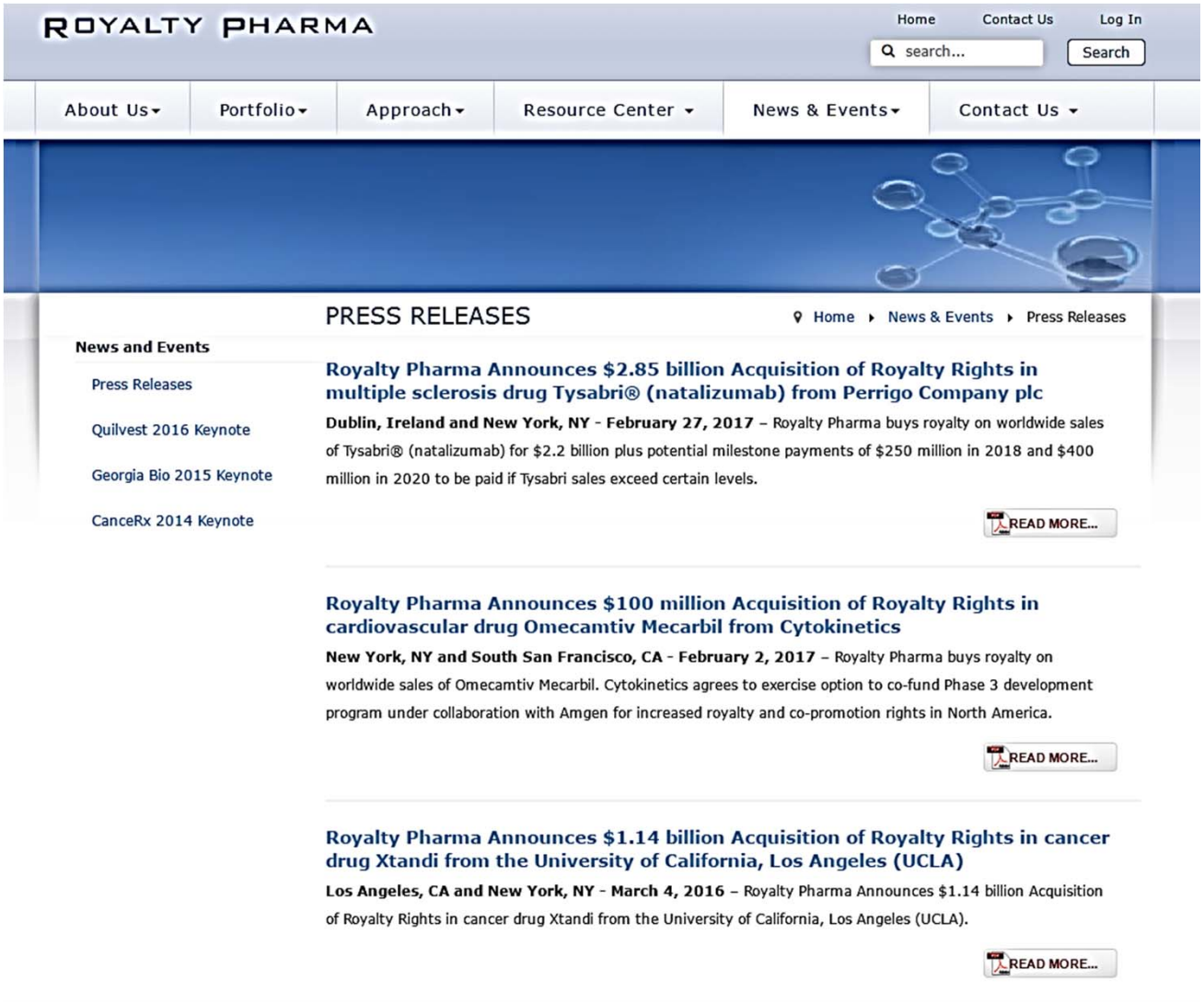
Virna Chung, *IAM*'s research manager in our Hong Kong office, has put together a rough translation of the article which you can see at the bottom of this blog. China Development Bank led the consortium which made the money available and the loan was secured against a portfolio of 110 patents and 34 trademarks. The patents alone were valued at RMB 6 billion, or close to $1 billion.

