



THE LONDON SCHOOL  
OF ECONOMICS AND  
POLITICAL SCIENCE ■



Grantham Research Institute on  
Climate Change and  
the Environment

# **Fast-tracking green patent applications: An empirical analysis**

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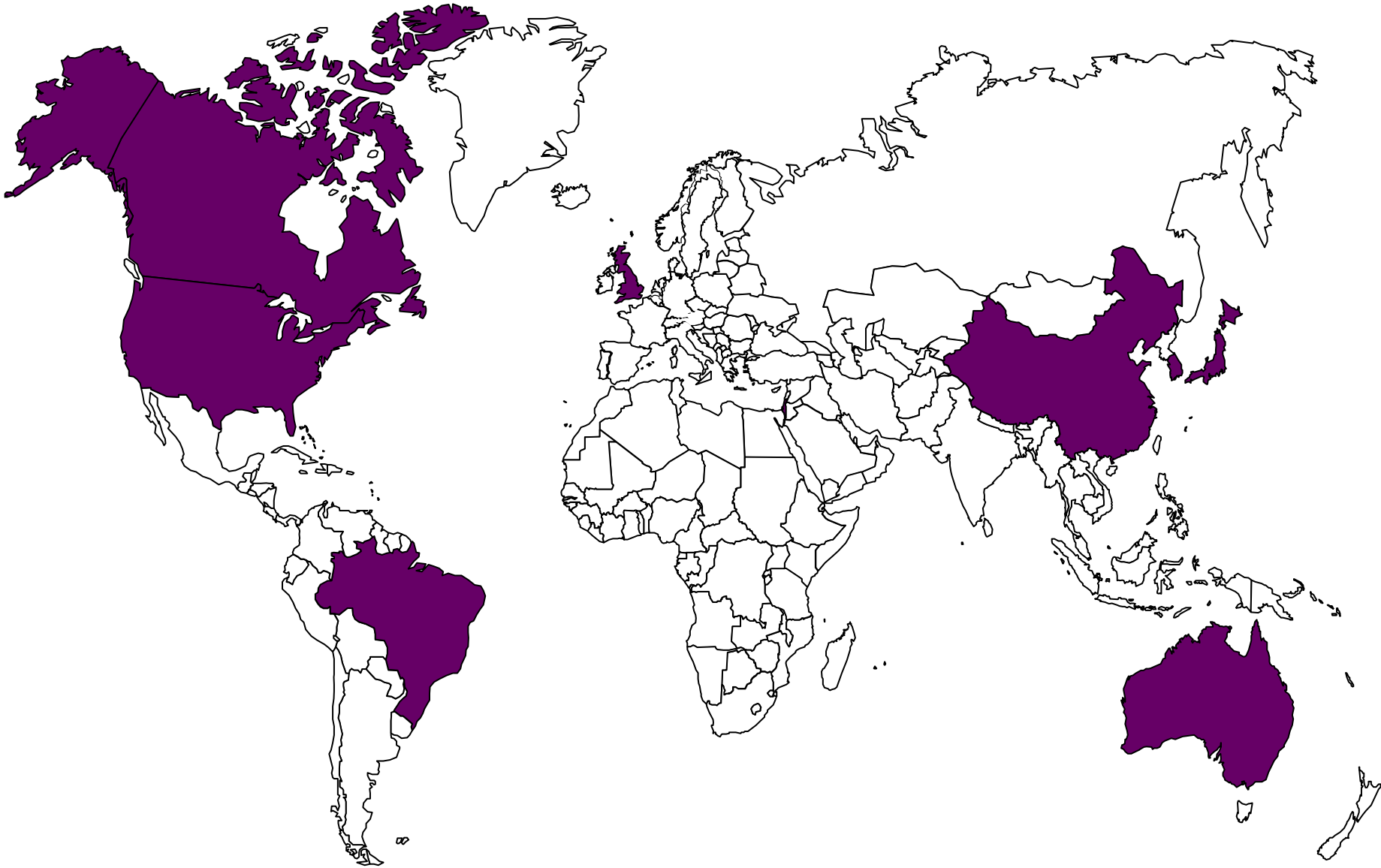
# Fast-track programmes

- In May 2009 the UK IPO set up a fast-track programme for green patents
- Today 8 intellectual property offices have programmes to fast track 'green' patent applications
  - Including in emerging economies (China, Brazil)
  - USPTO pilot programme now ended

# Fast-tracking countries



# Fast-tracking countries



# What are these programmes?

- Allow patents covering green technologies to be examined as a matter of priority
  - Green technologies = list of patent classification codes or (mostly) to the examiner's discretion
- Objectives
  - Reduce time needed to obtain a granted patent
  - Allow applicants to start selling/licensing their technology sooner
  - Publish patent sooner
  - ➔ Accelerate the diffusion of clean technologies?

