Patents in the Knowledge-Based Economy

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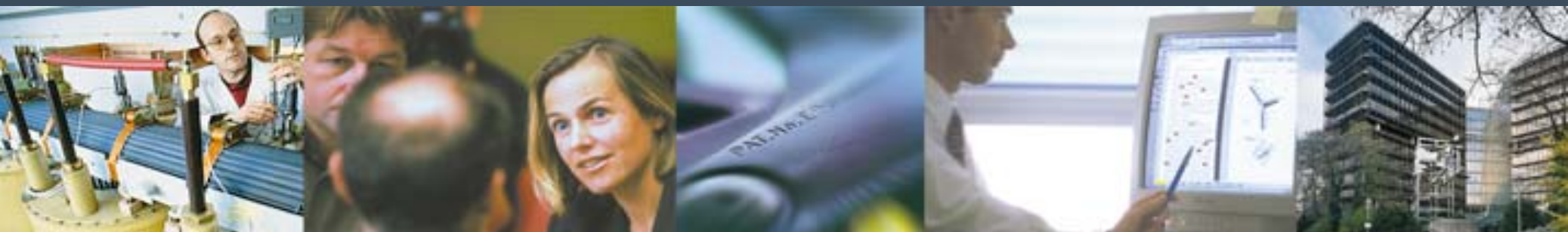
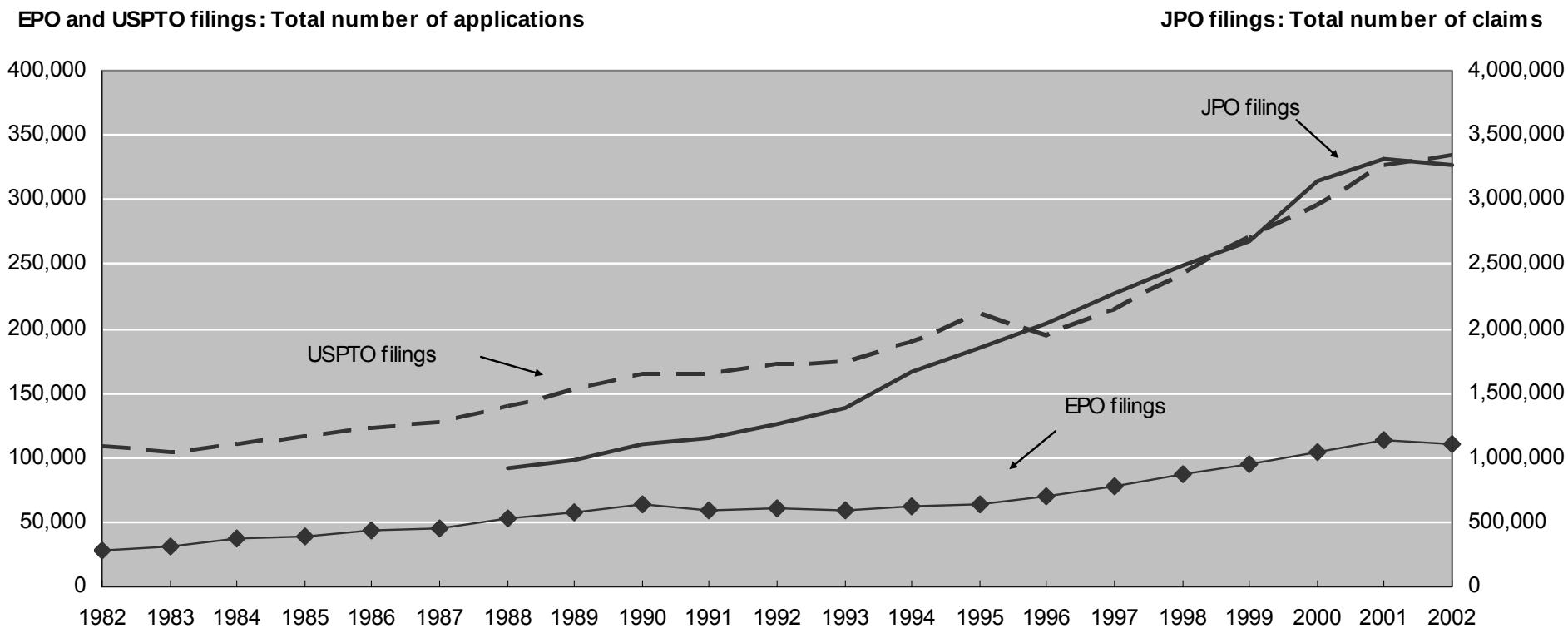