If these reports are accurate, the amount that Quanlin has secured is among the largest known sums that an IP portfolio has directly generated in a transaction. Of course, most deals are not disclosed so we cannot know where it stands in the all-time hierarchy, but looking at recent transactions whose details have been made public we can say that Quanlin is right up there. Off the top of my head, I can think of the following in descending order in terms of size:

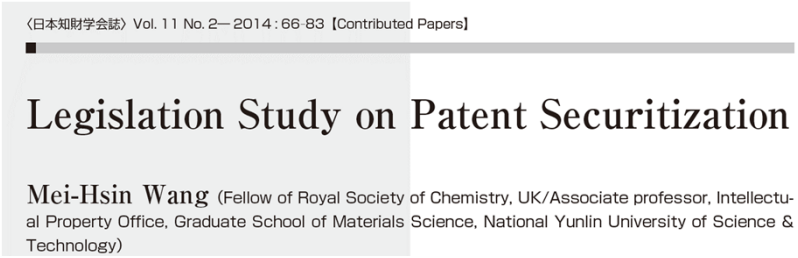
http://www.iam-media.com/blog/Detail.aspx?g=481b76b6-637f-427f-b8d6-78d06cece504

“In summary, patent-backed debt finance has arrived in Asia and lenders in the UK and around the world should sit up and take notice” (Banking on IP? UK¨PTO)

Securitisation



https://www.royaltypharma.com/press-releases/


〈日本知財学会誌〉Vol. 11 No. 2— 2014 : 66-83【Contributed Papers】

Legislation Study on Patent Securitization

Mei-Hsin Wang (Fellow of Royal Society of Chemistry, UK/Associate professor, Intellectual Property Office, Graduate School of Materials Science, National Yunlin University of Science & Technology)

https://www.ipaj.org/english_journal/pdf/11-2_Wang.pdf

Different types of innovation
The traditional classification: product, process, new market, marketing, organizational

Innovation modes
Mode 1: 'IP/technology innovating'
Mode 2: 'Marketing based innovating'
Mode 3: 'Process modernising'
Mode 4: 'Wider innovating'
Mode 5: 'Networked innovating'

Frenz, M. and R. Lambert (2012), "Mixed Modes of Innovation: An Empiric Approach to Capturing Firms' Innovation Behaviour", OECD Science, Technology and Industry Working Papers, 2012/06, OECD Publishing. http://dx.doi.org/10.1787/5k8x6l0bp3bp-en

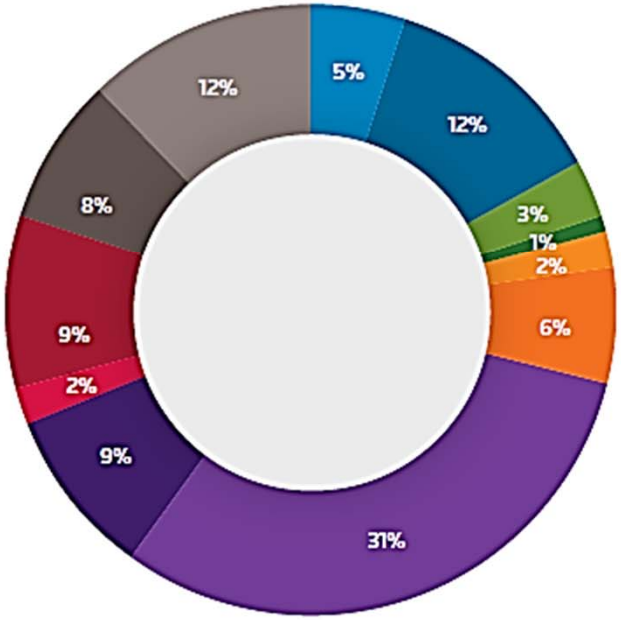
Existing (one-dimensional) typologies are being challenged by new approaches to developing innovation typologies which explicitly focus on the multidimensional facets or aspects of innovation strategies/routines
(i) IP/technology innovating which contains at its core IPRs, and in many countries this is complemented by in-house R&D and new-to-market activities;
(ii) marketing based innovating which includes forms of product innovation, leaning towards new-to-firm imitating, with marketing expenditures for the introduction of innovations;
(iii) process modernising which links process innovations with equipment spending and training;
(iv) wider innovating with combinations of management and business strategy changes, including new sales and distribution methods; and
(v) networked innovating involving bought-in R&D or licences and formal collaboration and leaning towards accessing information from universities.