# This paper

- An up-to-date picture of the green patent fast-track programmes landscape
  - Based on data from 7 offices (programmes in China and Brazil still young)
- Have these programmes been successful?
  - What is the uptake?
  - Do they reduce time to grant?
- Are these programme useful?
  - Do they accelerate the diffusion of clean technologies?
  - Is this pure green washing?

# Outline

1. Participation into the programmes
2. The characteristics of patents
3. The programmes' users
4. Are the programmes delivering?
5. Take-home messages

# A mild participation

Country	Number of fast-tracked green patent applications
Australia	43
Canada	67
Israel	78
Japan	220
Korea	604
UK	776
US	3533



# Understanding the low usage rate

- Accelerated examination may add costs to the application in some patent offices
  - JPO require some prior art search
- Awareness of the programmes may be low
- Patent applicants have a strong incentive to keep their patent applications in the examination process for as long as possible

# The trade-off

- Need to secure patent protection as early as possible (priority)
- But advantages of a long examination process:
  - Pushes back costs associated with grant
  - Gives applicants time to determine whether the patent will be commercially viable and worth requiring grant
  - Allows applicants to adjust the claims so that the patent matches the final version of the invention
  - A published patent reveals information to competitors (but only 18% of requests filed after publication)

# It's not that bad

- Patent applicants have an interest in using fast-tracking programmes *only under specific circumstances*
  - securing commercial partnerships / licensing agreements
  - capital raising activity
  - suspicion of infringement
- 100% participation cannot be expected
- High participation rate in the UK shows that there is a clear demand for this type of mechanism

# Patent offices concerns with backlogging were overdone

- Measures to limit participation:
  - Fees or additional costs
  - Restricted subject matter eligibility (USPTO, Korea, Japan: based on patent classification classes)
  - Process requirements (USPTO, Brazil: restriction on the number of claims)
  - Exclusion of PCT applications (Brazil)
- Participation was much lower than expected
- Restrictions can be (and are being) lifted

# Crowding-out: a non issue?

- Fast-tracking of green patents may postpone examination of patents in other technologies
- The UK programme suggests 80% of “crowded-out” patents are happy to be postponed!
  - Assuming fast-tracking is also appealing for max 20% of patents in non-green technologies
  - Potential problem is for these 20% (1,000 patent applications so far...)

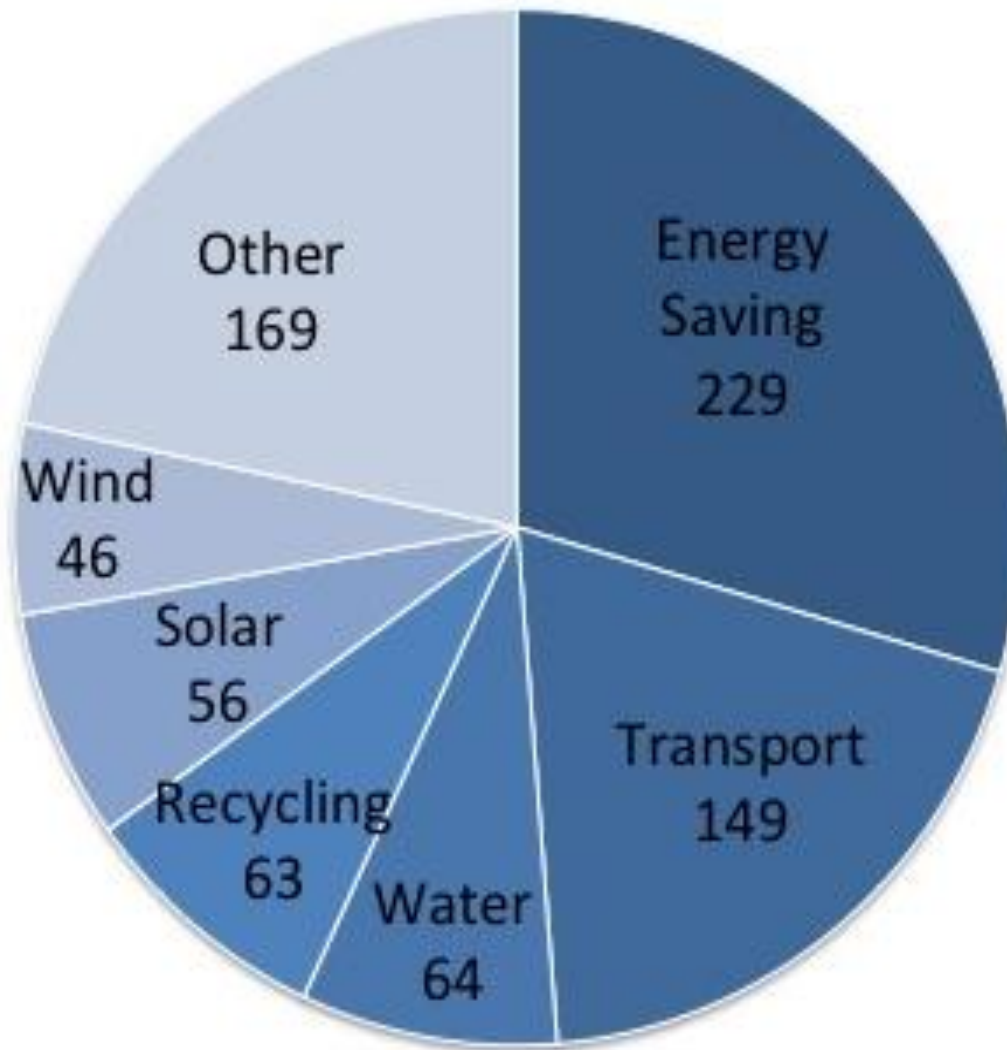
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# Technology distribution

