

# The Quality Factor in Patent Systems

Intellectual Capital for Communities in the Knowledge Economy  
Nations, Regions, Cities and Emerging Communities, IC6  
Paris, The World Bank

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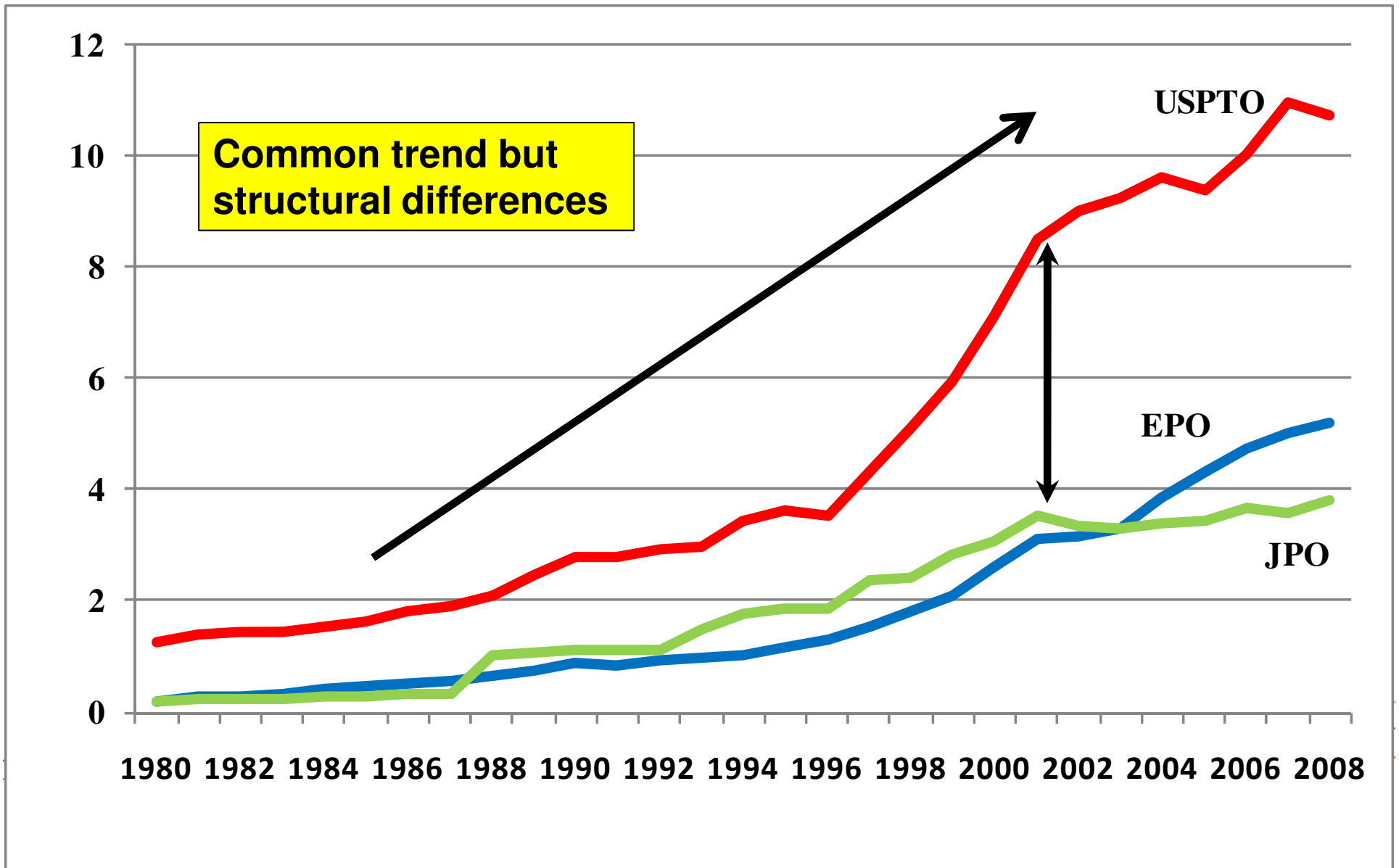
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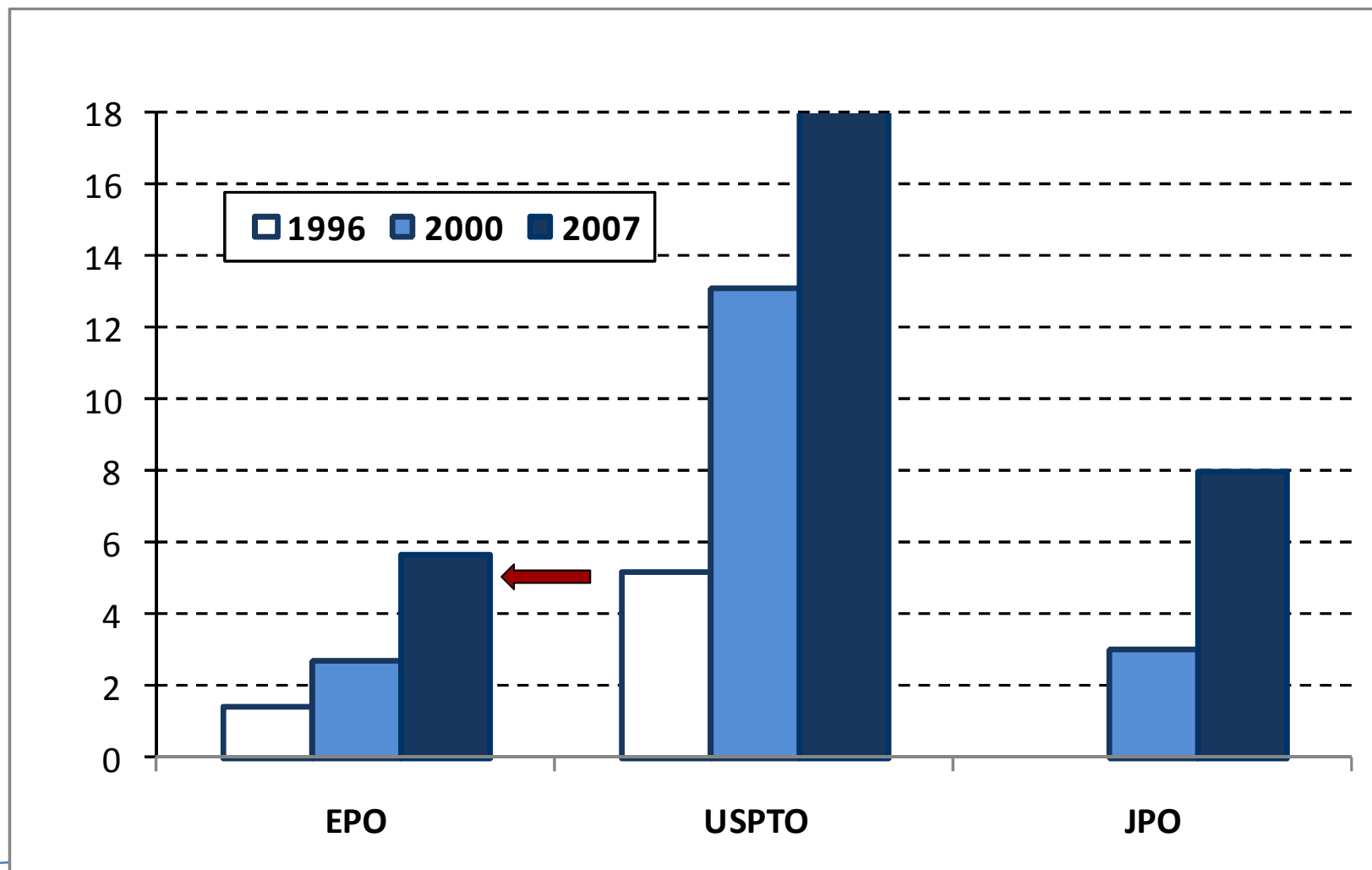
# Global patent warming?

