

The Quality Factor in Patent Systems

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Reference:
van Pottelsberghe, 2010, The quality factor in patent systems, Bruegel Working Paper, 2010/03.

Bruno VAN POTTELSBERGHE
Professor, ULB, SBS-EM
Senior Fellow, Bruegel
bruno.vanpottelsberghe@ulb.ac.be

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Consequences of global patent warming...

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graph LR; A[Increased propensity to patent] --> B[Workload]; B --> C[Backlogs]; C --> D[Overloaded examiners]; D --> E[PPH, MRP]; E --> F[Uncertainty, longer pendency]; F --> A;
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• Increased propensity to patent

Workload

Backlogs

• Overloaded examiners

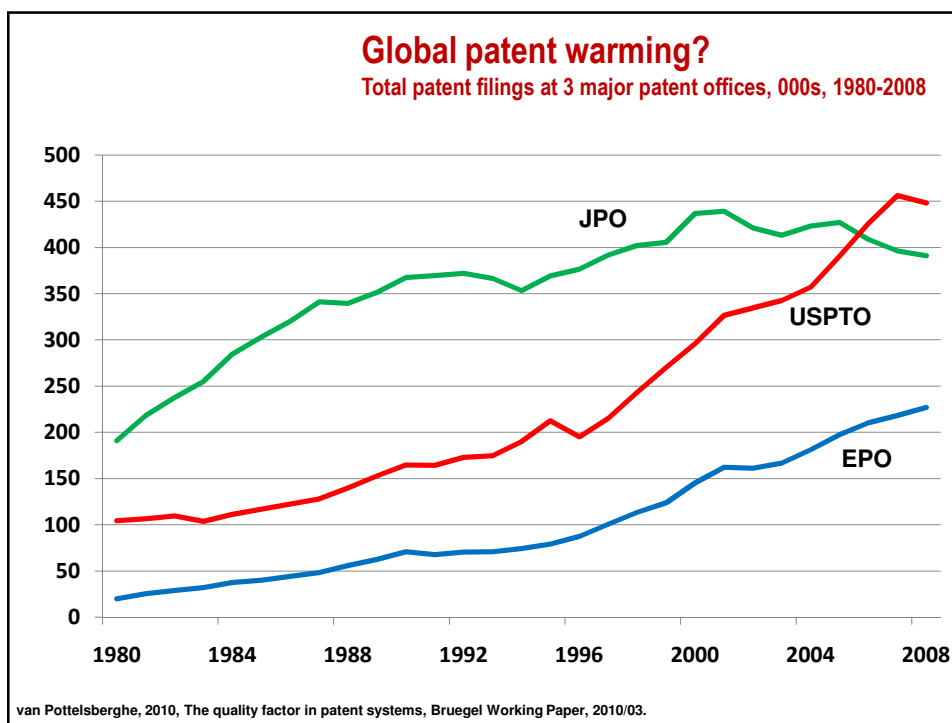
• Uncertainty, longer pendency

PPH, MRP

... But different causes/consequences across countries

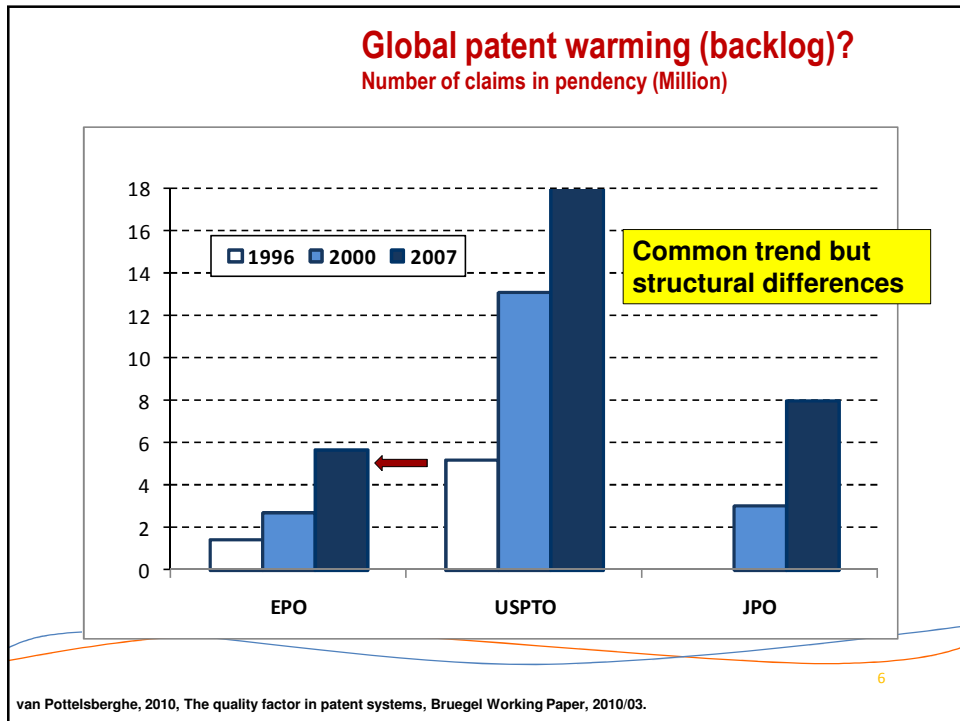
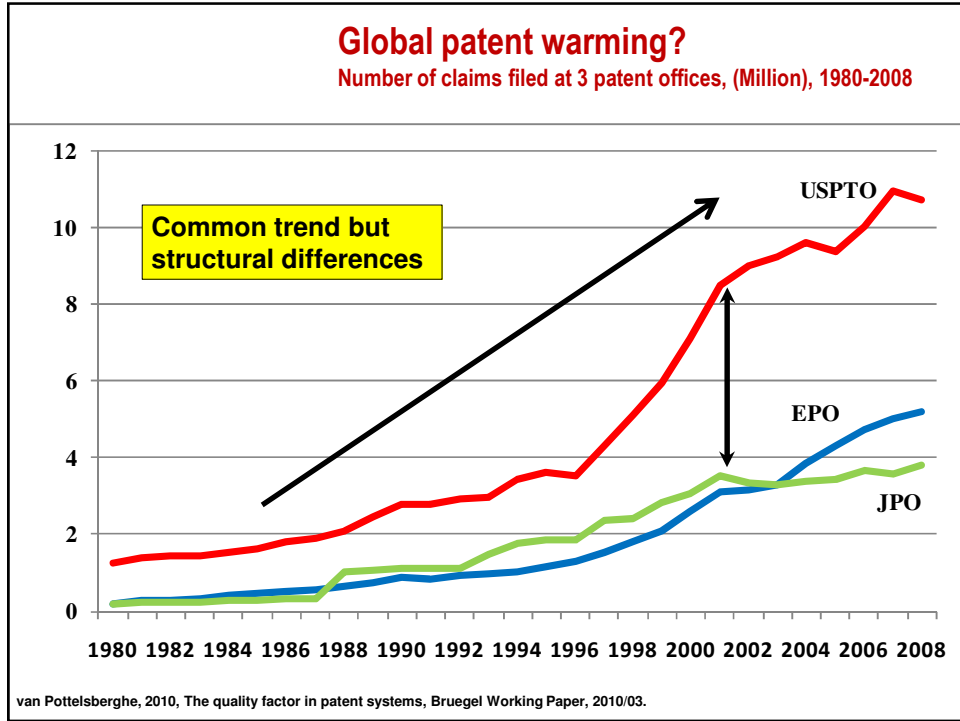
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National drafting practices at EPO: cf. Archontopoulos et al. (2007)

