Fasten Your Seatbelts!
Can The Patent Prosecution Highway Take Your Application Down The Fast Lane?

ZEW
Zentrum für Europäische Wirtschaftsforschung GmbH
Centre for European Economic Research

Vanessa Behrens, Dirk Czarnitzki, Andrew Toole

Overarching Objective

To investigate the benefits from international patent work sharing programs to IP offices and patent owners.

→ PPH wants to speed up prosecution at the patent offices

Why is this important?

1. Globalization of business activities drives patent owners to secure patent rights for the same invention in multiple jurisdiction.

   = duplication

2. Economic inefficiencies (i.e. forgone transactions) increase when new technologies cannot be transferred and adopted quickly

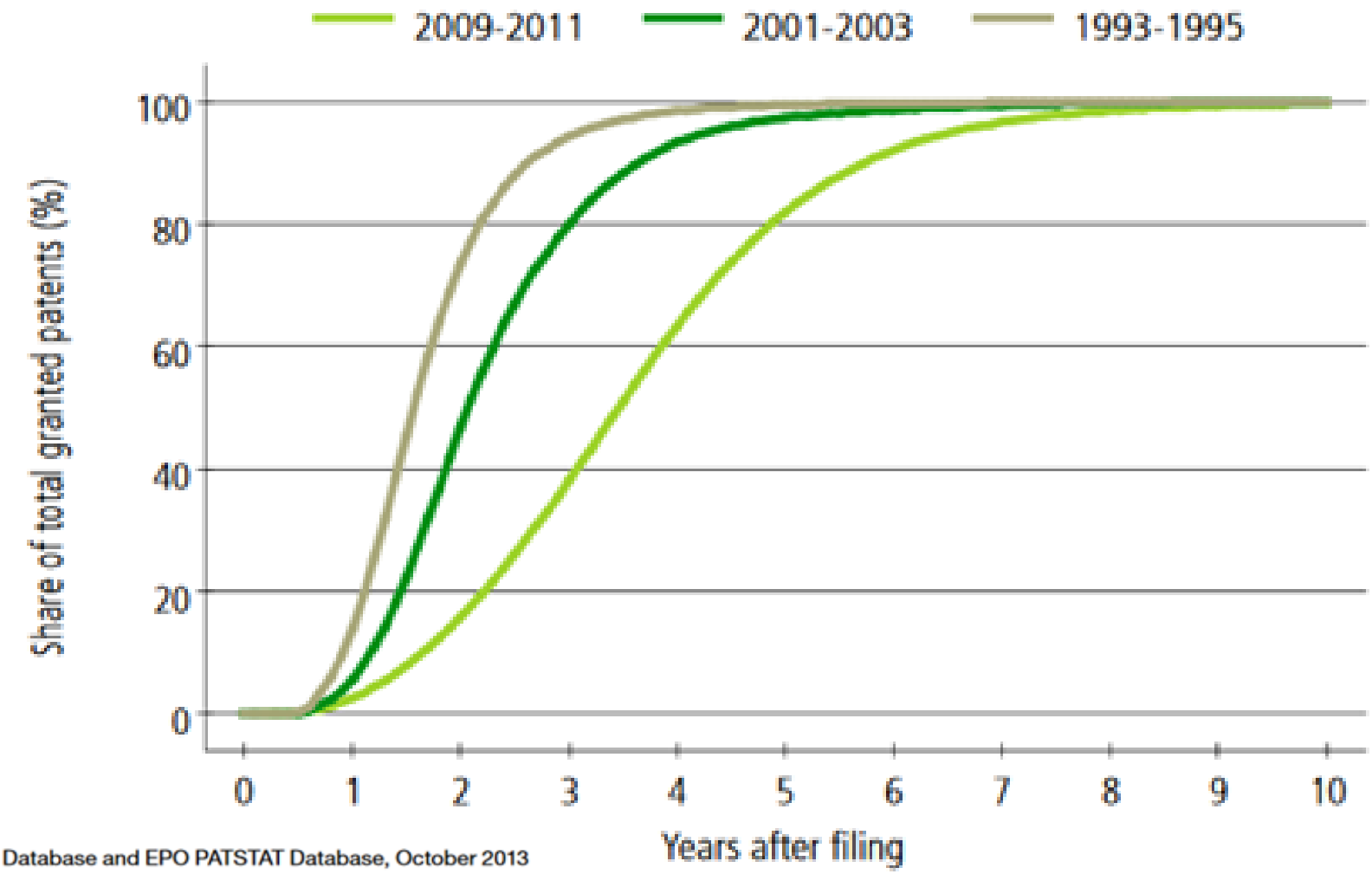
Motives

Consequences of longer pendency

Impedes forming licensing agreements (Gans, Hsu & Stern, 2008)
Reduces collaboration among same industry firms (Czarnitzki, Hussinger & Schneider, 2015)
Increased cost of uncertainty (delay investment/commercialisation)