Number of claims filed at 3 patent offices, (M), 1980-2008



# Global patent warming?

Number of claims in pendency (M)



**Common trend but structural differences**

## Global patent warming?

- **Common trend across patent systems is explained by:**
  - Globalization of markets,
  - Harmonization of patent systems (PCT,...)
  - New and dynamic countries in the arena (BRICS)
  - New technologies (Bio, nano...)
  - New actors (SMEs, universities)
  - New management of R&D: open innovation
  - New strategies (portfolio, thickets, flooding, marketing, FTO ...)

See Guellec and van Pottelsberghe (2007)

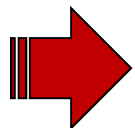
## Backlogs?

USA: yes definitely, and worrying!

JPO: less an issue (compared to the US)

EPO: much less an issue

But a clear upward trend...



**Search for the ultimate cause...**

## Jaffe and Lerner (2004) 's hypothesis:

- hypothesis of a vicious cycle for the US system: Low quality examination lead to more filings of lower quality, which in turn reduces the examination quality through overloaded examiners...
- Can “quality” explain structural differences ?
- Heterogeneous rigor (quality) could be due to different design, hence to policy makers at large (lawyers, PO, policy makers...)
- **The objective of this paper is to develop a new methodological framework to assess quality in patent systems**

## Paper aims to bridge two gaps

- **Economic literature on patent systems has not tackled quality under a systemic approach (“output rates” are biased indicators)**
- **Reduce the distance between “patent experts world” on the one hand and policy makers, economists and entrepreneurs on the other hand**
  - **Examiner manual: 600 pages (art 137b, rule 35...): too complex**
  - **Theoretical approach: breadth or scope - little “practical” policy implication**
    - Gilbert and Shapiro (1990) : “breadth” = ability to raise price
    - Klemperer (1990) : “breadth” = a larger region of the product space

**Balance between high complexity and abstract simplification**

## Paper structure:

- ➔ • **Economic literature on patent systems**
- **A 2-layer analytical framework**
- **International comparison (3 offices)**
- **Concluding remarks and policy implications**



## A gap in the literature?

When « stronger » means « weaker »

- Economists implicitly or explicitly consider patent '**strength**' as
  - Larger geographical scope
  - Improved enforcement mechanism (whatever the quality of patent)
  - New patentable subject matters
  - Number of patents
  - The “**Ginarte and Park (1997) index**”, and **Lerner (2002)**' index are actually “**applicant-friendliness**” indices, mainly composed of subject matters, longer duration, favourable enforcement mechanisms, and **no insight** on **selection mechanisms**

## A gap in the literature?

### On the importance of filtering : theoretical insights

- **O'Donogue (1998)**: more stringent selection criterion would provide longer incumbency and hence higher innovation incentives;
- **Dewatripont and Legros (2008)** show that litigation threats contribute to reduce the propensity to file low quality applications, but hinders the production of strong patents. One solution to reduce this negative side effect would be to sharpen the filtering process;
- **Farrell and Shapiro (2008)** also underline the importance of filtering, as determining patent validity prior to licensing is socially beneficial.
- **Filtering? (Grant rates are biased indicators: CIP, loads, pendency)**

## A gap in the literature?

Definition gap: theoretical concept vs implementation

Authors tend to focus on a specific dimension of a multifaceted selection process.

- **Scotchmer and Green (1990)** : novelty requirement and ownership rules (“first-to-file” vs “first-to-invent”)
- **Yamauchi and Nagaoka (2009)** : period allowed for requesting an examination at the Japan Patent office (JPO).
- **Franzoni and Scellato (2010)** : consequence of the grace period
- **De Rassenfosse and van Pottelsberghe (2008, 2009, 2010)**: fees
- **Cockburn et al. (2002)** : examiners’ characteristics ;
- **Friebel et al. (2006), Langinier and Marcoul (2009)** : organisational practices and incentive mechanisms
- **Lemley (2001)**: resources put in place to examine patents.
- **Graham and Harhoff (2006) , Graham et al. (2002)**: post-grant opposition process...