Priority Country	% of Top 1000 filings in # of claims	% of Top 1000 filings in # of pages
Denmark	0,3%	0,6%
France	0,1%	1,2%
Germany	0,6%	1,2%
Italy	0,2%	0,0%
Netherlands	0,1%	0,0%
Spain	0,2%	0,0%
Sweden	0,1%	0,0%
Switzerland	0,0%	0,2%
Continental Europe	1,6%	3,2%
United Kingdom	1,3%	3,4%
EPO	0,2%	0,5%
Total Europe	3,1%	7,1%
Canada	0,2%	0,2%
USA	82,0%	80,5%
North America	82,2%	80,7%
Japan	4,4%	8,7%
Other	10,3%	3,5%
Total	100,0%	100,0%



The common trend 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)

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Structural differences (Backlogs, workload)?

USA: yes definitely, and worrying!
JPO: less an issue (compared to the US)
EPO: much less an issue

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

van Pottelsberghe, 2010, The quality factor in patent systems, Bruegel Working Paper, 2010/03.

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 , and test J&L hypothesis across countries**

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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

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Paper structure:

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

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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**

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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)**

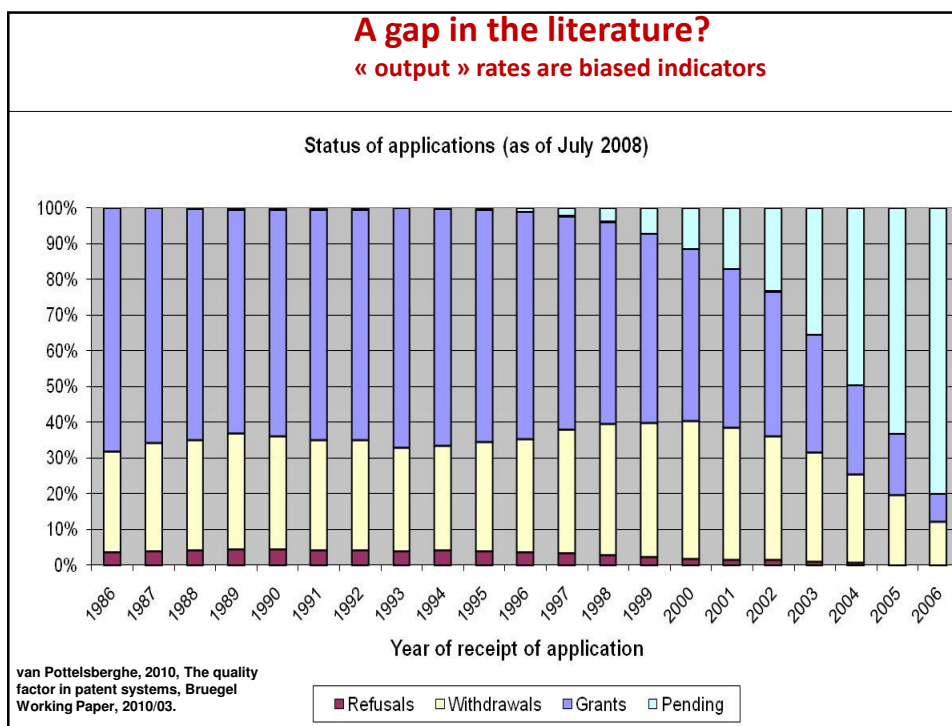
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A gap in the literature?

« grant » rates are biased indicators

- If several divisional or CIPs: one grant out of 10 CIP is officially a 10% grant rate but for the company it could be a 100%;
- Filing multiple patent applications with similar content : idem;
- Official data is biased (Grant/(grant+withdrawals+refusal)), especially in periods of high growth rates of patent applications;
- Need a cohort approach, but long delays (a 10 years pendency could be interpreted as « enforceable » patents)
- Similar source of bias for litigation (undisclosed settlements, etc)

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A gap in the literature?
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...

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

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Two layers: Legal standards and their operational design

	Subject Matter	Novelty	Inventiveness	Fees
Metric?	yes	no	no	yes

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Two layers: Legal standards and their operational design

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

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Relevance of OD's components

The components of each operational designs have various level of **relevance**. Two weighting schemes are used:

1- Relevance on a 1 to 3 scale (depending on **importance for filtering and for transparency**);

2- Relevance computed from **pair wise comparisons** of all components of an operational design...

Relevance levels for Novelty's OD => pair wise comparisons

	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9	SUM
OD2.1. Subject matters		1		1			1			3
OD2.2. Ownership (F2F vs F2I)				1			1			2
OD2.3. Identification of prior art	1	1					1			3
OD2.4. Search report			1				1			2
OD2.5. Language(s)	1	1	1	1			1			5
OD2.6. Opposition process	1	1	1	1	1		1		1	7
OD2.7. Grace period										0
OD2.8. Controlled adaptability	1	1	1	1	1		1	1	1	8
OD2.9. No hidden patents	1	1	1	1	1		1			6

Two layers: Legal standards and their operational design

	Novelty	W13	WB	Inventiveness	W13	WB
OD1	Subject matter	2	3	Novelty	3	4
OD2	Ownership	1	2	Request Exam	2	2
OD3	Identification	2	3	Definition	1	0
OD4	Search report	1	2	Incentives	2	3
OD5	Languages	2	5	Skills	3	6
OD6	Opposition	3	7	Workload	3	4
OD7	Grace period	1	0	Opposition	2	2
OD8	Control. Adapt	3	8			
OD9	Hidden pat.	2	6			
Cor			.91			.92

Bruno van Pottelsberghe, The quality factor in patent systems, May 2010

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Much more patentable subject matters in US

Legal stand.		U. S.	Europe Japan
Subj. matter	• Substance	✓	✓
	• Process	✓	✓
Novelty	• Use	✓	✓
	• Method of doing business	✓	✗
Invent. step	• Software (algorithm)	✓	✗
	• Theories	✓	✗
Fees	• Human genes	✓	✗

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Legal stand.		U. S.	Europe/Japan
	• Substance	✓	✓
	• Process	✓	✓
	• Use	✓	✓
Subj. matter	• Method of doing business	✓	✗
	• Software (algorithm)	✓	✗
	• Theories	✓	✗
Novelty	• Human genes	✓	✗
Invent. step			
Fees			

The challenge is to identify the relevant state of the art

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Evaluation of the novelty condition

Legal stand.	Novelty	USPTO	JPO	EPO
Subj. matter	Subject matter	1	2	2
Novelty	Ownership	1	2	2
Invent. step	Identification	2	2	3
Fees	Search report			
	Languages			
	Opposition			
	Grace period			
	Control. Adapt			
	Hidden pat.			

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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

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Evaluation of the novelty condition

Legal stand.	Novelty	USPTO	JPO	EPO
Subj. matter	Subject matter	1	2	2
	Ownership	1	2	2
	Identification	2	2	3
	Search report	1	1	2
	Languages	1	1	3
	Opposition			
	Grace period			
	Control. Adapt			
	Hidden pat.			