Innovation varies across sectors – but also with definition

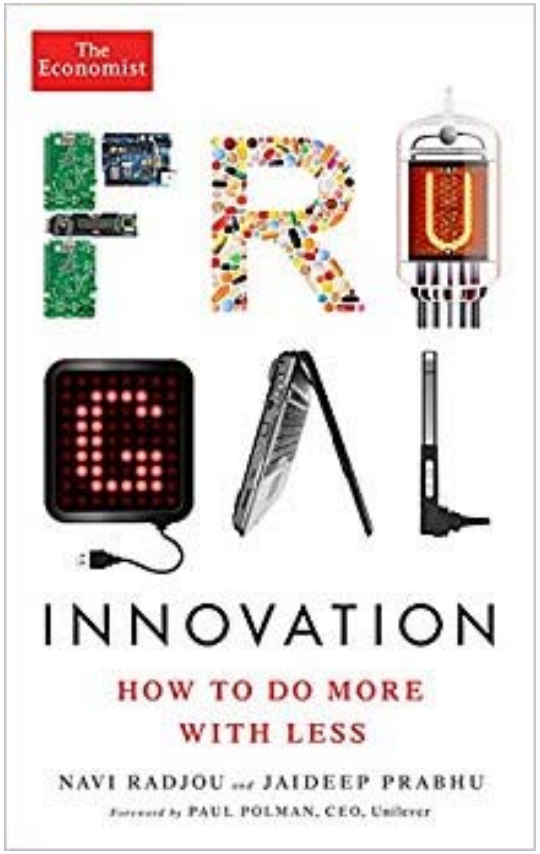
Overall View of Innovation

%	Industry	2015 Volume	2014 Volume	% Change
5%	Aerospace & Defense	71,633	62,162	15%
12%	Automotive	166,867	153,872	8%
3%	Biotechnology	41,624	42,584	-2%
1%	Cosmetics & Well Being	11,307	11,017	3%
2%	Food, Beverage & Tobacco	26,605	26,333	1%
6%	Home Appliances	86,301	71,278	21%
31%	Information Technology	429,806	380,325	13%
9%	Medical Devices	118,658	93,462	27%
2%	Oil & Gas	27,556	24,158	14%
9%	Pharmaceuticals	116,286	111,479	4%
8%	Semiconductors	114,488	110,761	3%
12%	Telecommunications	166,601	161,739	3%

Source: Derwent World Patents Index



State of innovation, 2016, Thomson Reuter (measure by patent)



And across countries and location

12 countries. Just two countries account for 73 percent of the list — Japan and the US — making them the major innovation hubs of the world. The perennial countries of France, Germany, South Korea, Netherlands, Sweden, Switzerland, Ireland and Taiwan are joined this year by mainland China for the second time and Finland for the first.