Motives

Increase in Patent Pendency
United States of America

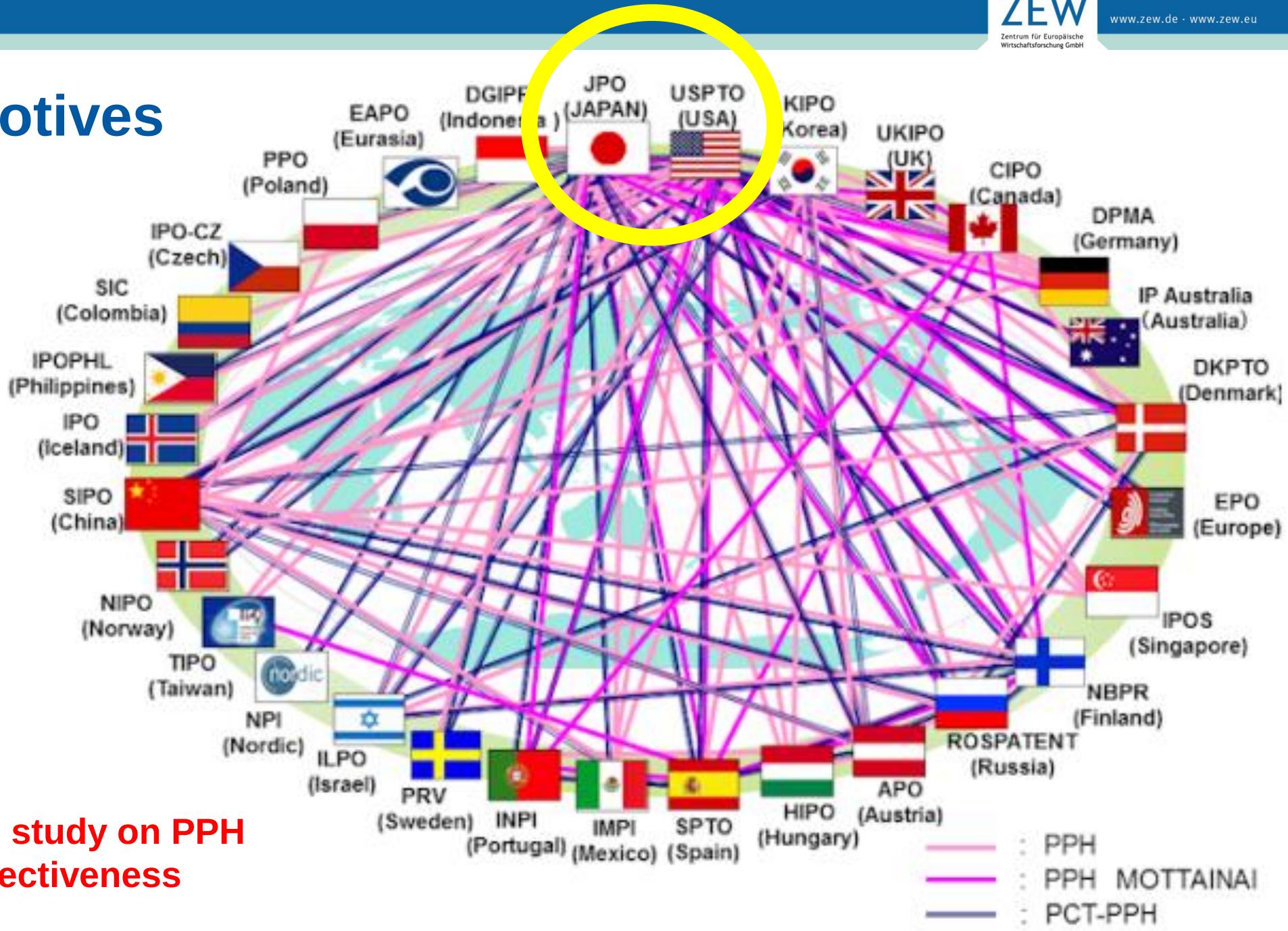


Sources: WIPO Statistics Database and EPO PATSTAT Database, October 2013

Motives

Patent Offices recognise importance of timely processing → PPH

Motives



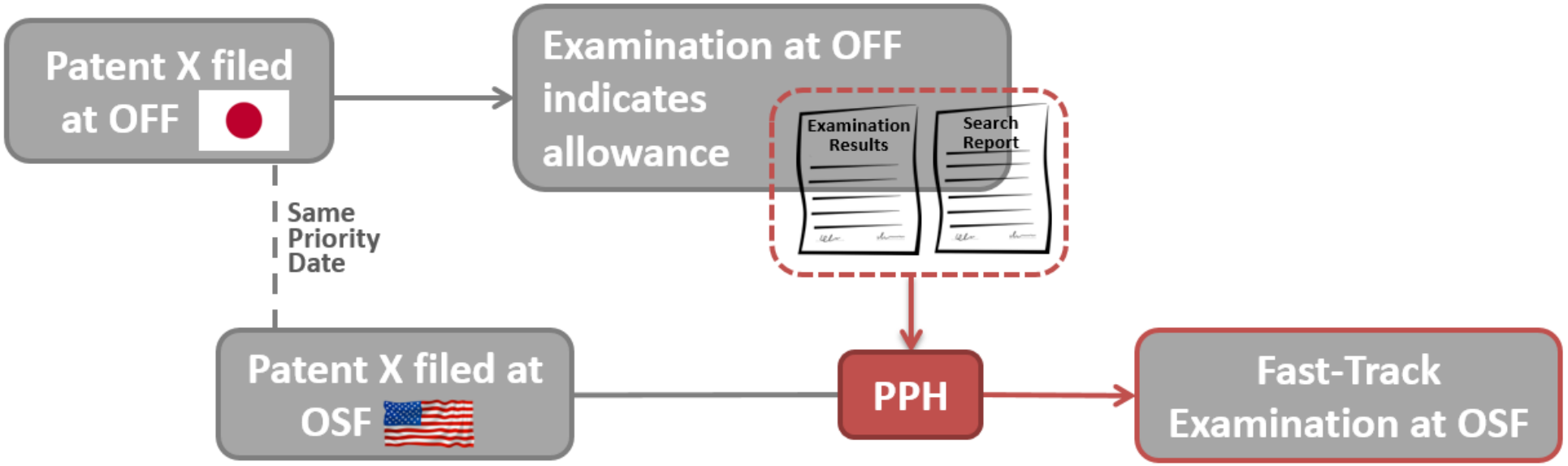
No study on PPH effectiveness

Specific Research Question

Has the Patent Prosecution Highway (PPH) been effective at reducing patent pendency?

Policy Description

2006 Bilateral Agreement US & Japan



Three Analytical Challenges

1. Applicants request PPH

   → non-random assignment induces selection bias → Restrict sample to those that requested PPH - Signal of wanting fast prosecution

2. Success simply due to USPTO-internal processing policies → **Comparison to PCT**

   (i) Same procesution clock during examination
   (ii) Search report and written opinion also available

3. Applicant-induced pendency → Split Pendency

Data

- Merged PatStat with USPTO's Public Pair
- PPH eligible applications (i.e. US filings with priority in Japan, where Japanese priority has been granted)
- Application years 2006-2012

Full Sample:

88,375 observations

all PPH eligible applications **(selection bias)**

6,446 (7.3%) entered the PPH

Reduced Sample:

6,561 observations

PPH applications

6,561 (100%) requested PPH

6,446 (92.9%) entered PPH

Descriptive Statistics

Reduced Sample

	Pendency (Days)		
	Non-PPH	PPH	
Overall	988	761	23% faster
Pre-Examination	295	277	
First Examination	519	325	
Post-First Examination	186	212	

Descriptive Statistics

Reduced Sample

	Non-PPH		PPH	
	Mean	SD	Mean	SD
PCT	0.33	0.47	0.53	0.50
No. Inventors	2.47	1.63	2.59	1.76
Claims	9.62	6.57	10.10	6.96
Citations	14.97	10.17	14.79	11.11
Issued	0.88	0.33	0.82	0.39

	Non-PPH	PPH
Computer technology	0.216	0.289
Audio-visual technology	0.148	0.259
Electrical machinery, apparatus, energy	0.176	0.109
Digital communication	0.038	0.093
Transport	0.155	0.082

Methodology

OLS Regression:

$$log\,PEND_i = \beta_0 + \beta_1 PPH_i + \beta_2 PCT_i + \beta_3\, PPH_i * PCT_i + \boldsymbol{X_i}\gamma + \varepsilon_i$$

Variable	Description	Pre-Exam	First Examination	Post-First Exam
PPH	=1 if patent underwent PPH	0	-	0
PCT	=1 if patent originated from PCT	+/-	-	0
PPH*PCT	=1 if patent underwent PPH and originated from PCT	-	-/0	-
X	# claims, # citations, small entitiy, technological classes, year dummies			

OLS Results

Full Sample: All PPH Eligible

PPH patents took around 30% less time to get processed

Effect largest during examination

PCTs take 22% longer in pre-examination stage

Selection Bias

Dependent Var: Log(Pendency)	(1) Total
PPH	-0.306***
	(0.008)
PCT	-0.006**
	(0.003)
PPH * PCT	-0.097***
	(0.011)
Constant	7.272***
	(0.006)
Observations	88,375
R-squared	0.319
Controls	YES
Technology Dummies	YES
Year Dummies	YES

Robust standard errc
*** p<0.01, ** p<

OLS Results

Restricted Sample: PPH requested

PPH patents took around 20% less time to get processed - around 180 days

Pre- and Post-Examination Stages become near insignificant – suggests we had applicant-induced pendency in full sample.