## Paper structure:

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**Quality is defined as the extent to which  
patent systems comply with  
their patentability conditions  
in a transparent way.**

## Two layers: Legal standards and their operational design

	Subject Matter	Novelty	Inventiveness	Fees
Metric?	yes	no	no	yes

## Two layers: Legal standards and their operational design

	Subject Matter	Novelty	Inventiveness	Fees
Metric?	yes	no	no	yes
OD1		Subject matter (2)	Novelty (3)	
OD2		Ownership (1)	Request Exam (2)	
OD3		Identification (2)	Definition (1)	
OD4		Search report (1)	Incentives (2)	
OD5		Languages (2)	Skills (3)	
OD6		Opposition (3)	Workload (3)	
OD7		Grace period (1)	Opposition (2)	
OD8		Control. Adapt (3)		
OD9		Hidden pat. (2)		

## Quality assessment

The components of each operational designs have various level of relevance: 2 weighting schemes:

- 1- Relevance on a 1 to 3 scale (depending on importance for filtering and on transparency)
- 2- Relevance computed from pair wise comparisons of all components of an operational design

The components interact with each other



## Paper structure:

- Economic literature on patent systems
- A 2-layer analytical framework
- ➔ • International comparison (3 offices)
- Concluding remarks and policy implications

Legal stand.

Subj. matter

Novelty

Invent. step

Fees

	U. S.	Europe
• Substance	✓	✓
• Process	✓	✓
• Use	✓	✓
• Method of doing business	✓	X
• Software (algorithm)	✓	X
• Theories	✓	X
Human genes	✓	X

The challenge is to identify the relevant state of the art

## Evaluation of the novelty condition

Patent  
cond.

Subj.  
matter

Novelty

Invent.  
step

Fees

Novelty	USPTO	JPO	EPO
Subject matter (2, 3)	1	2	2
Ownership (1, 2)	1	2	2
Identification (2, 3)	2	2	3
Search report (1, 2)			
Languages (2, 5)			
Opposition (3, 7)			
Grace period (1, 0)			
Control. Adapt (3, 8)			
Hidden pat. (2, 6)			

## Identification of “relevant” prior art:

- **EPO = Examiner**
  - **JPO= outsourced to retired examiners (up to date?) and private sector; to other countries?**
  - **USPTO= duty of applicant; outsourcing?**
- 
- **USPTO: risk of loads of references**

## Evaluation of the novelty condition

Patent  
cond.

Subj.  
matter

Novelty

Invent.  
step

Fees

Novelty	USPTO	JPO	EPO
Subject matter (2, 3)	1	2	2
Ownership (1, 2)	1	2	2
Identification (2, 3)	2	2	3
Search report (1, 2)	1	1	2
Languages (2, 5)	1	1	3
Opposition (3, 7)			
Grace period (1, 0)			
Control. Adapt (3, 8)			
Hidden pat. (2, 6)			

## Evaluation of the novelty condition

Patent  
cond.

Subj.  
matter

Novelty

Invent.  
step

Fees

Novelty	USPTO	JPO	EPO
Subject matter (2, 3)	1	2	2
Ownership (1, 2)	1	2	2
Identification (2, 3)	2	2	3
Search report (1, 2)	1	1	2
Languages (2, 5)	1	1	3
Opposition (3, 7)	1	1	3
Grace period (1, 0)	1	2	3
Control. Adapt (3, 8)	1	3	3
Hidden pat. (2, 6)			

Much “softer” novelty condition in the US...

Patent  
cond.

Subj.  
matter

Novelty

Invent.  
step

Fees

Novelty		USPTO	JPO	EPO
Subject matter (2, 3)		1	2	2
Ownership (1, 2)		1	2	2
Identification (2, 3)		2	2	3
Search report (1, 2)		1	1	2
Languages (2, 5)		1	1	3
Opposition (3, 7)		1	1	3
Grace period (1, 0)		1	2	3
Control. Adapt (3, 8)		1	3	3
Hidden pat. (2, 6)		1	3	3
Weighted sum W1-3		100	174	247
USA=100	WB	100	185	259

Patent  
cond.

Subj.  
matter

Novelty

Invent.  
step

Fees

**A timely and high-quality  
search report is central  
to the quality of the  
substantive examination**



## Evaluation of the inventiveness condition

Patent  
cond.

Subj.  
matter

Novelty

Invent.  
step

Fees

Inventive step	USPTO	JPO	EPO
<b>Novelty</b> (3, 4)	1	2	3
<b>Request Exam</b> (2, 2)	2	2	3
<b>Definition</b> (1, 0)	1	1	2
<b>Incentives</b> (2, 3)	1 LW, LSR	2 MW, HSR	2 HW, MSR

## Evaluation of the inventiveness condition

Patent  
cond.

Subj.  
matter

Novelty

Invent.  
step

Fees

Inventive step	USPTO	JPO	EPO
<b>Novelty (3, 4)</b>	1	2	3
<b>Request Exam (2, 2)</b>	2	2	3
<b>Definition (1, 0)</b>	1	1	2
<b>Incentives (2, 3)</b>	1	2	2
<b>Skills (3, 6)</b>	1 33% TO	3 0%	3 3% D3-check

## Evaluation of the inventiveness condition

Patent  
cond.

Subj.  
matter

Novelty

Invent.  
step

Fees

Inventive step	USPTO	JPO	EPO
Novelty (3, 4)	1	2	3
Request Exam (2, 2)	2	2	3
Definition (1, 0)	1	1	2
Incentives (2, 3)	1	2	2
Skills (3, 6)	1	3	3
Workload (3, 4)			

## Workload indicators, 2008

Patent  
cond.