Figure 1: Composition of the 2016 Top 100 Global Innovators

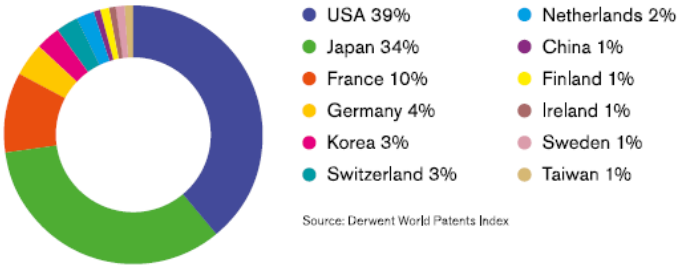
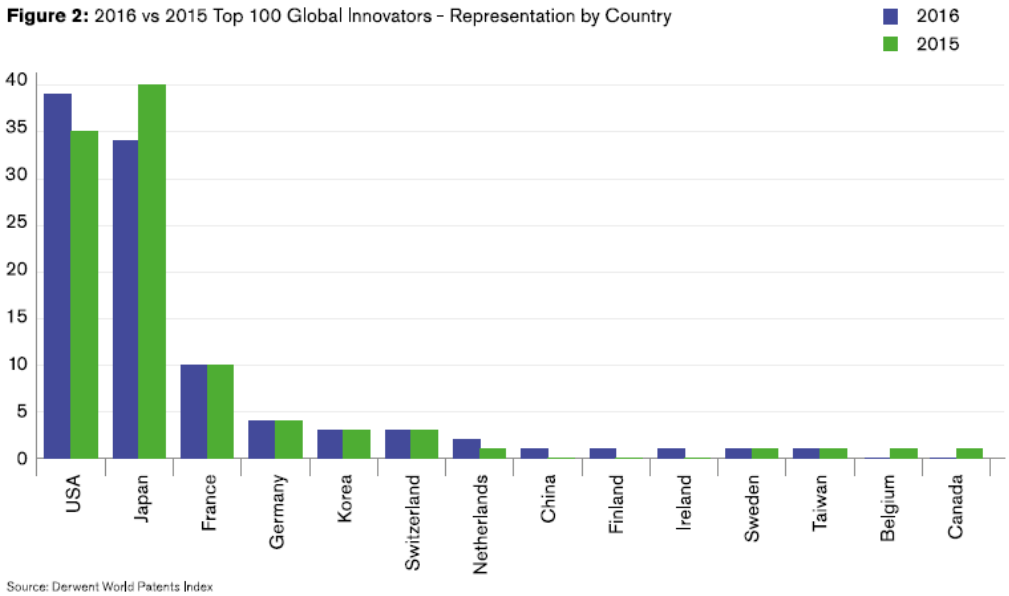
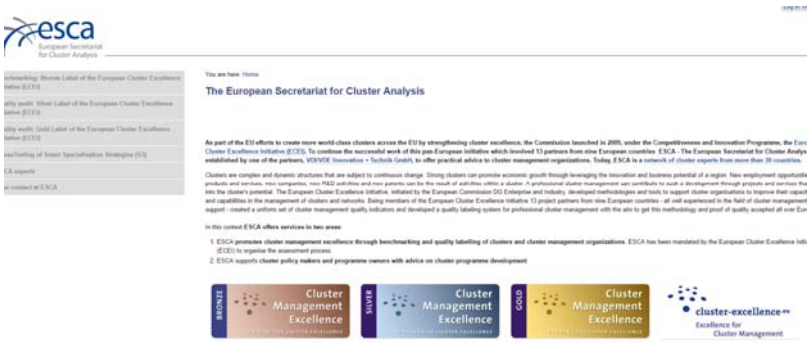