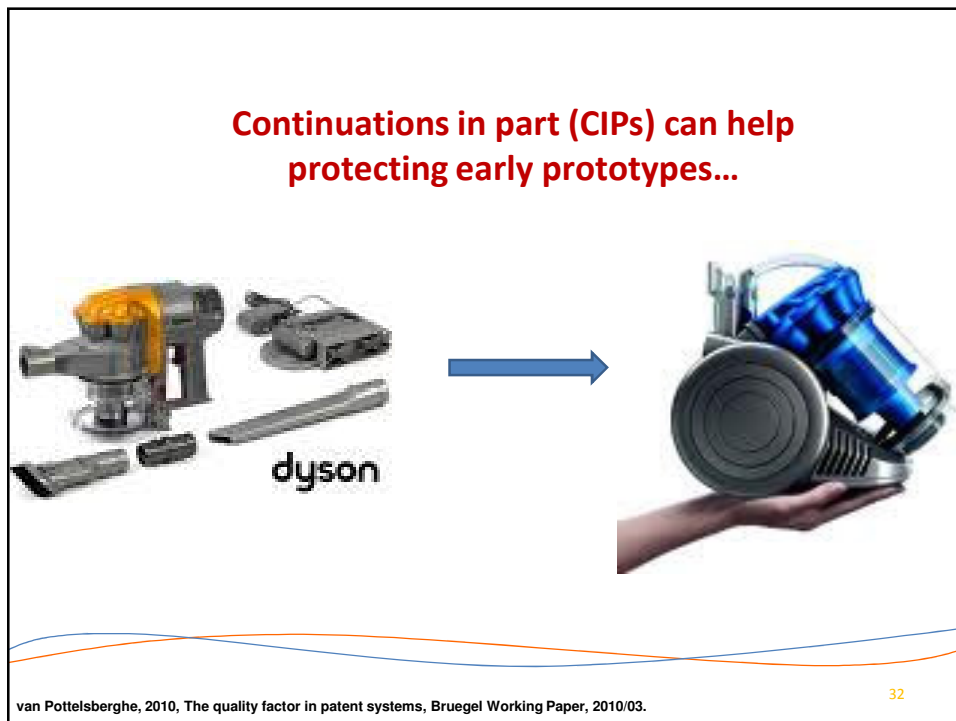
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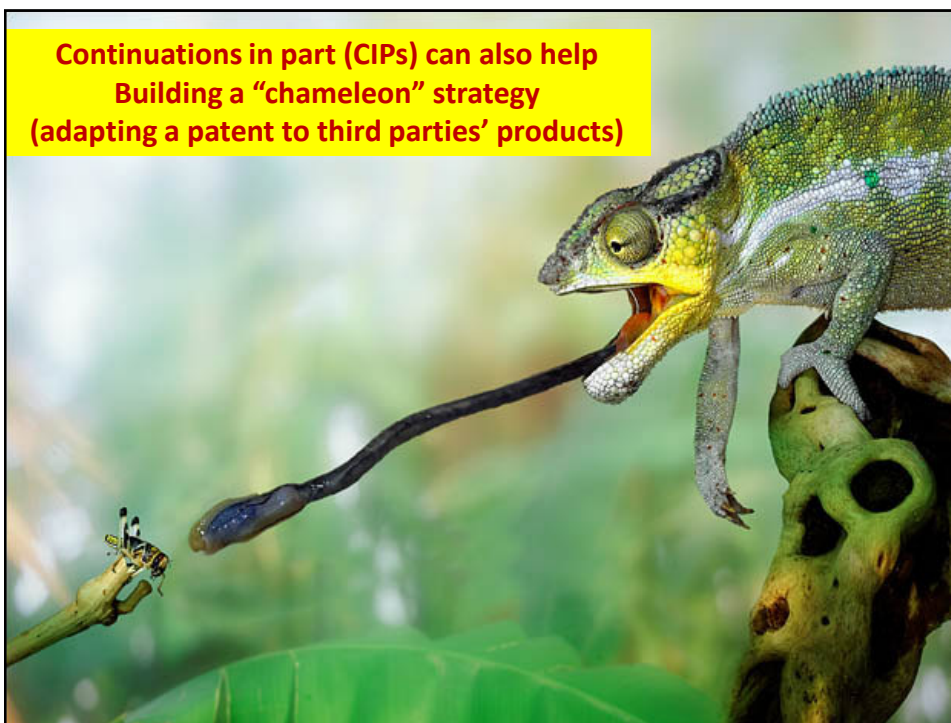
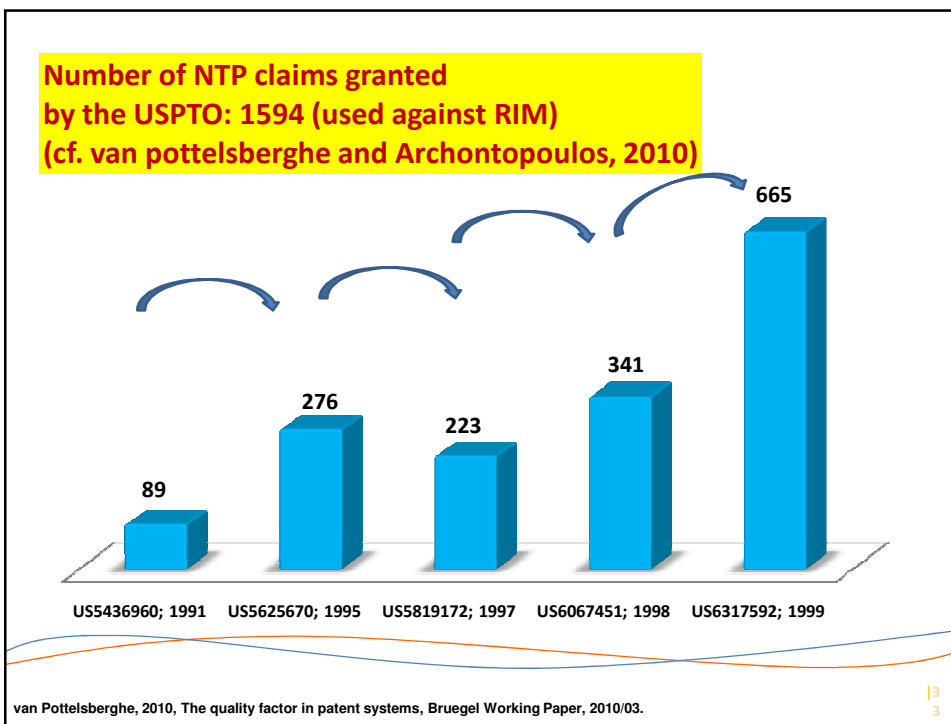


Evaluation of the novelty condition

Legal stand.	Novelty	USPTO	JPO	EPO
Subj. matter	Subject matter	1	2	2
Novelty	Ownership	1	2	2
	Identification	2	2	3
Invent. step	Search report	1	1	2
	Languages	1	1	3
Fees	Opposition	1	1	3
	Grace period	1	2	3
	Control. Adapt	1	3	3
	Hidden pat.			

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Much "softer" novelty condition in the US...