Subj.  
matter

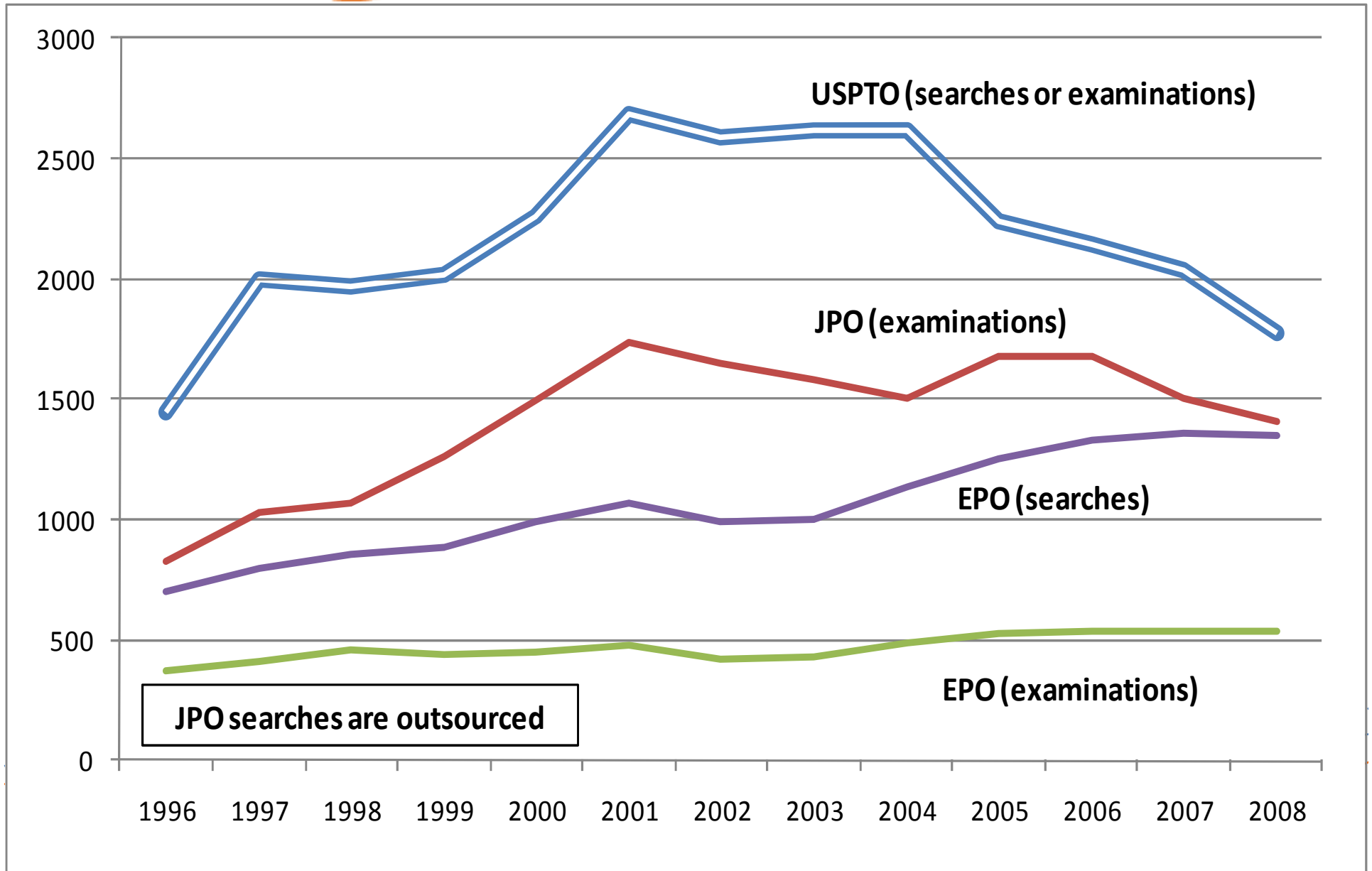
Novelty

Invent.  
step

Fees

Inventive step	USPTO	EPO	JPO
Workload: App/exam	72	38	(75)
Grant/examiner	29	15	
claims per examiners	1722	535	1500

## Evolution of the number of claims 'in search' or 'in examination' per examiner



## Less rigorous inventiveness condition in the US...

Patent  
cond.

Subj.  
matter

Novelty

Invent.  
step

Fees

Inventive step		USPTO	JPO	EPO
Novelty	(3, 4)	1	2	3
Request Exam	(2, 2)	2	2	3
Definition	(1, 0)	1	1	2
Incentives	(2, 3)	1	2	2
Skills	(3, 6)	1	3	3
Workload	(3, 4)	1	2	3
Opposition	(2, 2)	1	1	3
Weighted sum	W1-3	100	178	250
USA=100	WB	100	200	261

Patent  
cond.