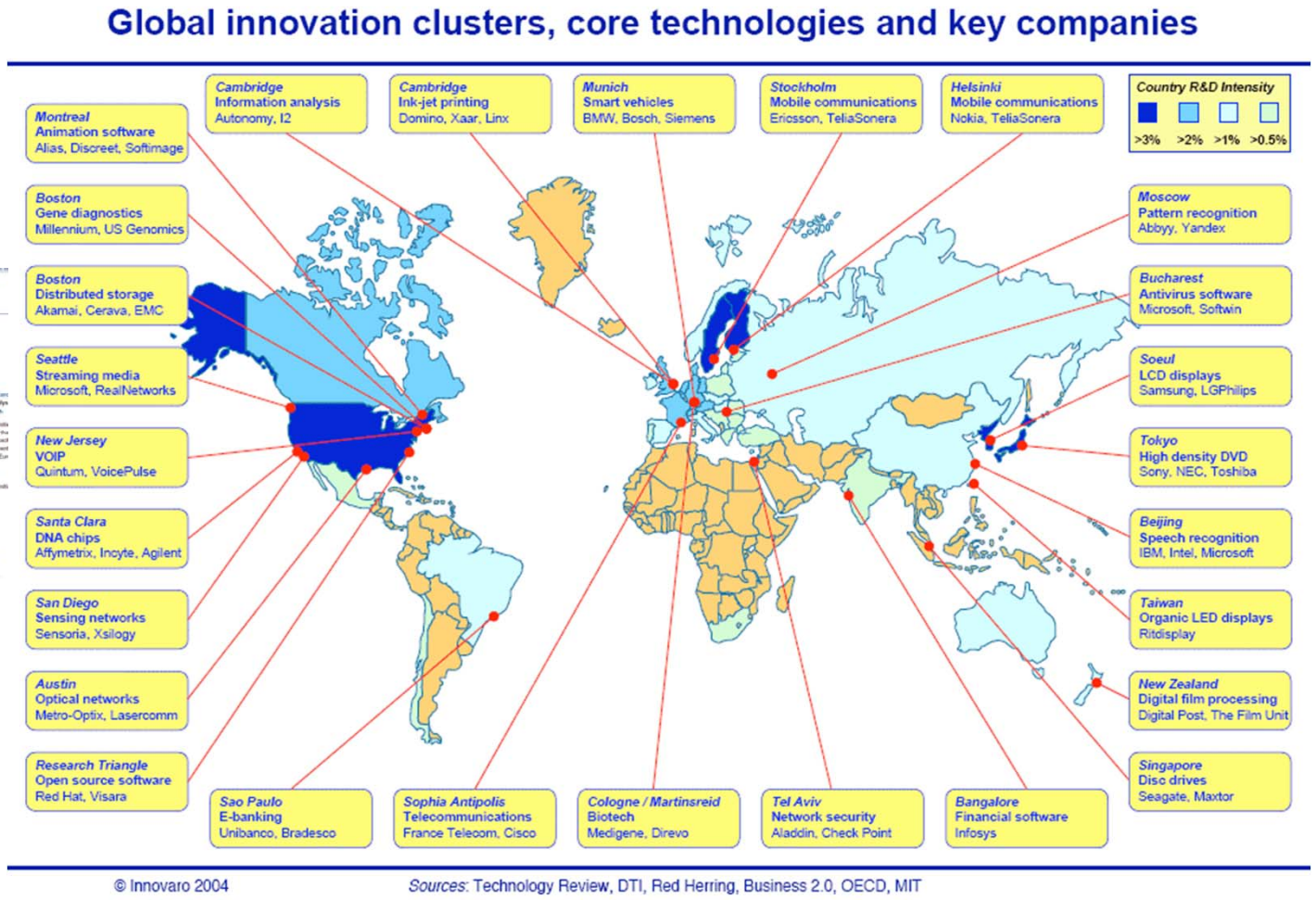
Figure 2: 2016 vs 2015 Top 100 Global Innovators - Representation by Country