Outline of the presentation

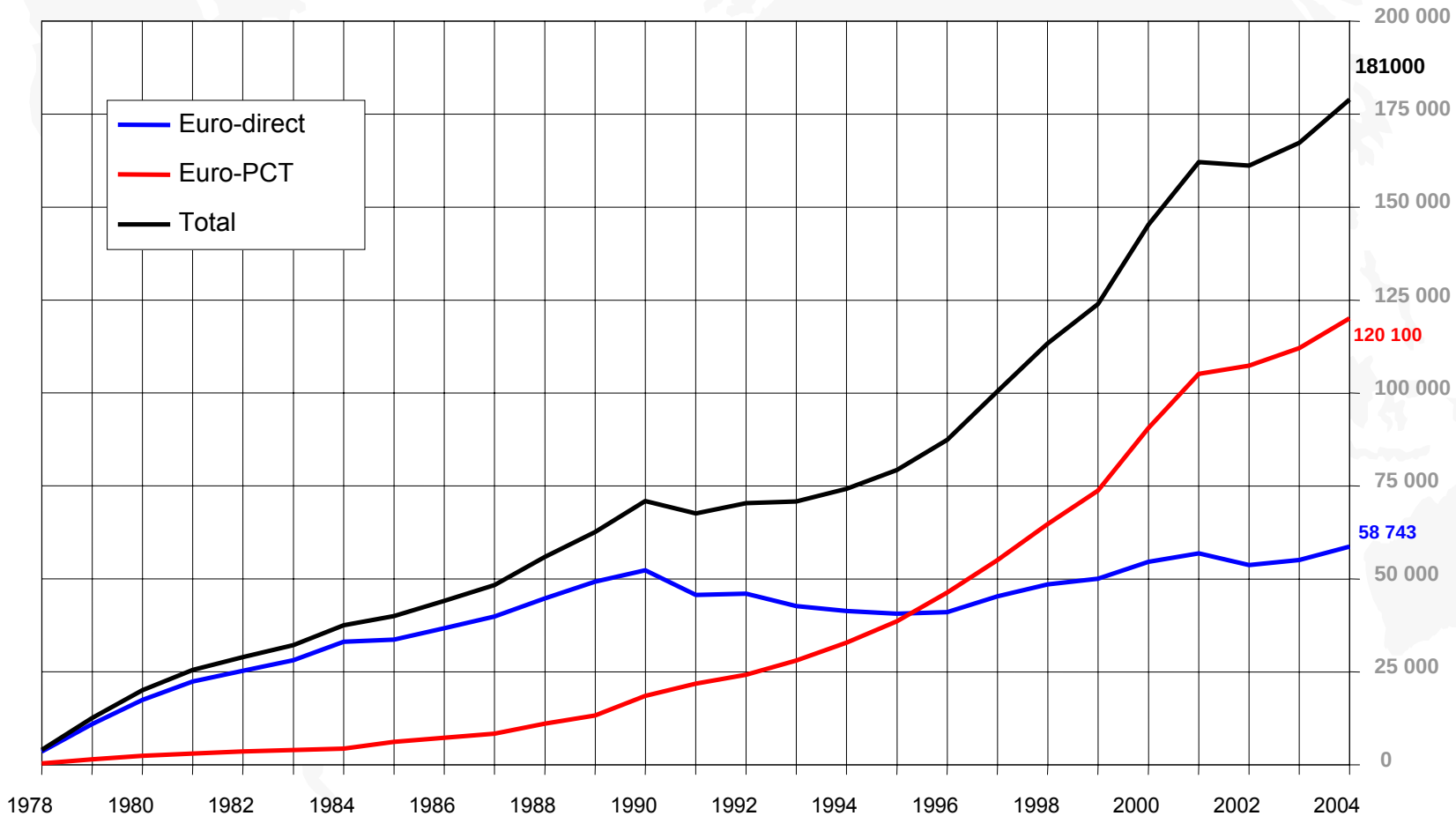
1. Recent evolutions in patent numbers
2. The new roles of patents in the economy
3. The economics of patents
4. Current challenges for the patent system

Ever more patents



Surge in filings to the EPO

Applications to EPO (2005: + 5%))



The surge in patent numbers

Patent filings have doubled in OECD over the past decade. It is the sharpest increase since the 1870s in the US.

... What happened?

The surge in patent numbers

=> *Major sources of the surge:*

- increased innovation: Emergence of new technology areas (software, biotech);
- strengthened role of patents in competitive processes;
- changes in patent regimes.

The surge in patent numbers

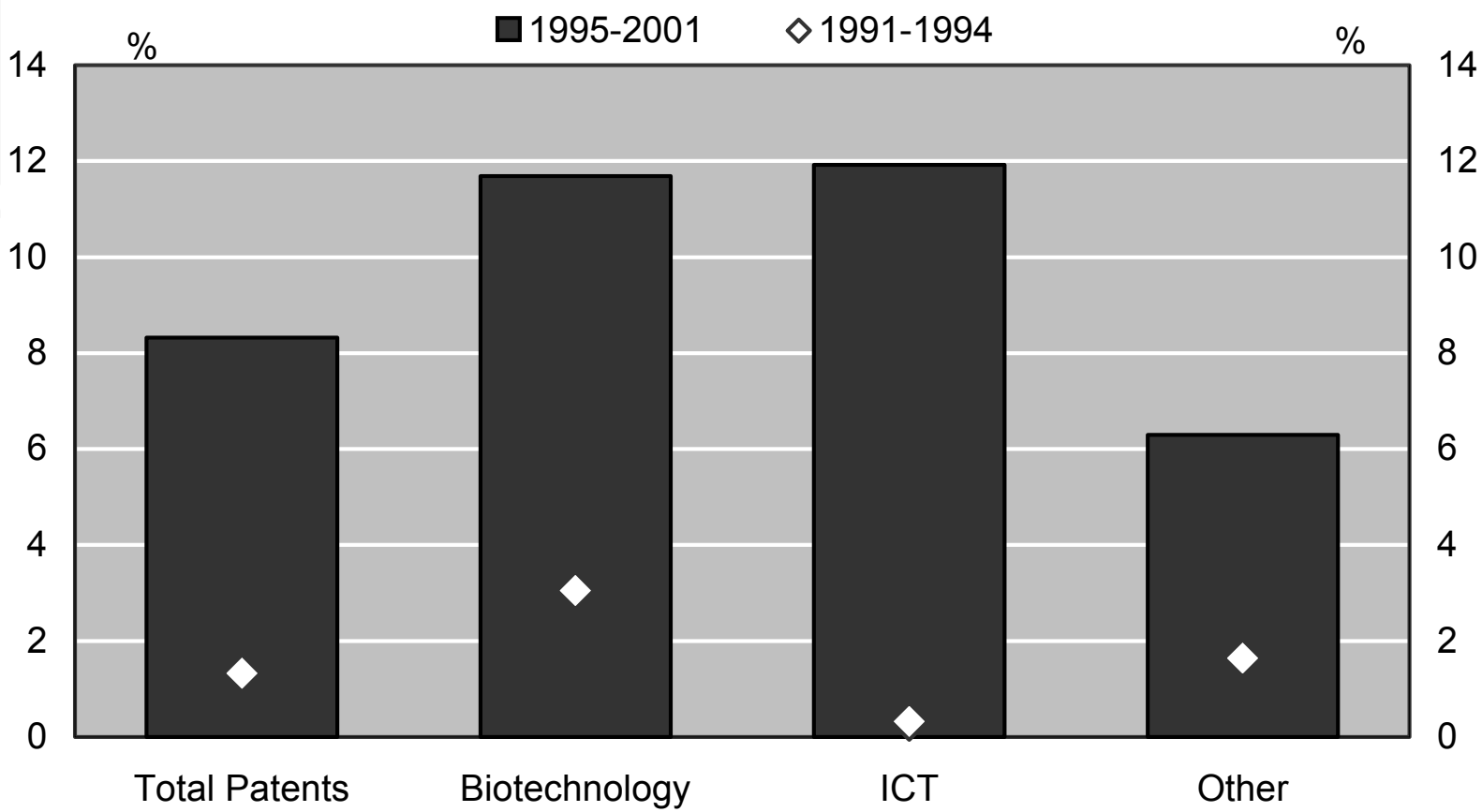
Corresponds first with a surge in innovation:

- Sharp increase in business R&D expenditure notably in the US, during the 1990s

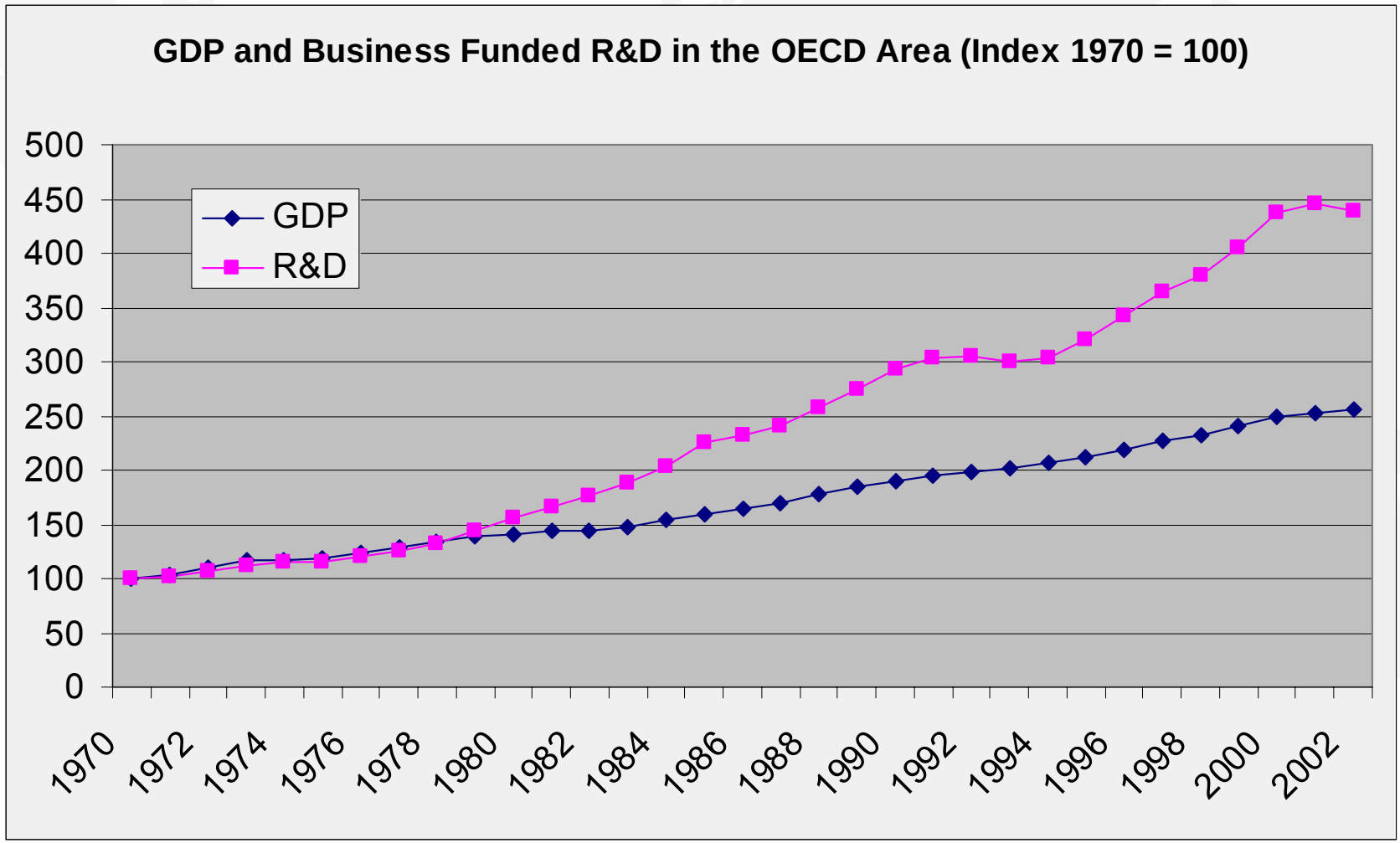
- ICT and biotechnology contributed to 50% of the surge: It is also areas where R&D expenditure grew most rapidly and innovation was more spectacular.

Growth in applications filed to EPO

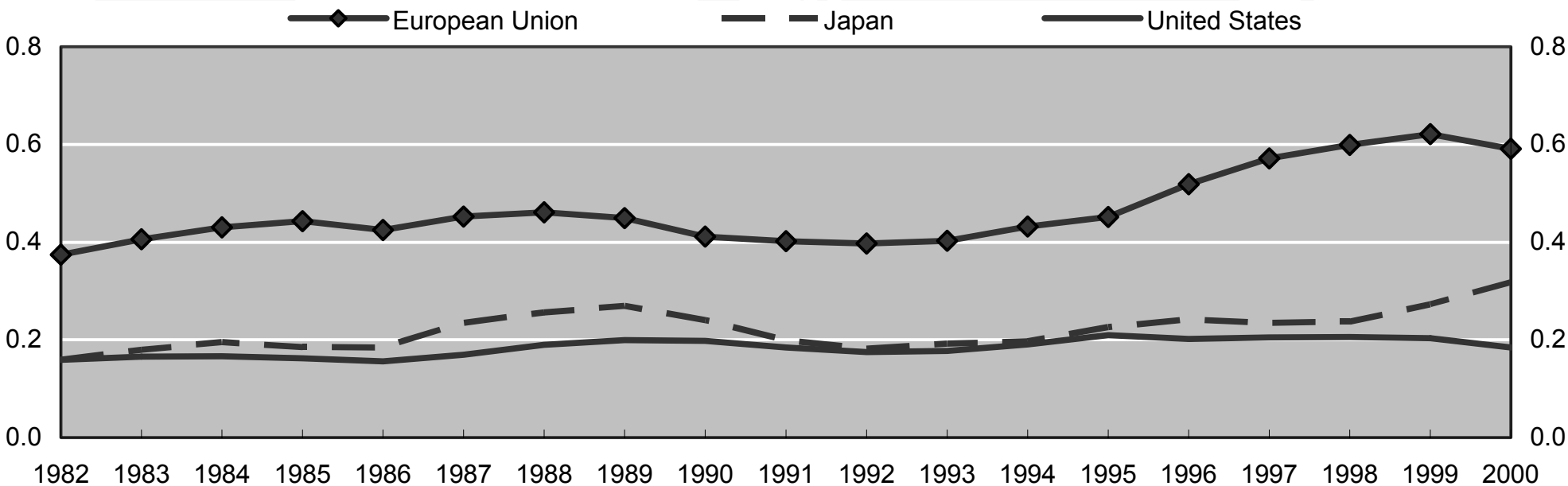
(compound annual growth rate)