Subj.  
matter

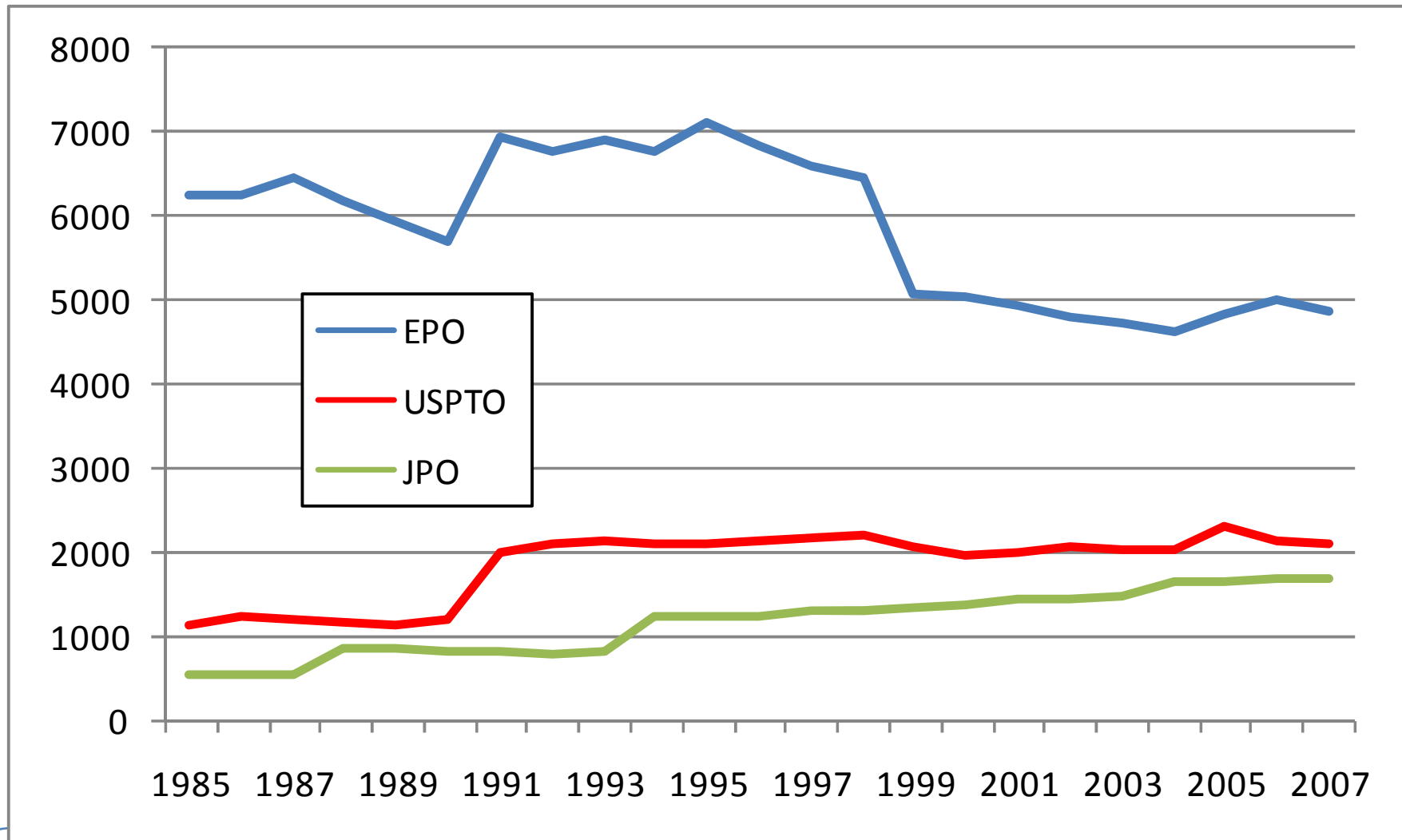
Novelty

Invent.  
step

Fees

**A high-quality  
examination must be  
'funded' vs 'affordability'  
for inventors**

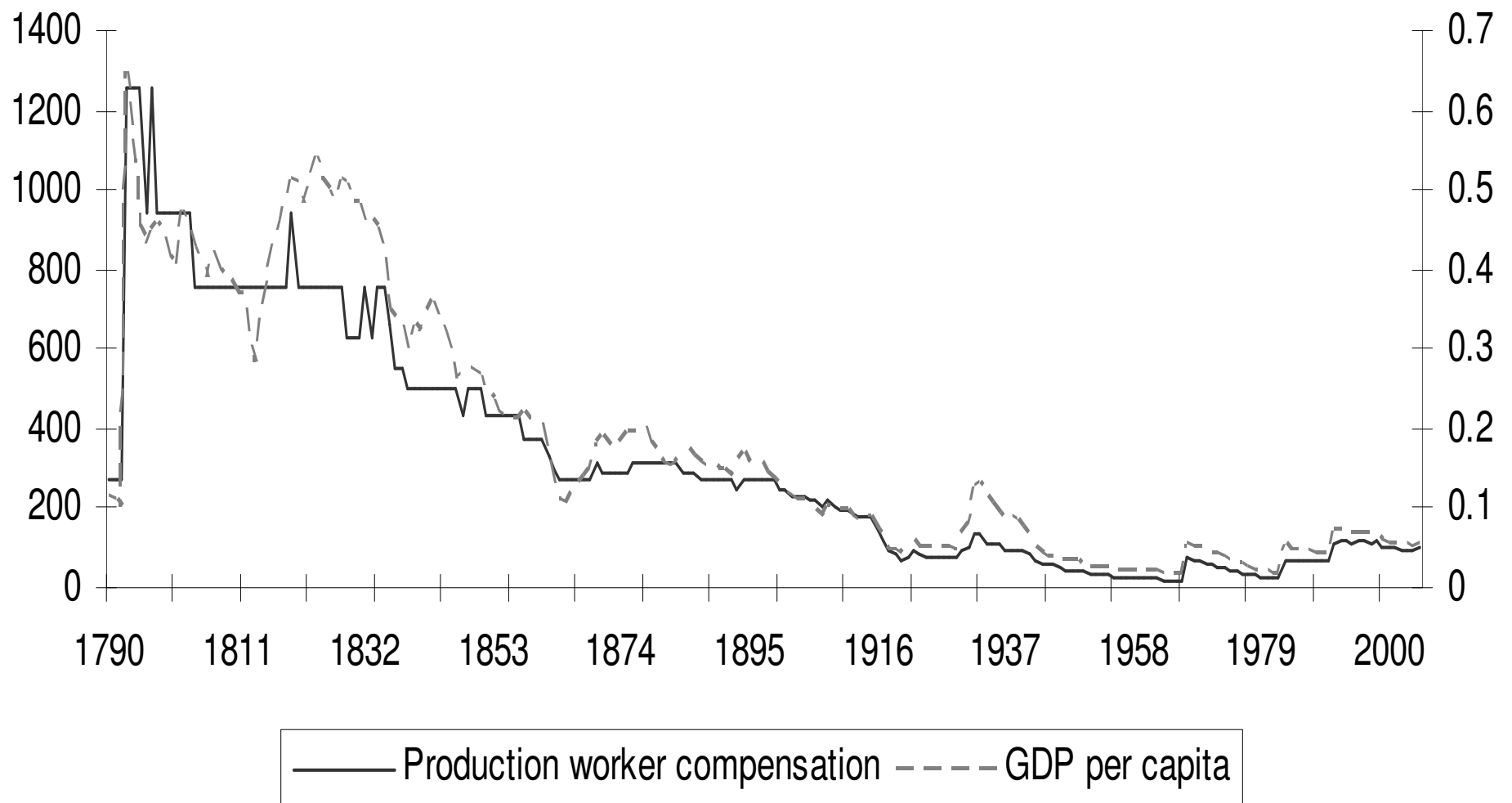
## Evolution of fees 'up to grant'