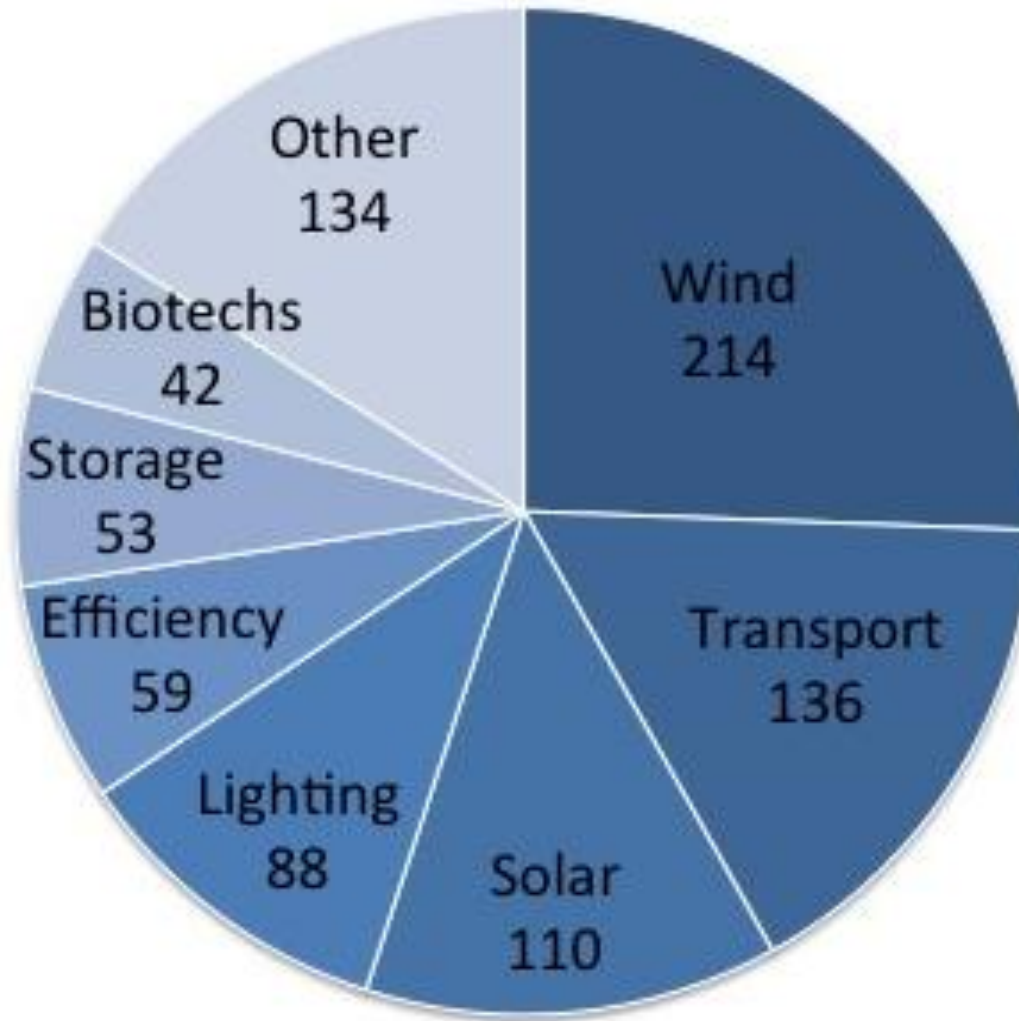
- Majority of patent applications: climate change-related technologies (in particular renewables)
  - Main technology in Australia and Canada is CCS
- Other environmental technologies (recycling, pollution control) = 20%
  - Israel: 30% of patent applications cover water-saving technologies