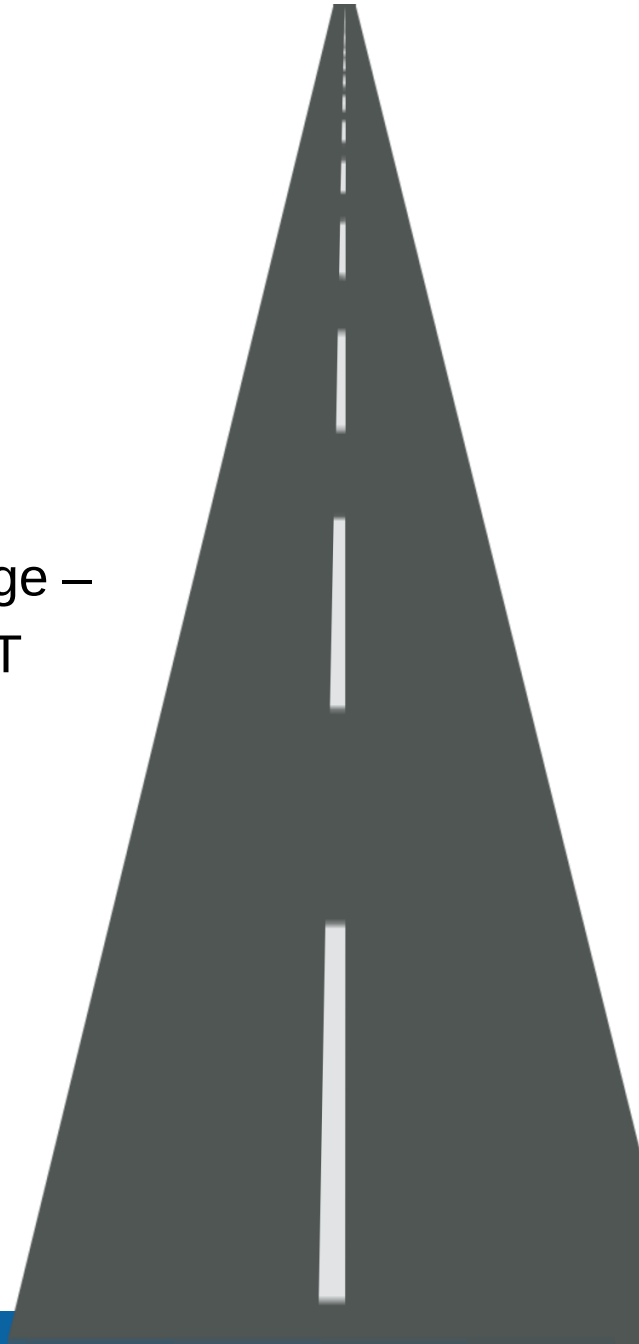
PPH more effective than PCT

Dependent Var: Log(Pendency)	(1) Total	(2) Pre-Examination	(3) First Examination	(4) Post-First Examination
PPH	-0.207***	0.059	-0.520***	-0.106*
	(0.020)	(0.048)	(0.061)	(0.057)
PCT	-0.156***	-0.076	-0.427***	0.101
	(0.042)	(0.087)	(0.114)	(0.119)
PPH * PCT	0.030	0.039	0.128	0.005
	(0.043)	(0.088)	(0.117)	(0.123)
Constant	7.221***	5.605***	7.073***	4.403***
	(0.037)	(0.084)	(0.092)	(0.131)
Observations	6,446	6,446	6,446	6,446
R-squared	0.278	0.189	0.114	0.058
Controls	YES	YES	YES	YES
Technology Dummies	YES	YES	YES	YES
Year Dummies	YES	YES	YES	YES

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Conclusion

- PPH speeds up your US patent application by 20% (around 180 days faster on average)
- PPH more effective than PCT
- Efficiency gain is from the PPH information advantage – based on shared office documents – (even over PCT applications with search reports)
- However, small number of PPH requests
  Implications: Consider making PPH automatic by aboloshing need to request?



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	Main Findings	Effects on „Pendency“
Gans, Hsu & Stern (2008) The Impact of Uncertain Intellectual Property Rights on the Market of Ideas: Evidence from Patent Grant Delays	The hazard rate for achieving a cooperative **licensing agreement** significantly increases after patent allowance.	Patent claims: + Patent classes: +*** Patent citations made: + Patent backward citation lag: +** Patent originality: + Science references: + Nonscience references: +
Czarnitzki, Hussinger & Schneider (2015) R&D Collaboration with Uncertain Intellectual Property Rights	Uncertainty in IPR (measured by longer patent pendencies) → **less collaboration** among firms in the same industry. Collaborations with universities, suppliers, or customers are not affected by uncertain IPR.	citation stock/patent stock (as a quality indicator for a firms' patent stock): +***
Johnson and Popp (2003) Forced out of the closet: Impact of American Inventors protection Act on timing of patent disclosure	patents that take longer to go through the application process are more significant/important inventions. The analysis also suggests that earlier disclosure should provide benefits to future inventors due to faster knowledge diffusion. Consider granted patents only.	
Johnson and Popp (2004) The time in purgatory: determinants of the grant lag for U.S. patent applications	Applications in **newer, more complex technologies** take significantly longer than other patent applications.	Number of citations: + Number of claims: + Number of Drawings: + Number of Sheets: -
Harhoff and Wagner (2009) The Duration of Patent Examination at the European Patent Office	Potentially **valuable patents** will be granted significantly earlier than less valuable ones, and a withdrawal of such patents will be delayed considerably.	Request for accelerated examination: -*** PCT application: +*** Citations received within 3 years: +*** Share of type X citations: +