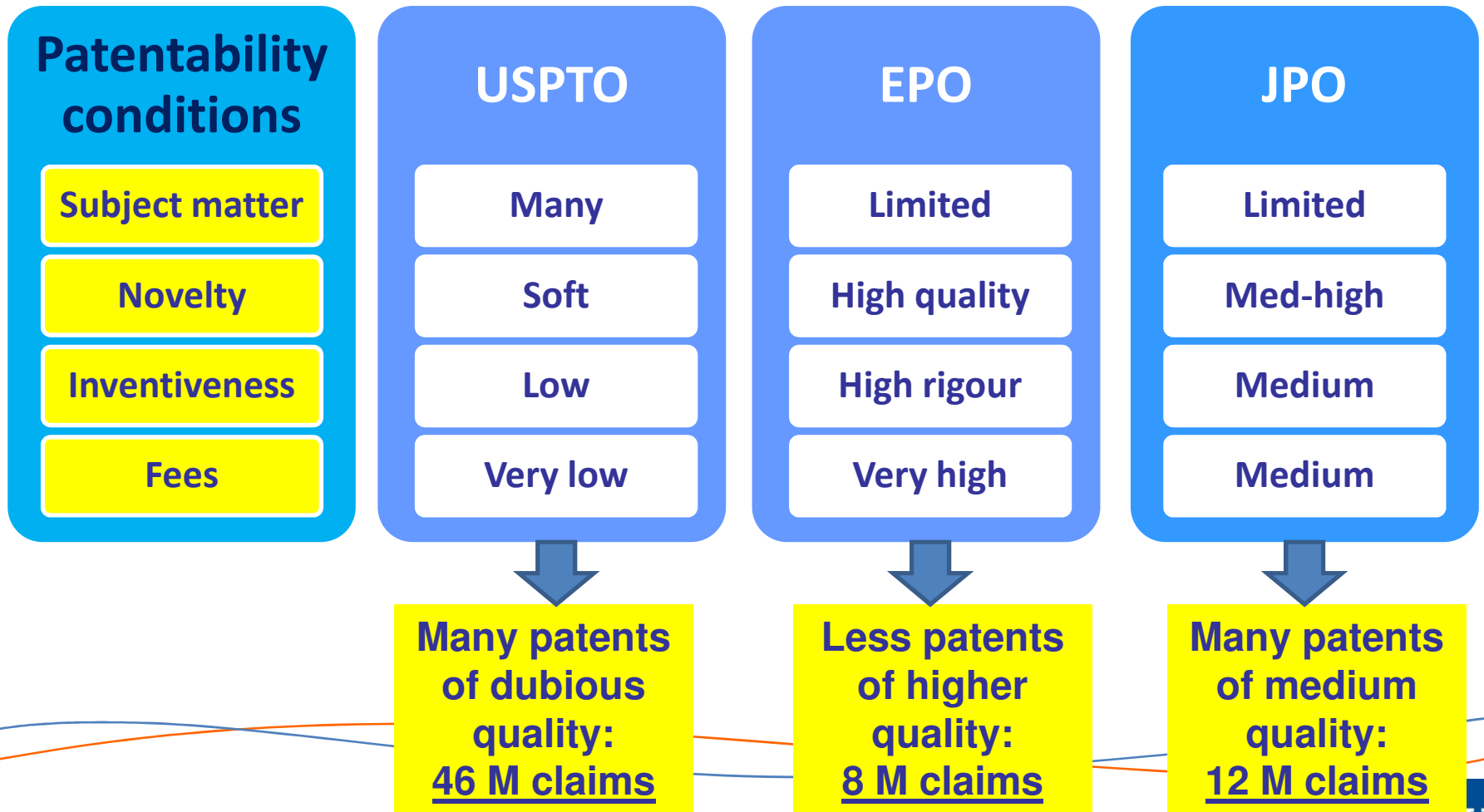
## Evolution of application fees at the USPTO, 1790-2005, affordability concept: fees per wage