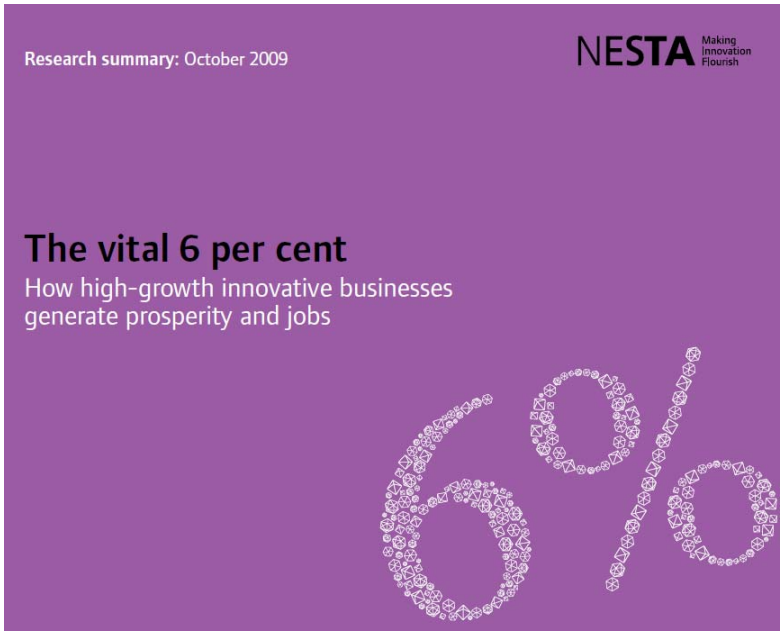


2016, Top 100 global innovators, Clarivate Analytics

The cluster effect







"*Although these companies came from across the country and from all sectors of the economy, they had one important factor in common: they were far more likely to be innovative, and the research shows that their innovation was a source of growth*."

Reconciling the Firm Size and Innovation Puzzle

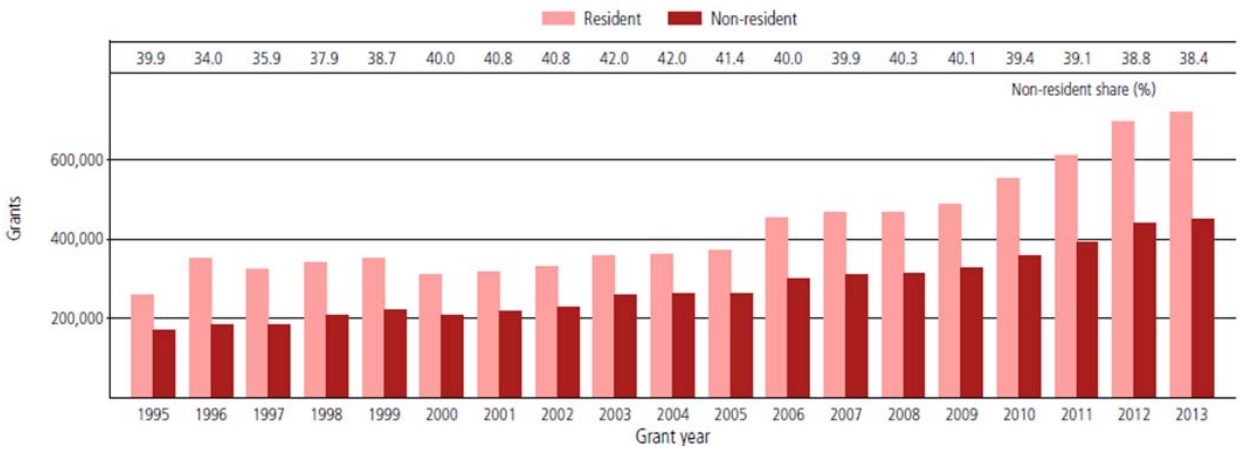
US Census Bureau Center for Economic Studies Paper No. CES-WP- 16-20

Anne Marie Knott, , Carl Vieregger, 3 Apr 2016

Since Schumpeter, there has been a long-standing debate regarding the optimal firm size for innovation. Empirical results have settled into a puzzle: R&D spending increasing with scale while R&D productivity decreases with scale. Thus large firms appear irrational. We propose the puzzle stems from the fact that product and patent counts undercount large firm innovation. To test that proposition we use recently available NSF BRDIS survey data of firms R&D practices as well as a broader measure of R&D productivity. Using the broader measure, we find that both R&D spending and R&D productivity increase with scale — thus resolving the puzzle. We further find that while large firms and small firms differ in the types of R&D they conduct, there is no type whose returns decrease in scale — there are merely types for which the small firm penalty is less severe.