Legal stand.	Novelty	USPTO	JPO	EPO
Subj. matter	Subject matter	1	2	2
Novelty	Ownership	1	2	2
	Identification	2	2	3
Invent. step	Search report	1	1	2
	Languages	1	1	3
Fees	Opposition	1	1	3
	Grace period	1	2	3
	Control. Adapt	1	3	3
	Hidden pat.	1	3	3

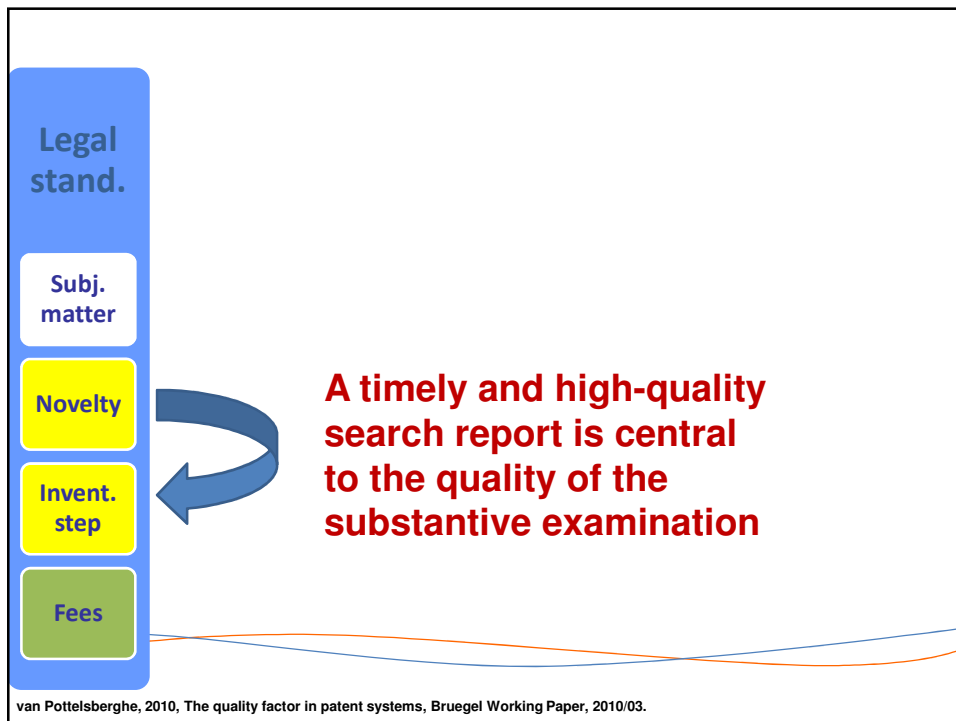
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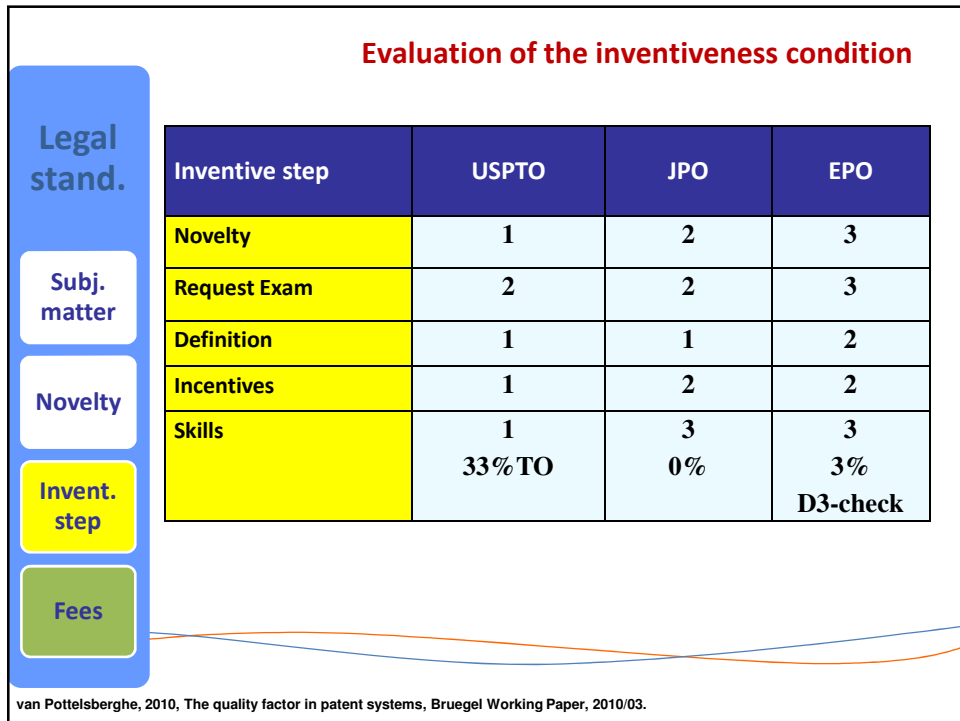
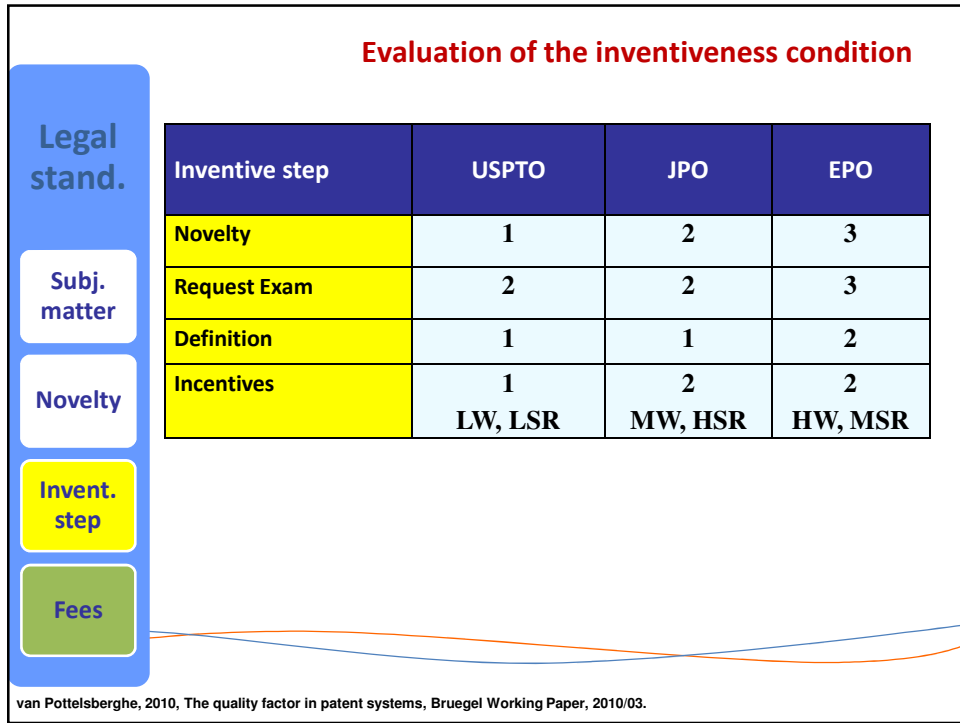