Source: de Rassenfosse and van Pottelsberghe, 2010

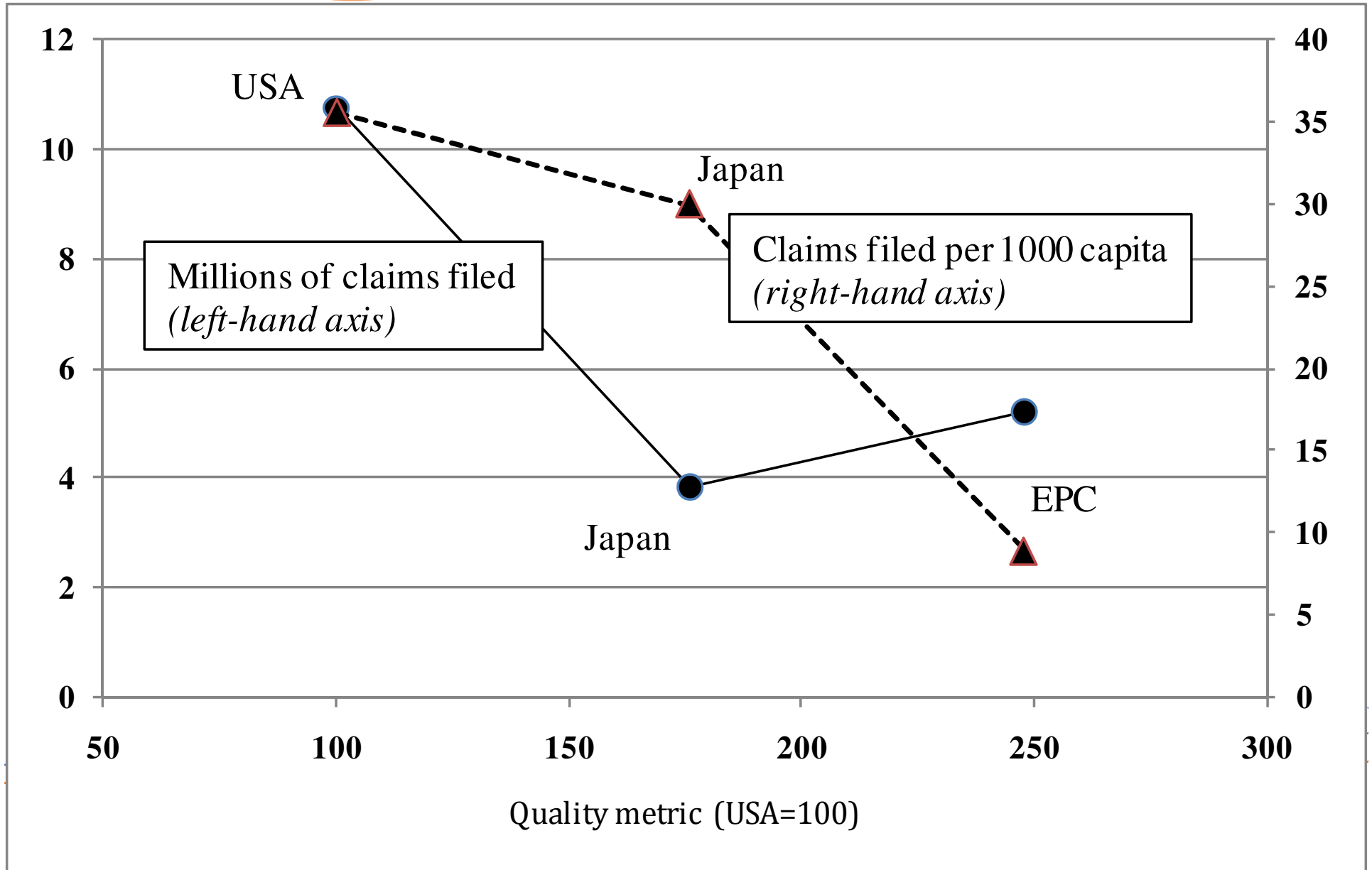


# What is a patent?

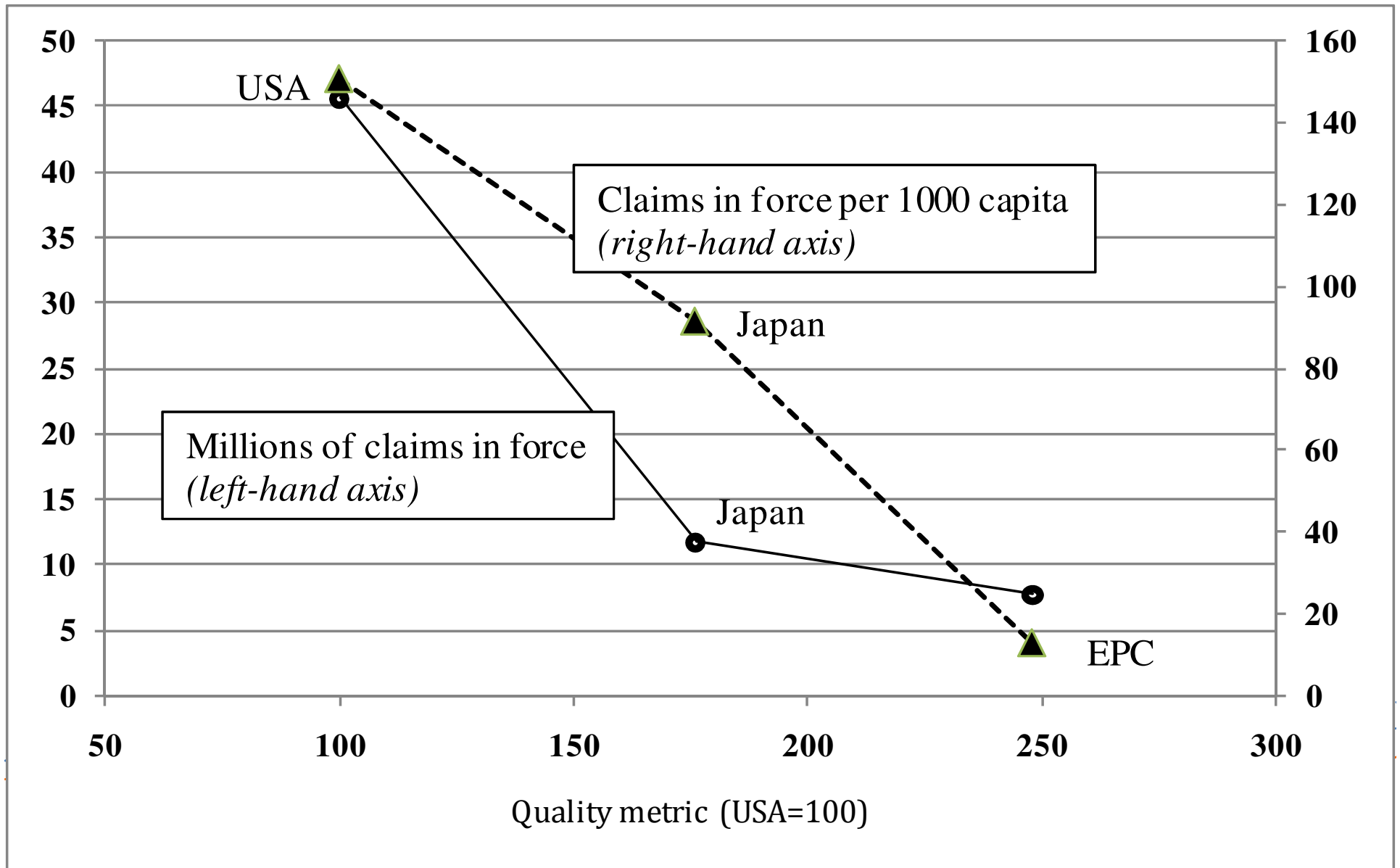
A patent gives its owner the right to **prevent** others from commercially using his invention for 20 years in exchange **for disclosing the invention**