# UK



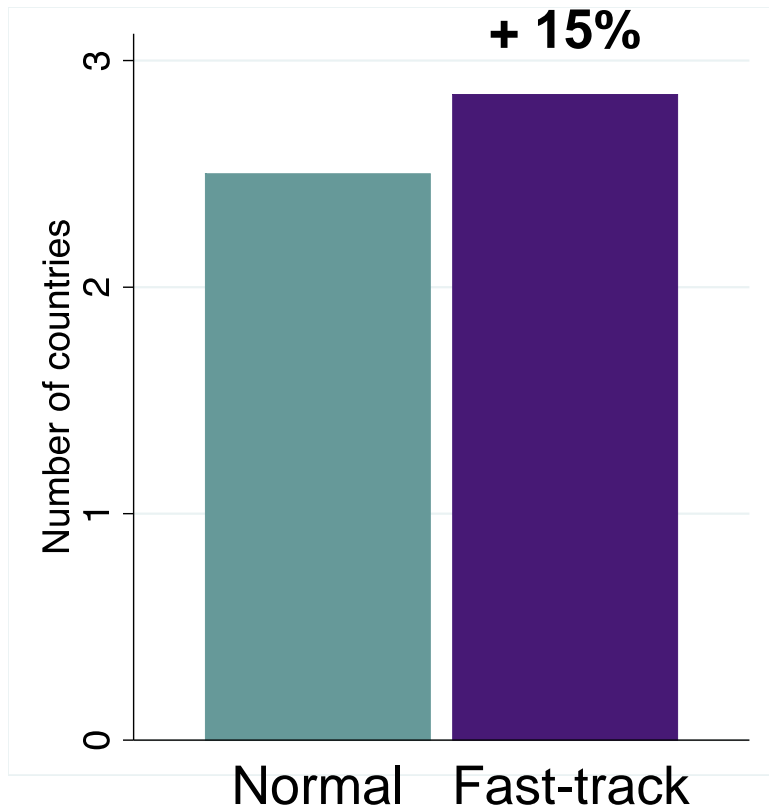


# USA

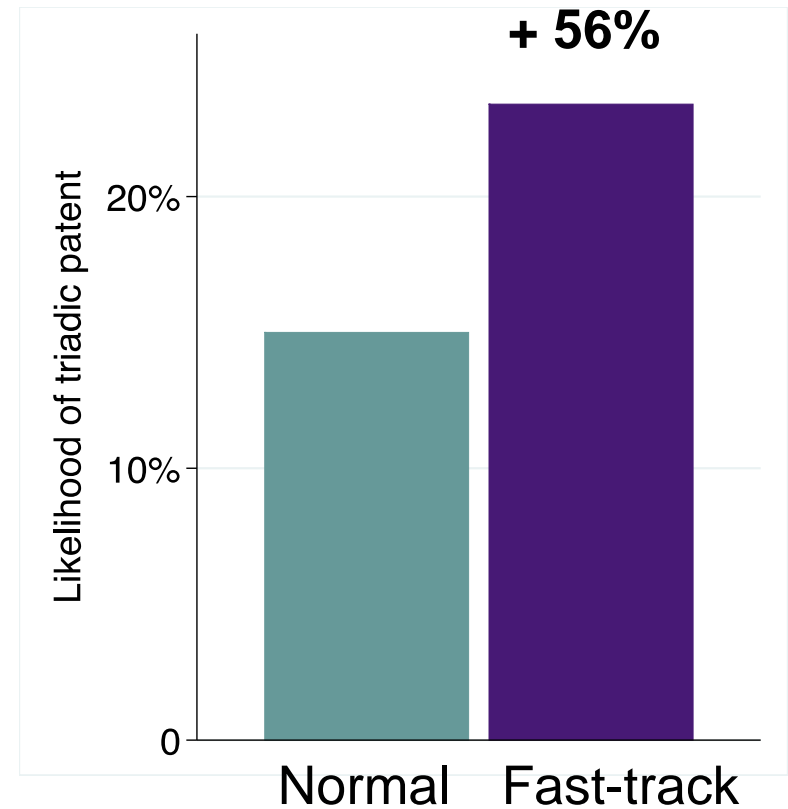


# FT patents are of higher value

## Family size



## Triadic patents