Growth in Business funded R&D



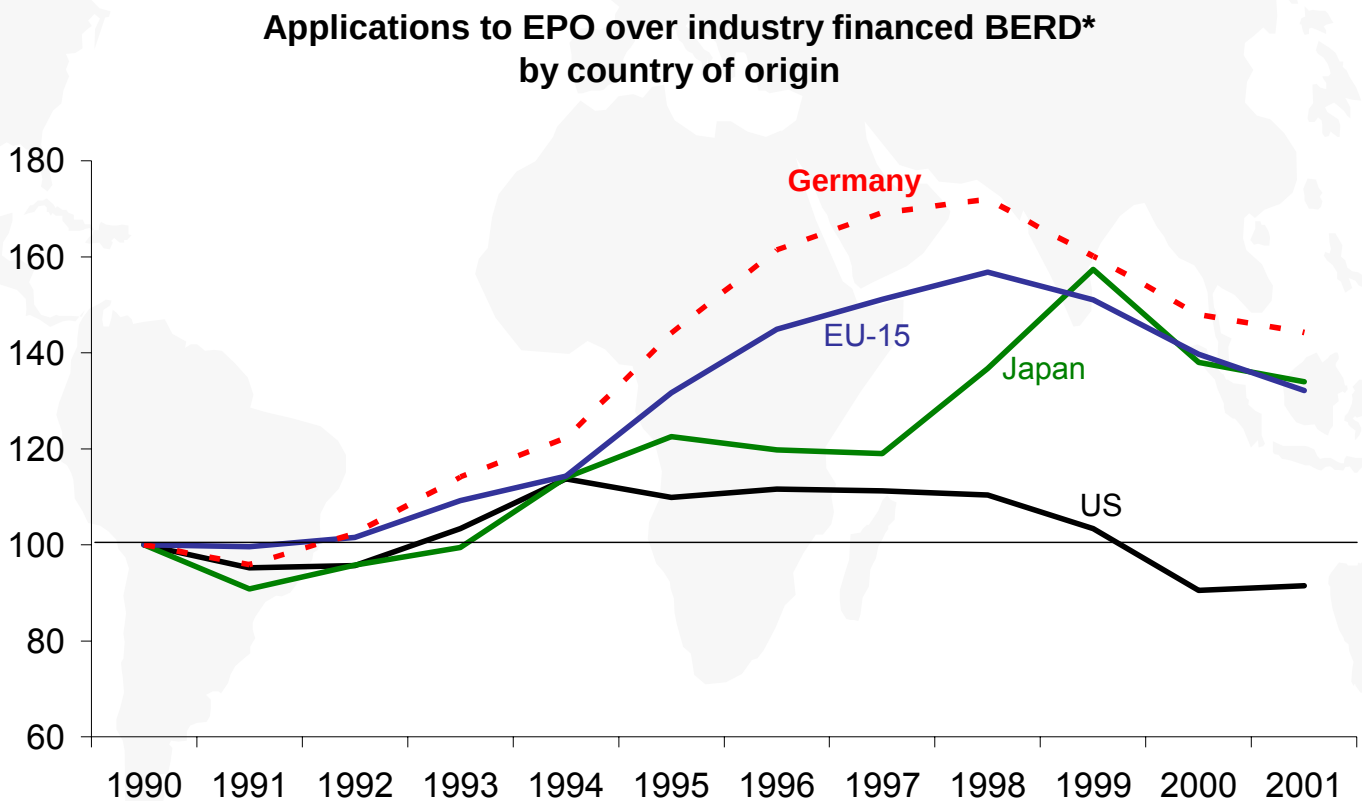
EPO applications per dollar R&D



More than a surge in innovation

Patent per dollar-R&D increased in most countries, or was stable in front of a long term decline => increased innovation explains part of the surge in patenting, but far from all of it.

Patents per R&D Dollar



Changes in innovation systems enhance the role of patents

- Innovation is central to business strategy.
- More competitive, globalised markets.
- More co-operation between firms.
- Increased importance of start-ups, with no other asset than their technology.
- Expansion of markets for technology (esp. licensing contracts).

=> *businesses require more patenting for protecting their inventions and dealing with other companies.*

More competitive and globalised markets

Deregulation => more intense competition;
Competition induces patenting (≠ national monopolies did not need much IP as they had little potential imitators); e.g. telecoms.

Globalisation: larger and more differentiated markets as products are sold world-wide, more competition as national borders do not keep foreign companies away.

More cooperation in innovation

Innovation used to be mainly done in-house, centred on the firm: It is now more based on knowledge networks and markets.

Companies are increasingly specialised (vertically, horizontally), they cannot rely on their own competencies only for inventing new, complex products: need to pool innovation through research joint ventures and other types of cooperative agreements and networks

=> need to be protected = role of patents

Increased importance of start-ups

In emerging technology fields (IT, software, biotech, nanotech) much innovation come from start-ups: companies with no other asset than their technology (no complementary assets that can be used as indirect protection) => need to protect their technology = IP

“Fabless” companies in semiconductors.

Biotech companies being taken over by big pharmas.