Conquering strategies: the tool of patent filing to expand market share

A4 Resident and non-resident patent grants worldwide



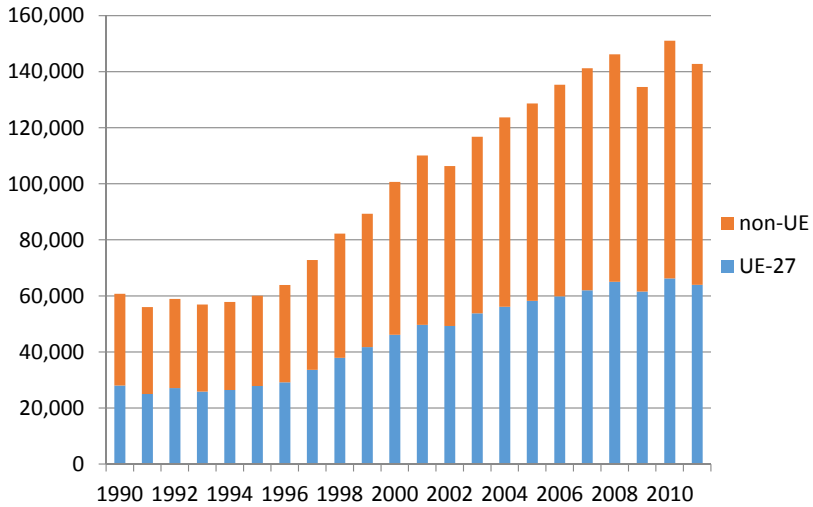
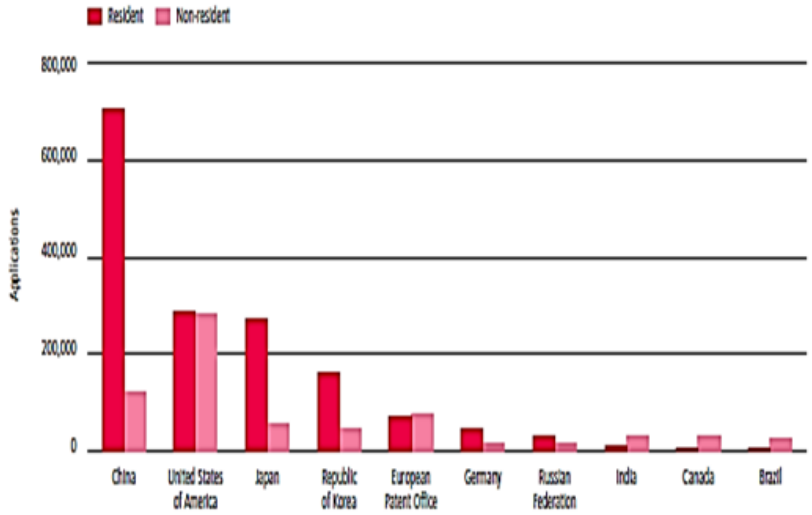


Figure 2. Patent applications at the top 10 offices, 2013



Source: Standard figure A8.

Biotech exchange platform

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Patent Licensing Supermarket

- Goals
  - Remove patent obstacles
  - Enable researchers, laboratories and testing companies to design comprehensive diagnostic tests
  - Make such tests widely available to the public
  - Enable market/clinical practice to set the standard
- Same goals apply to research tool manufacturers
- Solution: a new licensing model that facilitates technology dissemination and use, and balances benefits to society with rewards to IP owners

Librassay® - What Is It?

- A web-based store of molecular diagnostic and research tool patent rights
- Supports molecular diagnostics, personalized medicine, and research tool industries
- Customizable Supermarket: users select what they need to design multiplex tests and research tools (including whole genome/exome)