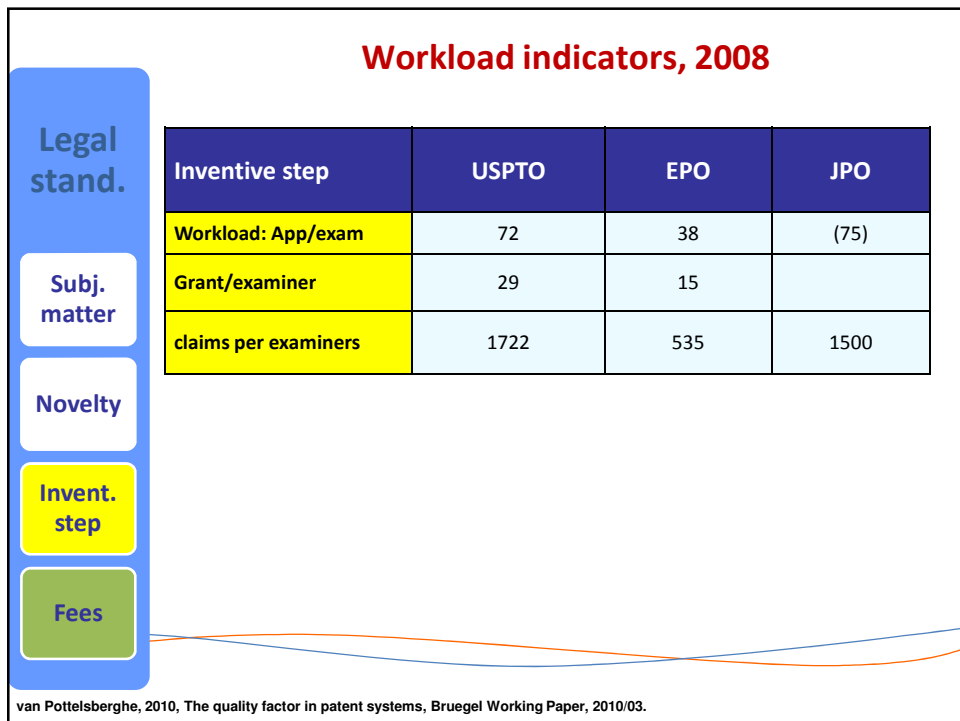
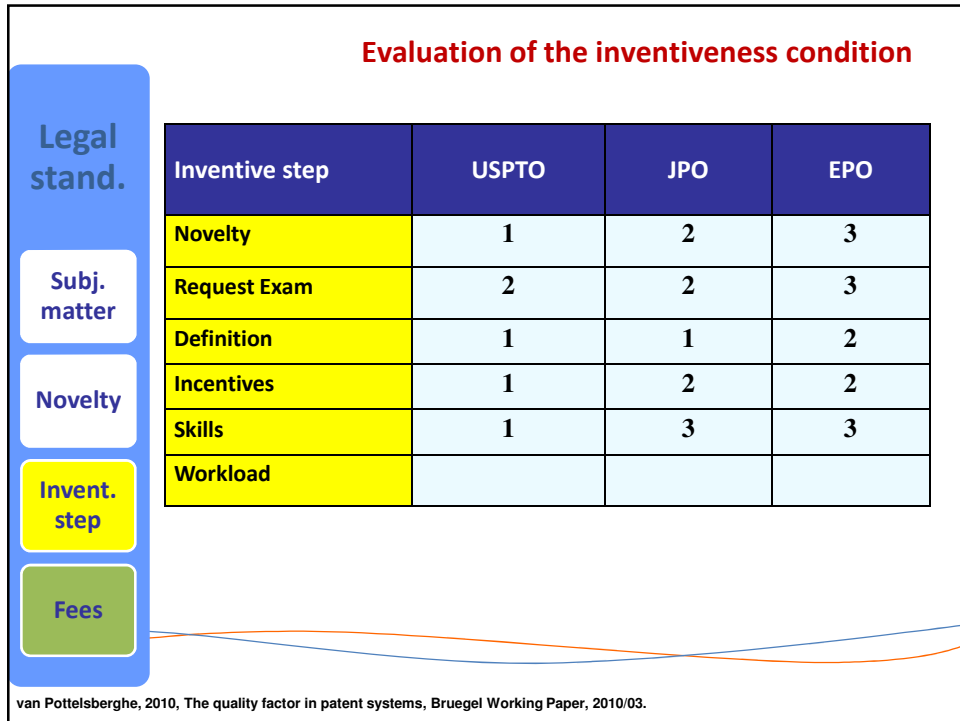
Much "softer" novelty condition in the US...

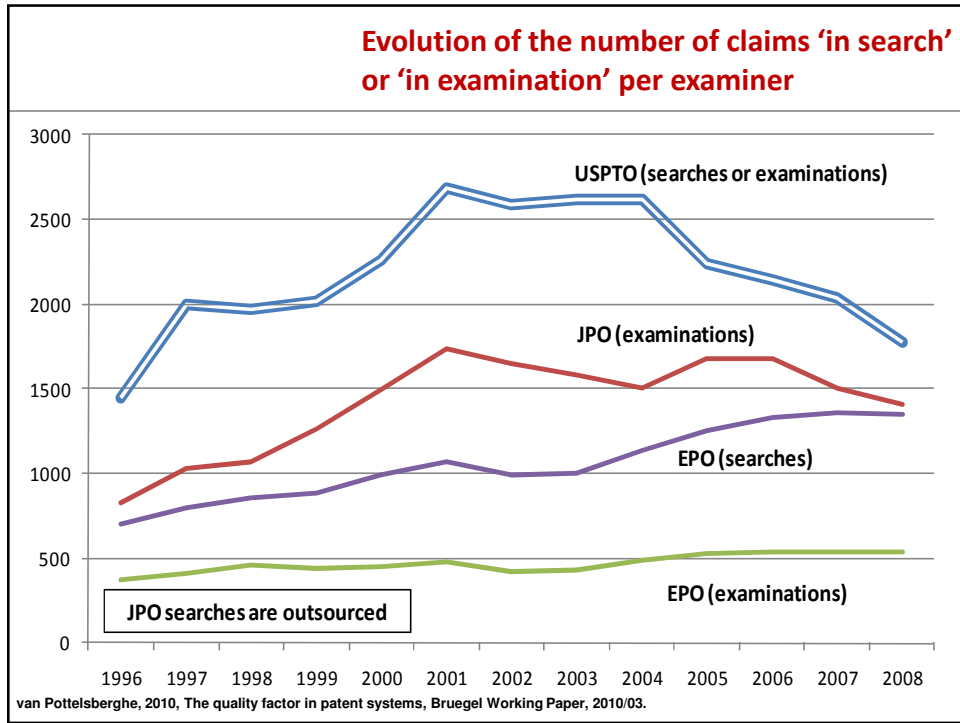
Legal stand.	Novelty	USPTO	JPO	EPO
Subj. matter	Subject matter	1	2	2
	Ownership	1	2	2
	Identification	2	2	3
	Search report	1	1	2
Novelty	Languages	1	1	3
	Opposition	1	1	3
Invent. step	Grace period	1	2	3
	Control. Adapt	1	3	3
Fees	Hidden pat.	1	3	3
	Weighted sum W1-3 USA=100 WB	100	174	247
		100	185	259