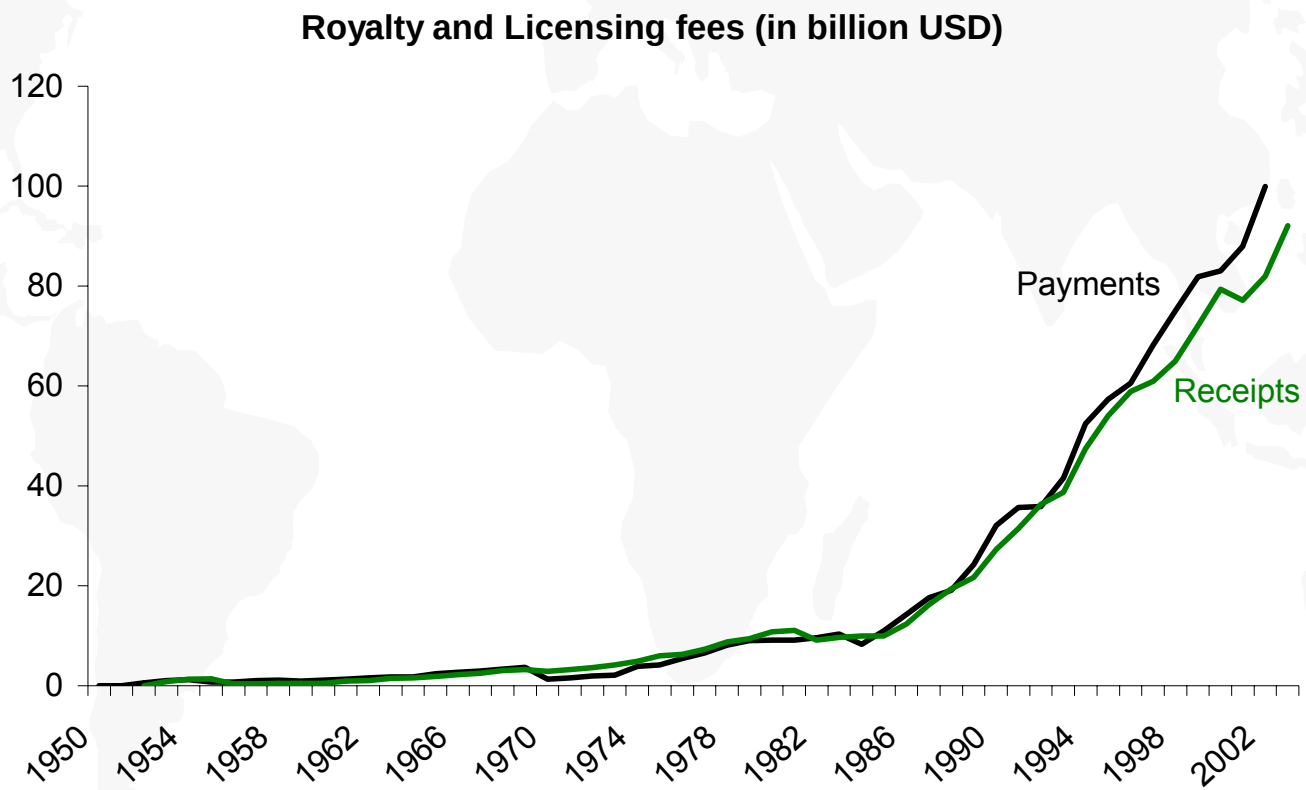
Venture capitalists require patents before committing funds.

Expansion of markets for technology

- Market transactions related to technology, notably licensing agreements, are expanding.
- Active policy by many large and small companies to sell their technology (IBM = 1.5 Billion USD a year in licensing revenue, Microsoft now)

  ... “Rembrandts in the Attic”
- Securitisation of IP (emerging)

Broadened range of ways to create value from patents => increased incentives to file patents.



Source: Athreye and Cantwell 2005

Strengthened patent regimes world-wide

- Strong pro-patent policy by government in OECD countries, which believe that patents favour innovation (started with the US)

  e.g. Bayh-Dole types of policies.
- Active policy by the US (followed by the EU and Japan) to promote their interest world-wide (TRIPS, bilateral agreements)

Strengthened patent regimes world-wide

- Upward harmonisation of patent regimes world-wide (TRIPs, 1994).
- More powerful governing bodies (e.g. WTO, central courts specialised in IP = CAFC, JP IP High Court, EPO).
- Enforcement is strengthened (increased damages).
- Expanded subject matter: biotechnology, software, business methods (cross-countries differences).
- Narrowing research exemption in the US.
- Bayh-Dole act types of policies

Economics of patents

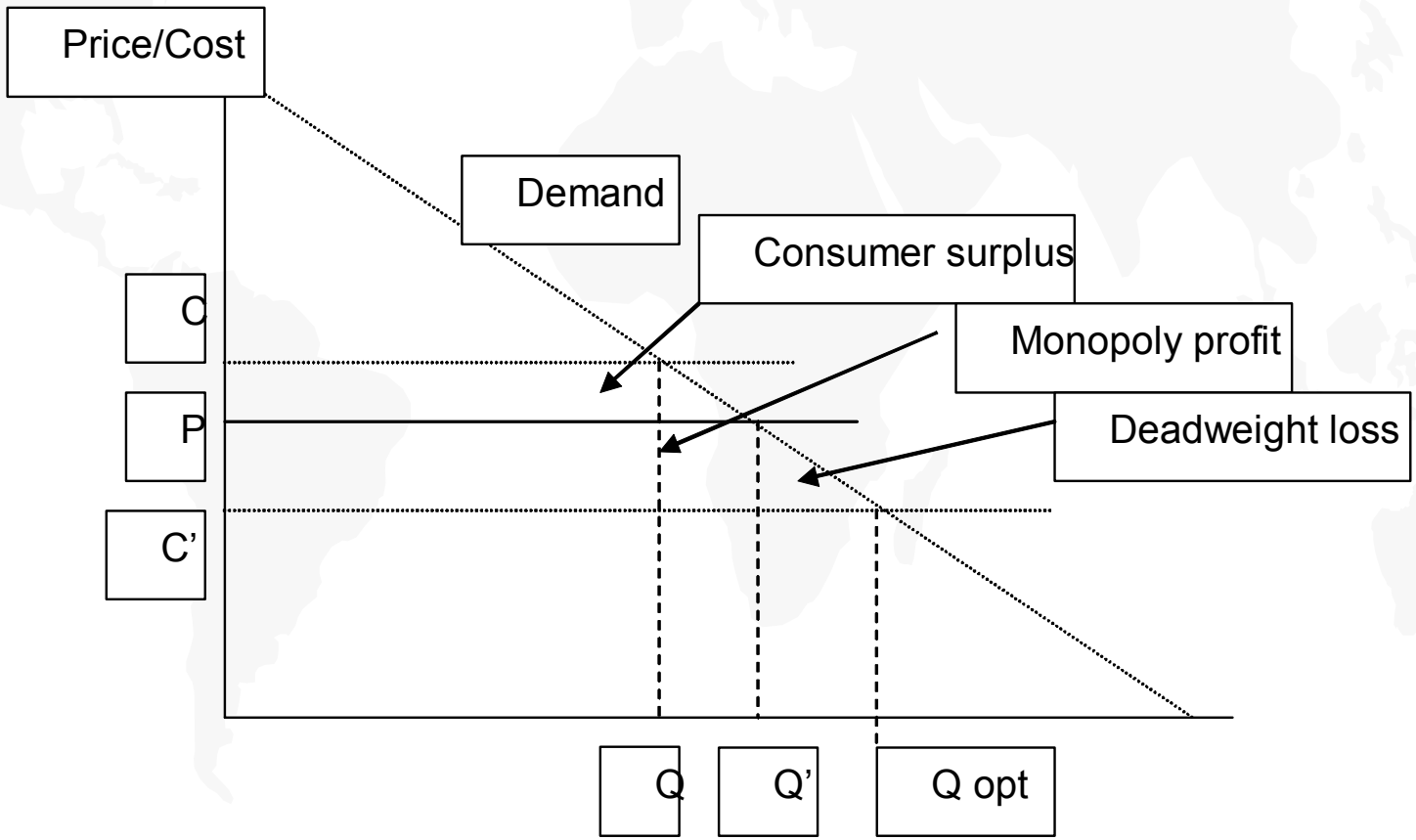
Expected effects of patents:

- Generate a rent which will incentivise innovation.
- Disclose inventions which would otherwise be kept secret.

But:

- Deadweight loss for consumers (static effect).
- Barrier to accessing disclosed knowledge.

Deadweight loss



A good patent system...

... is one which maximises the positive effects while minimising the negative ones:

- Incentivises invention.
- Minimises deadweight loss and barriers to access to knowledge.
- and facilitates further uses of technology: licensing, finance etc.

Current challenges to the patent system

- Maintaining and adapting quality in the new context
- Encouraging the development of technology markets

Quality

Meaning of quality: Only those patents which are good for the economy (invention, diffusion) should be allowed =>

- Selectivity of the process
- Reduce delays in the procedure
- Monitor voluminosity of patents

Selectivity

Only patents which contribute to invention activities should be granted, and with a scope which does not makes it to difficult further use of the patented knowledge.

=> increased workload of patent offices

=> adapting rapidly standards and practice to new fields (biotech, CII, nanotech)

Are there too many patents in the world?

Backlog

The number of un-examined applications is more than 600.000 in Europe, in Japan and in the US (each), end of 2005

=> uncertainty for applicants themselves

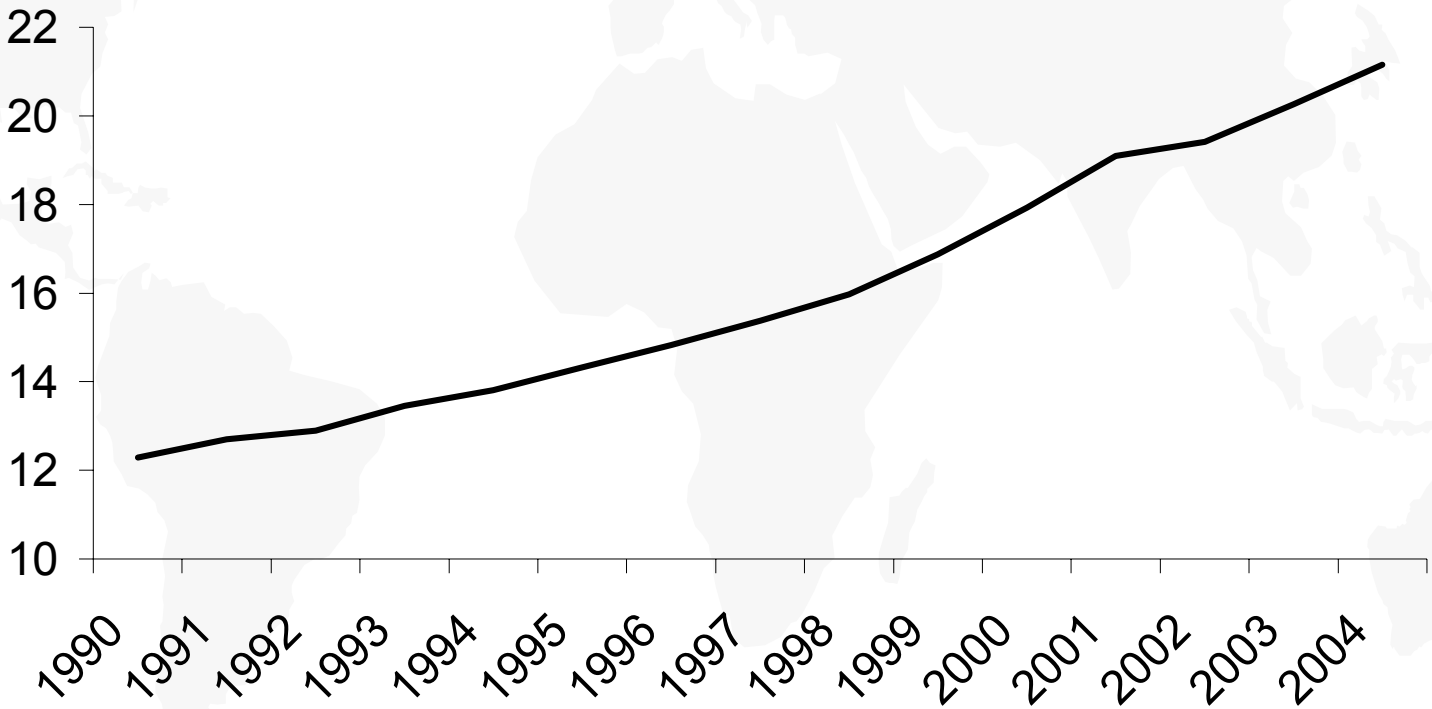
=> unchecked titles which gives already substantial rights to their holder

Voluminosity

Patent applications and grants are not only more and more numerous, but each of them is increasingly "big" = number of pages, number of claims.