## Quality level and the demand for patent rights, 2008



## Quality level and patent rights in force, 2008



## Blackberry : Why does quality matter?



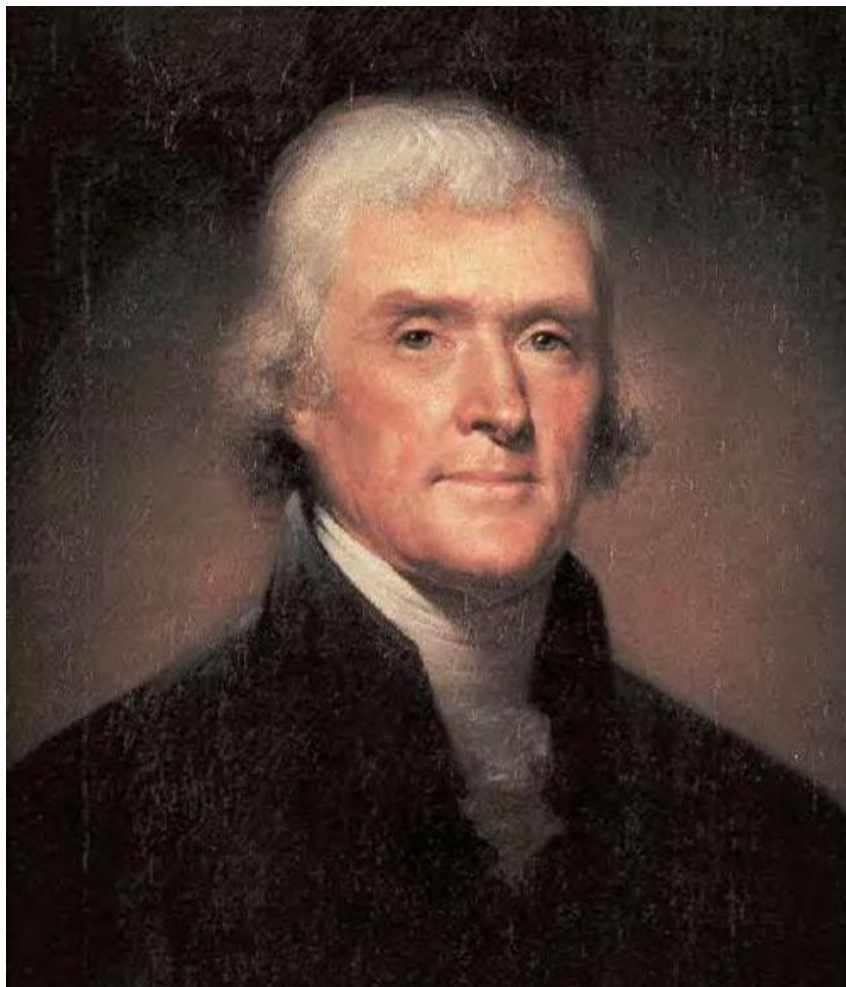
612 M USD for five  
patents that should not  
have been granted...



## Conclusions

- **Systemic approach must be adopted: many interdependent facets form a coherent system; it is not “just” about F2F, Opposition,...**
- **EPO provides a higher quality service than the USPTO, JPO is in an intermediate position.**
- **The quality metrics helps explaining structural differences (number of applications, or claims in force)**
- **Systemic convergence should be achieved before global mutual recognition takes place, with painful questions (incentives, ...)**

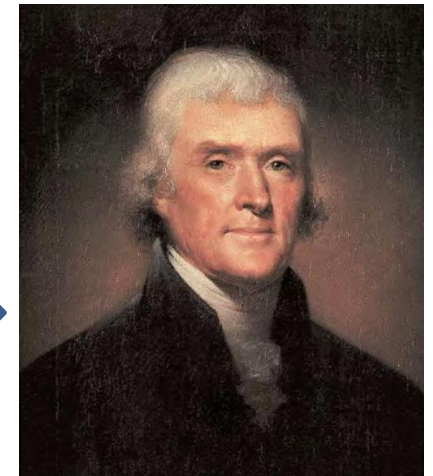
## Thomas Jefferson, 1794



**‘Patents should draw a line between the things which are worth to the public the embarrassment of an exclusive patent, and those which are not.**

**Patents are, after all, government-enforced monopolies and so there should be some ‘embarrassment’ (and hesitation) in granting them.**

# Relative position, but no insight into optimal level





## References: (cfr. also RePEc website)

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