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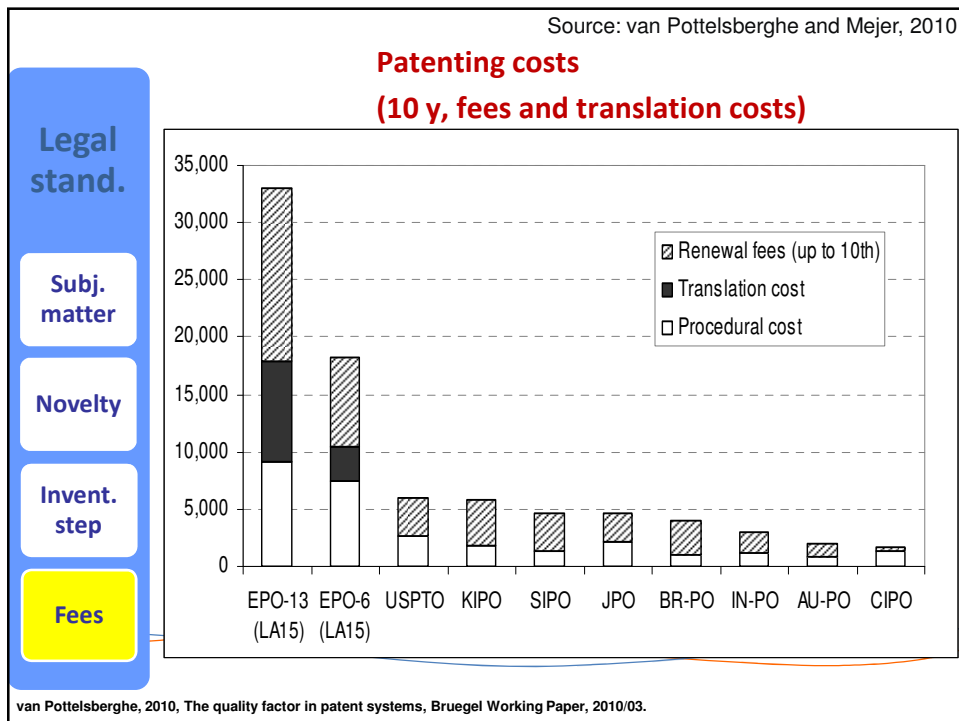
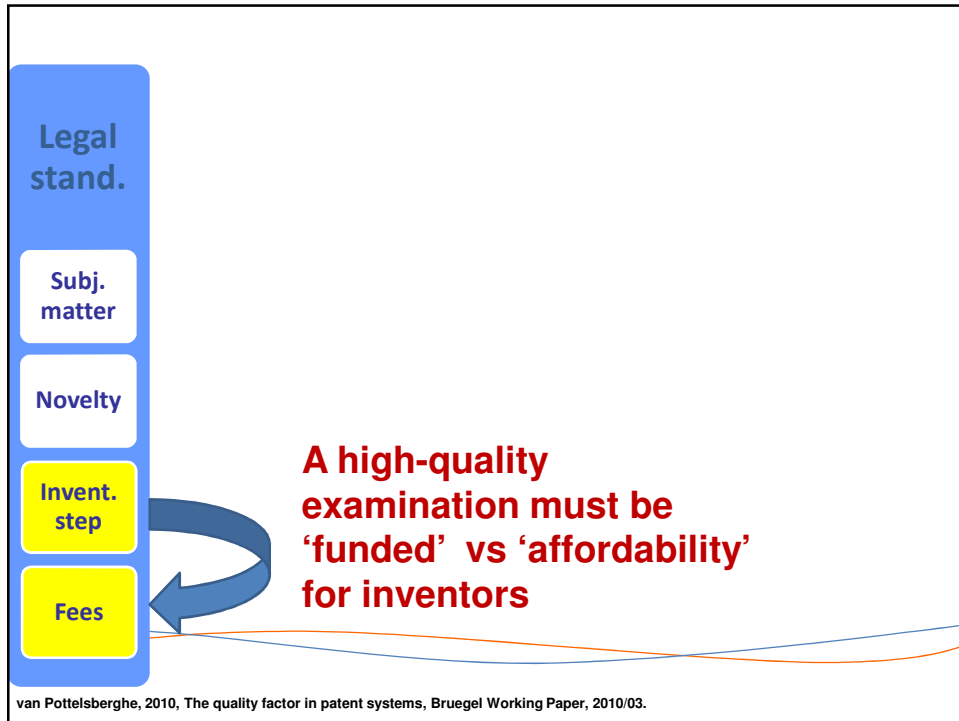


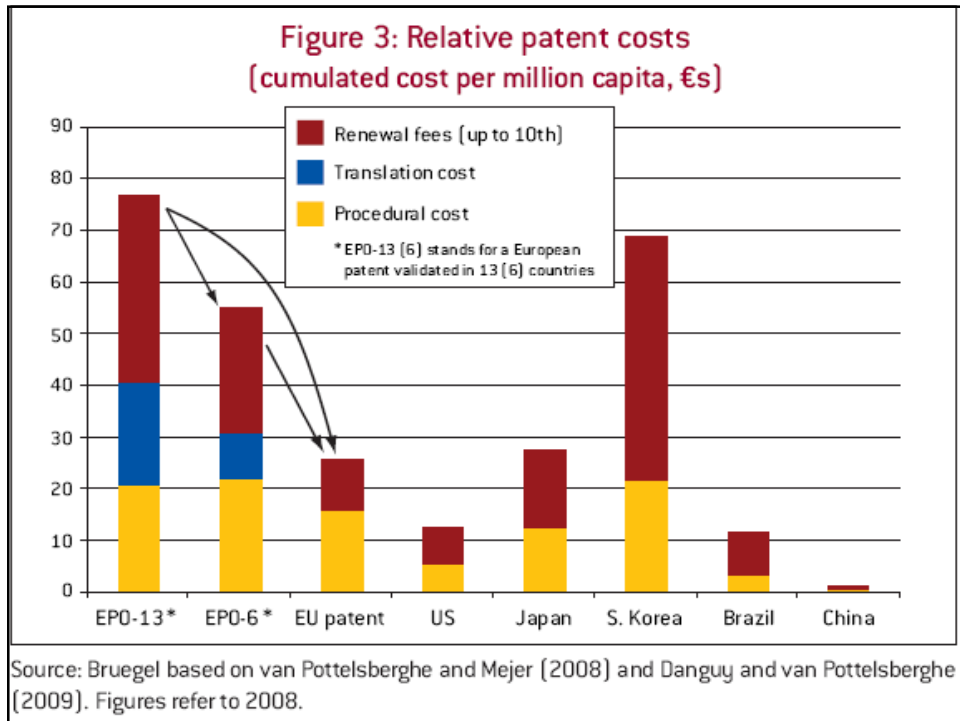
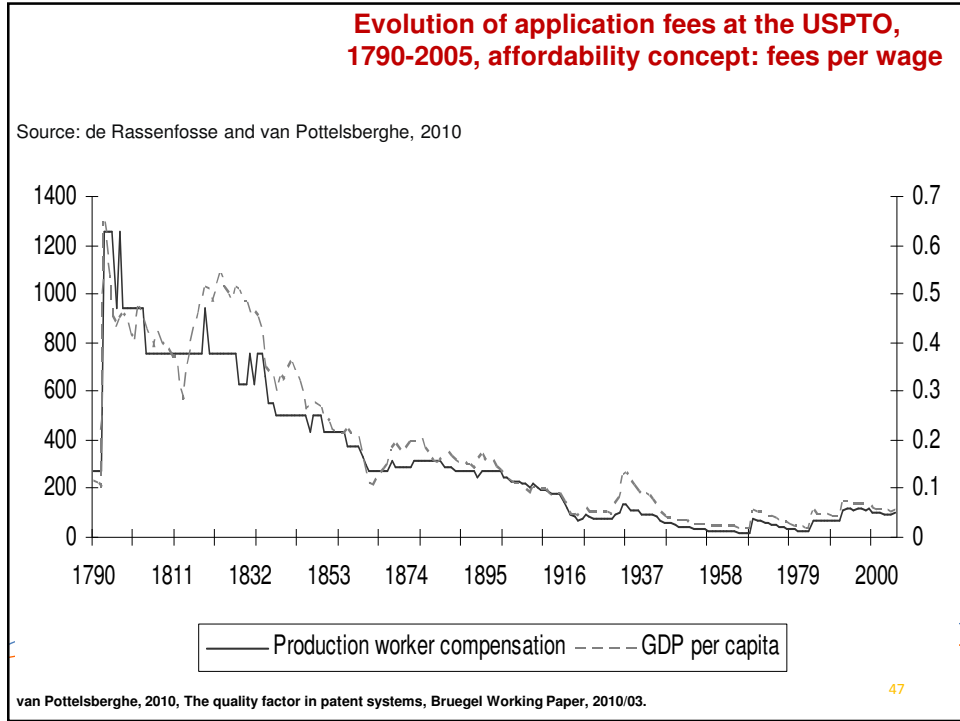