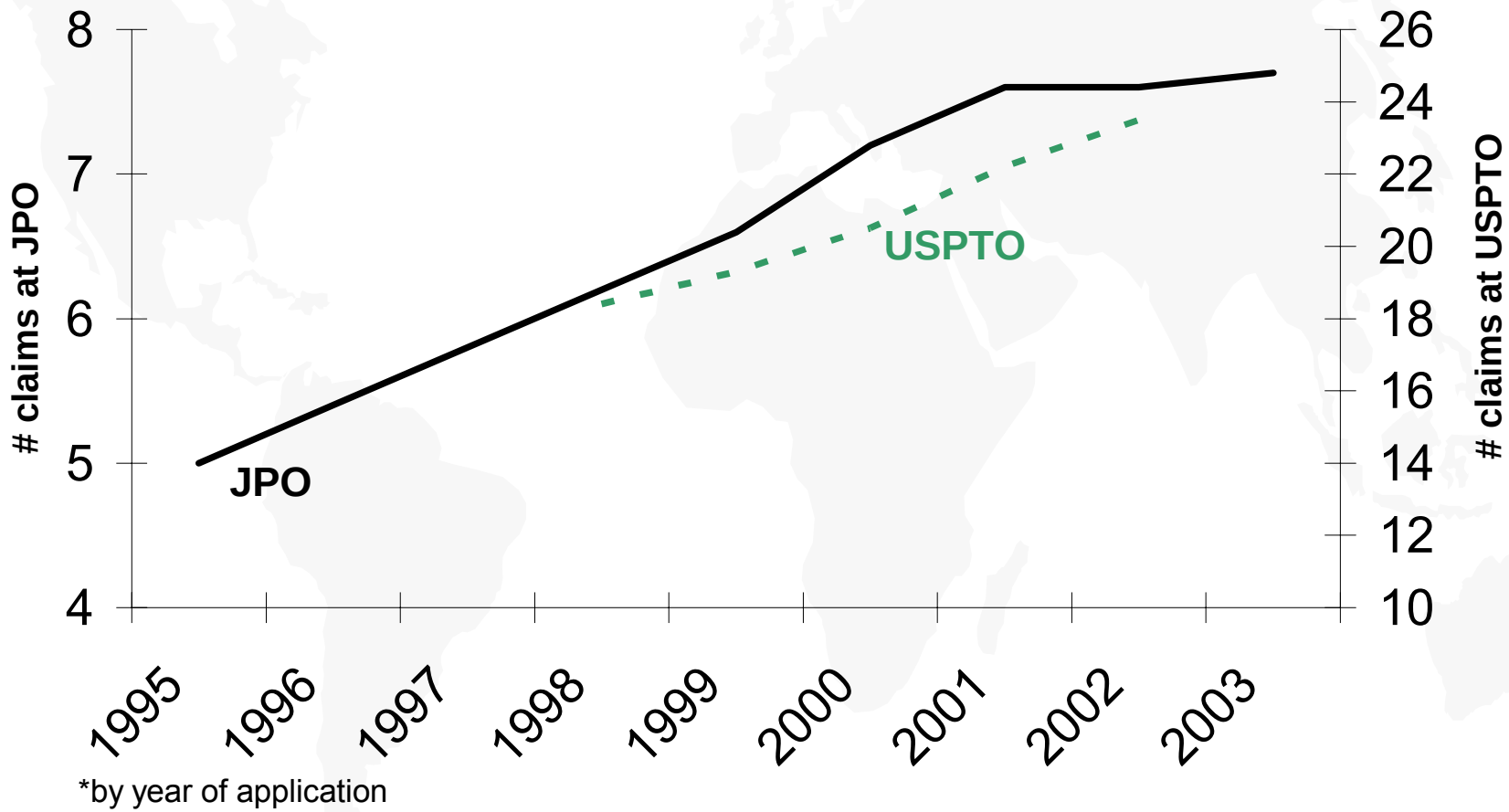
Voluminosity

Avg. number of claims per application received by EPO*



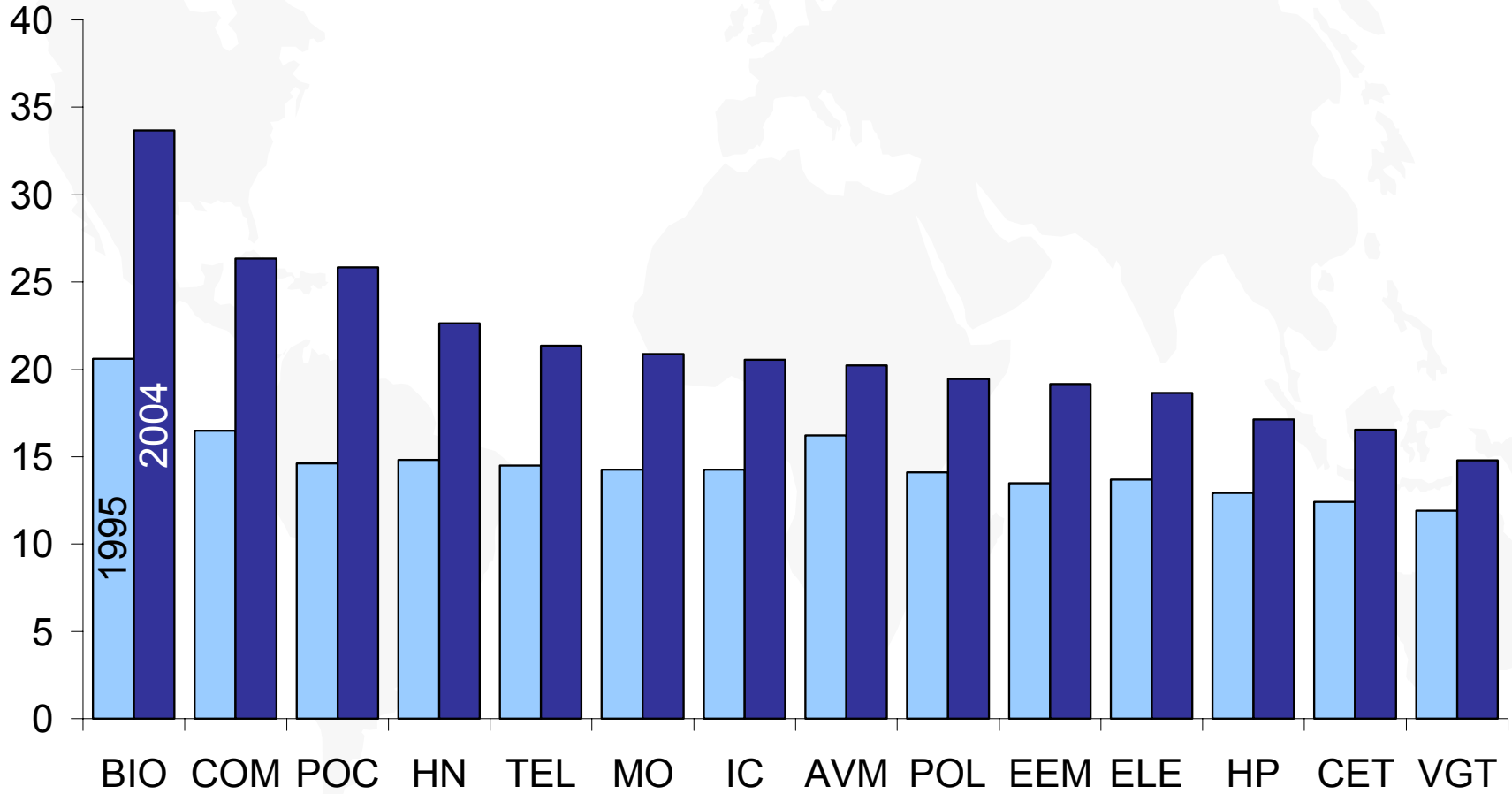
*by year of application

Avg. number of claims per application received by JPO and USPTO*

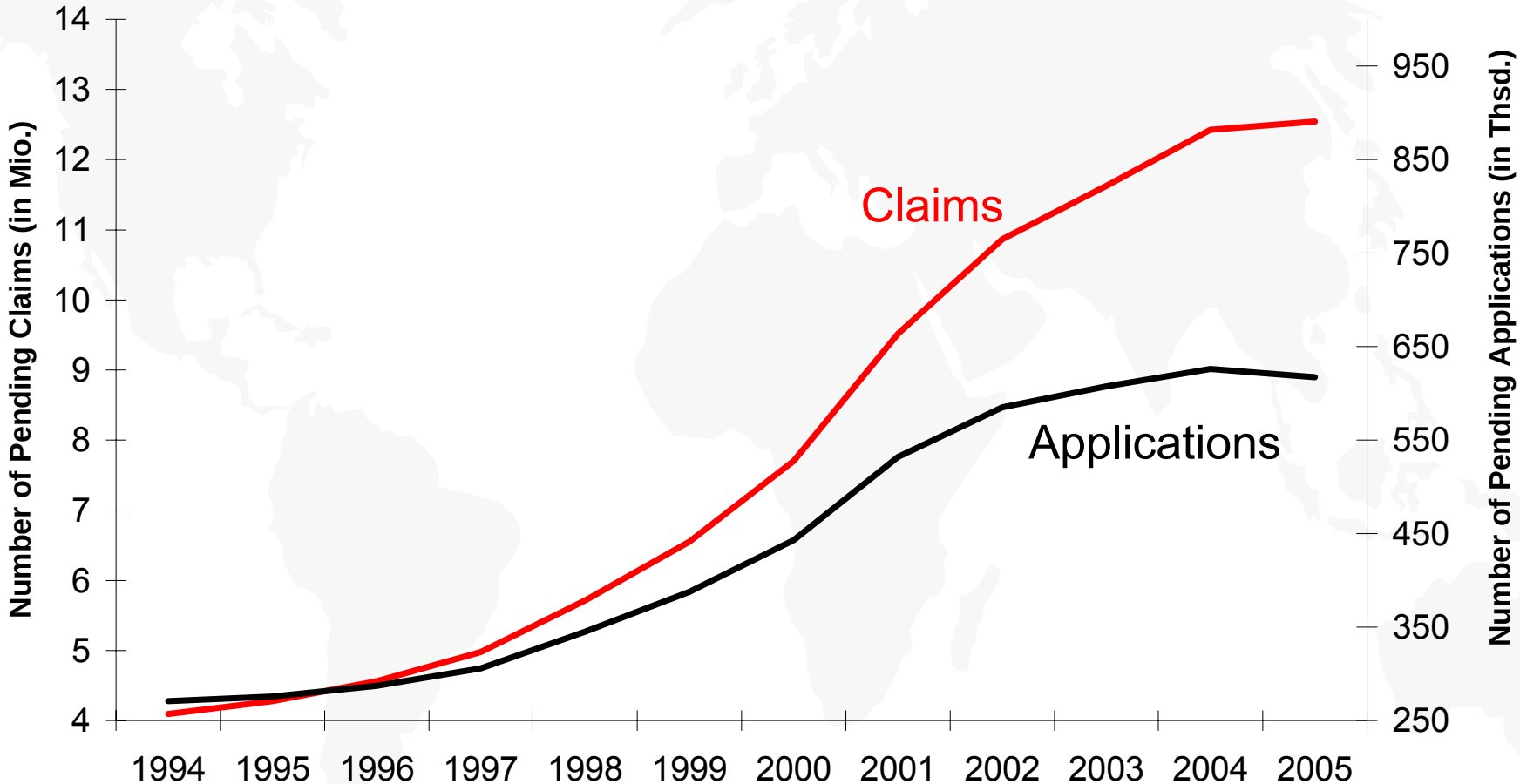


*by year of application

Avg. number of claims per application and Joint Cluster at EPO, 1995 vs. 2004



Pending applications and claims



Voluminosity: Why it is a problem

Higher number of claims mean usually less disclosure (the real invention is hidden "somewhere"), excessively broad rights and higher cost of processing for the patent office.

=> need to be reduced (strict enforcement of rules, claim fees etc.)

Fostering markets for technology

- Markets for technology are essentially good for the economy
- Markets for technology (notably licensing) do have certain failures due to imperfect information, transaction costs, inadequate regulation

=> A policy agenda needs to be set up.

Markets for technology

Current work at OECD, with METI involved (intangibles); Co-operation with EPO

=> policies should be cautiously designed and implemented (avoiding interference):

e.g. Accounting framework for patents and licenses, granting high quality patents, fostering the diffusion of information on supply and demand for particular technologies (JPO), templates for licensing contracts etc.

European Patent Office

Thank you for your attention

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