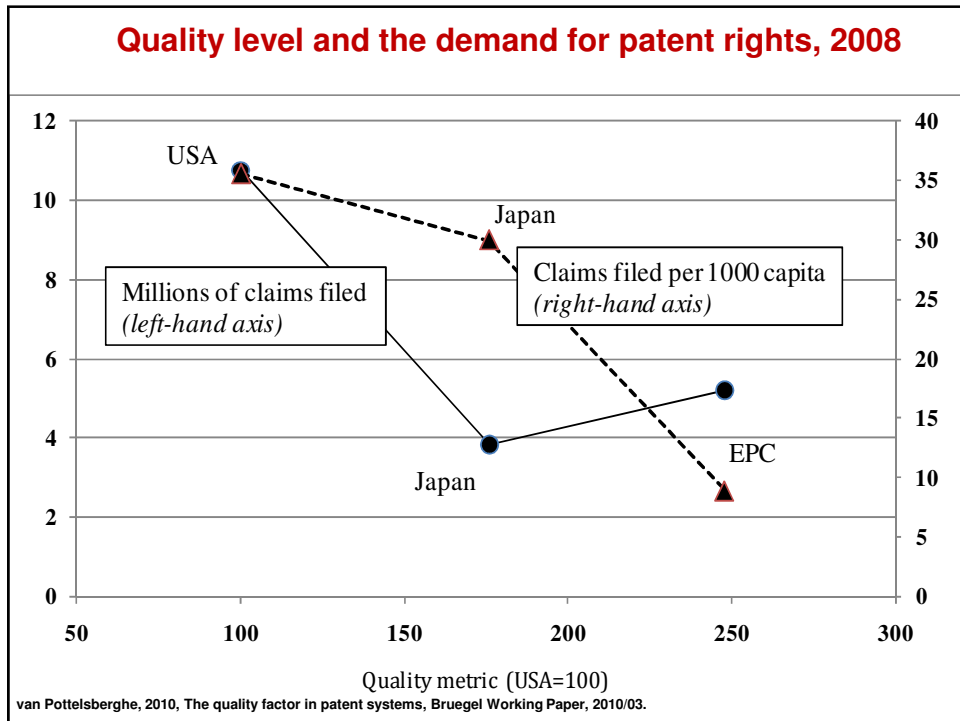
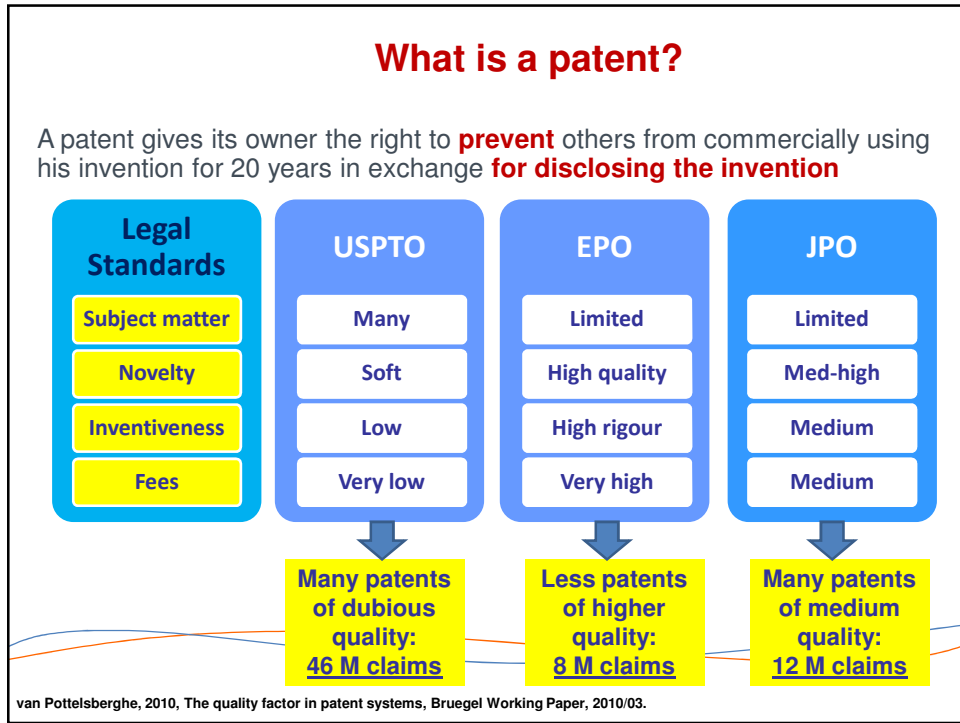
Less rigorous inventiveness condition in the US...

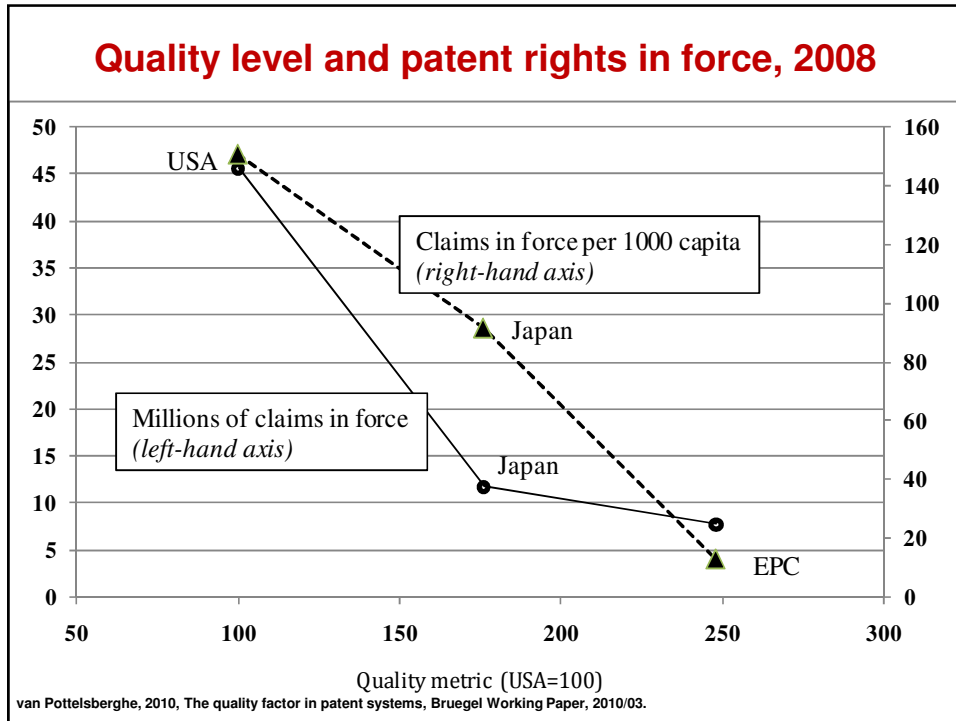
Legal stand.	Inventive step		USPTO	JPO	EPO
	Subj. matter	Novelty	Request Exam	1	2
Novelty	Definition	Incentives	1	1	2
	Skills	Workload	1	3	3
Invent. step	Opposition	Weighted sum	1	1	3
	USA=100	W1-3 WB	100	178	250
Fees			100	200	261

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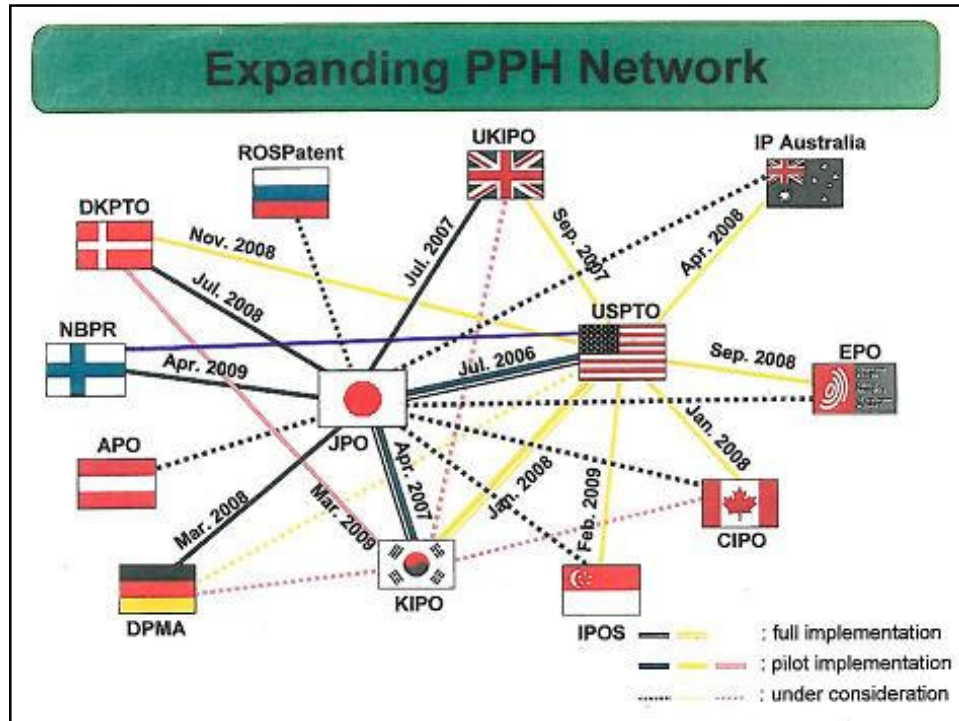
Blackberry : Why does quality matter?



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



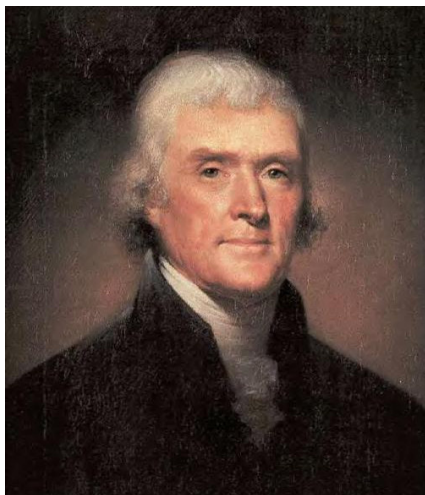
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Conclusions

- 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 bilateral mutual recognition takes place, with painful questions (ODs: 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.

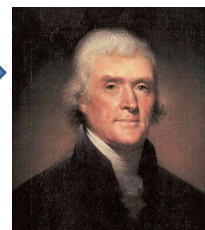
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This paper provides evidence on relative positions, but no insight into optimal level



Lemley (2001)
Rational ignorance?



Or Jefferson's
Hesitation?

van Pottelsberghe, 2010, The quality factor in patent systems, Bruegel Working Paper, 2010/03.

Selected References: (cfr. My RePEc page)

Archontopoulos E., D. Guellec, N. Stevnsborg, N. van Zeebroeck and B. van Pottelsberghe de la Potterie, 2007, When small is beautiful: measuring the evolution and consequences of the voluminosity of patent applications at the EPO, **Information Economics and Policy**, 19(2), 103-132.

Guellec D. and B. van Pottelsberghe de la Potterie, 2007, The Economics of the European Patent System, **Oxford University Press**, Oxford, 250 p.

Lazaridis G. and B. van Pottelsberghe de la Potterie, 2007, The rigour of the EPO patentability criteria: an insight into the "induced withdrawals", **World Patent Information**, 29(4), 317-326.

van Pottelsberghe de la Potterie B. and D. François, 2009, The cost factor in patent systems, **Journal of Industry, Competition and Trade**, 9(4), 329-355.

van Pottelsberghe de la Potterie B. and M. Mejer, 2009, The London Agreement and the relative cost of patenting in Europe, **European Journal of Law and Economics**, 29(2), 211-237.

van Pottelsberghe, 2010, The quality factor in patent systems, Bruegel Working Paper, 2010/03.

Selected References: (cfr. My RePEc page)

de Rassenfosse G., and B. van Pottelsberghe de la Potterie, 2009, A policy insight into the R&D-patent relationship, *Research Policy*, 38(5), 2009, June, 779-792.

van Pottelsberghe de la Potterie B., 2008, Europe's R&D: Missing the wrong targets?, *Intereconomics - Review of European Economic Policy*, 43(4), July/August, 220-225.

van Zeebroeck N., N. Stevnsborg, B. van Pottelsberghe de la Potterie, D. Guellec and E. Archontopoulos, 2008, Patent inflation in Europe, *World Patent Information*, 30(1), 43-52.

de Rassenfosse G., and B. van Pottelsberghe de la Potterie, 2007, Per un pugno di dollari: A first look at the price elasticity of patents, *Oxford Review of Economic Policy*, 23(4), 588-604.

van Pottelsberghe, 2010, The quality factor in patent systems, Bruegel Working Paper, 2010/03.