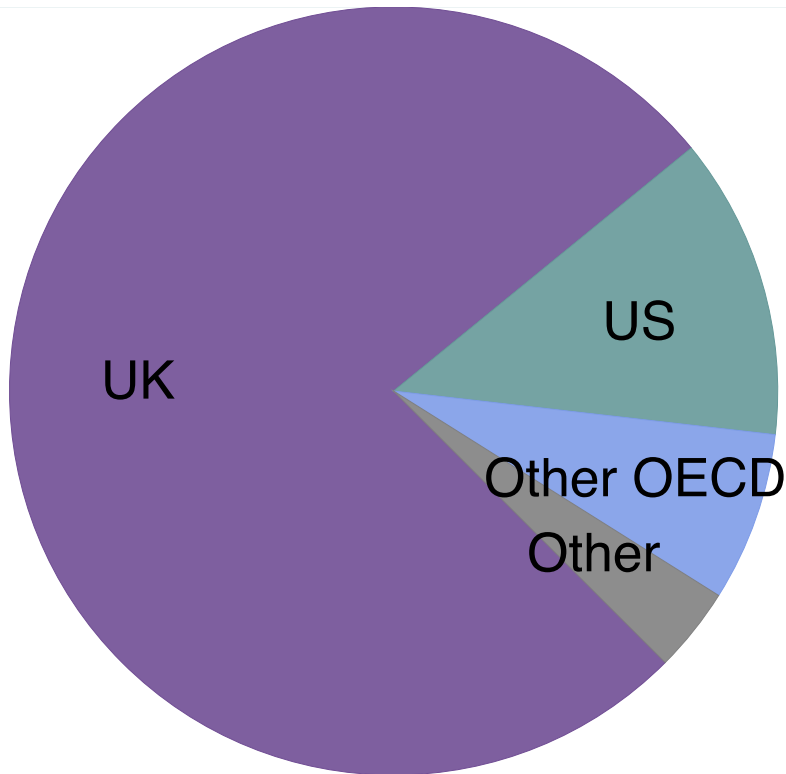


# Outline

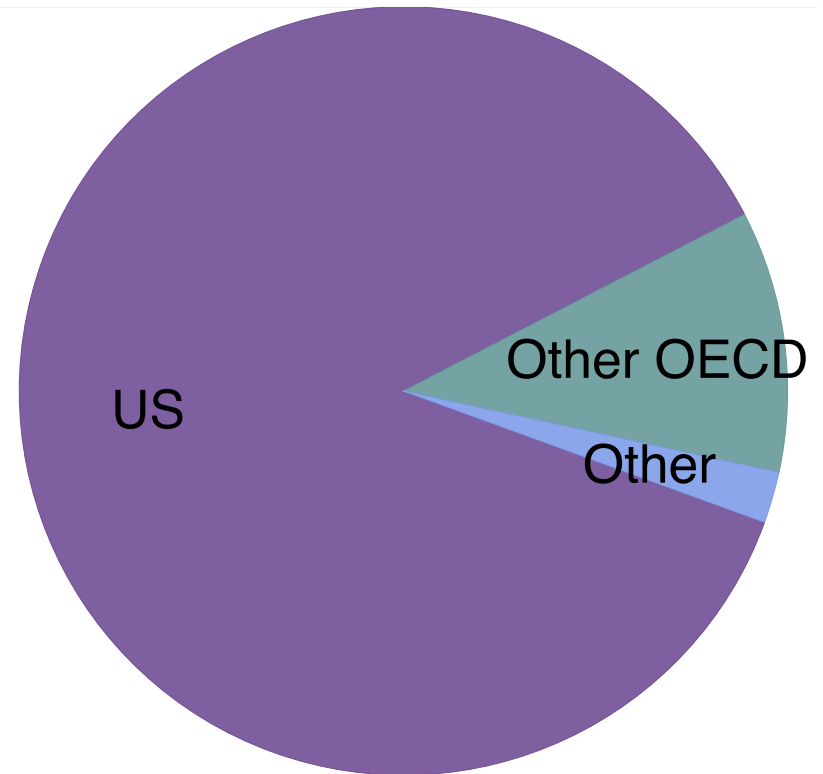
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# Users are mostly domestic

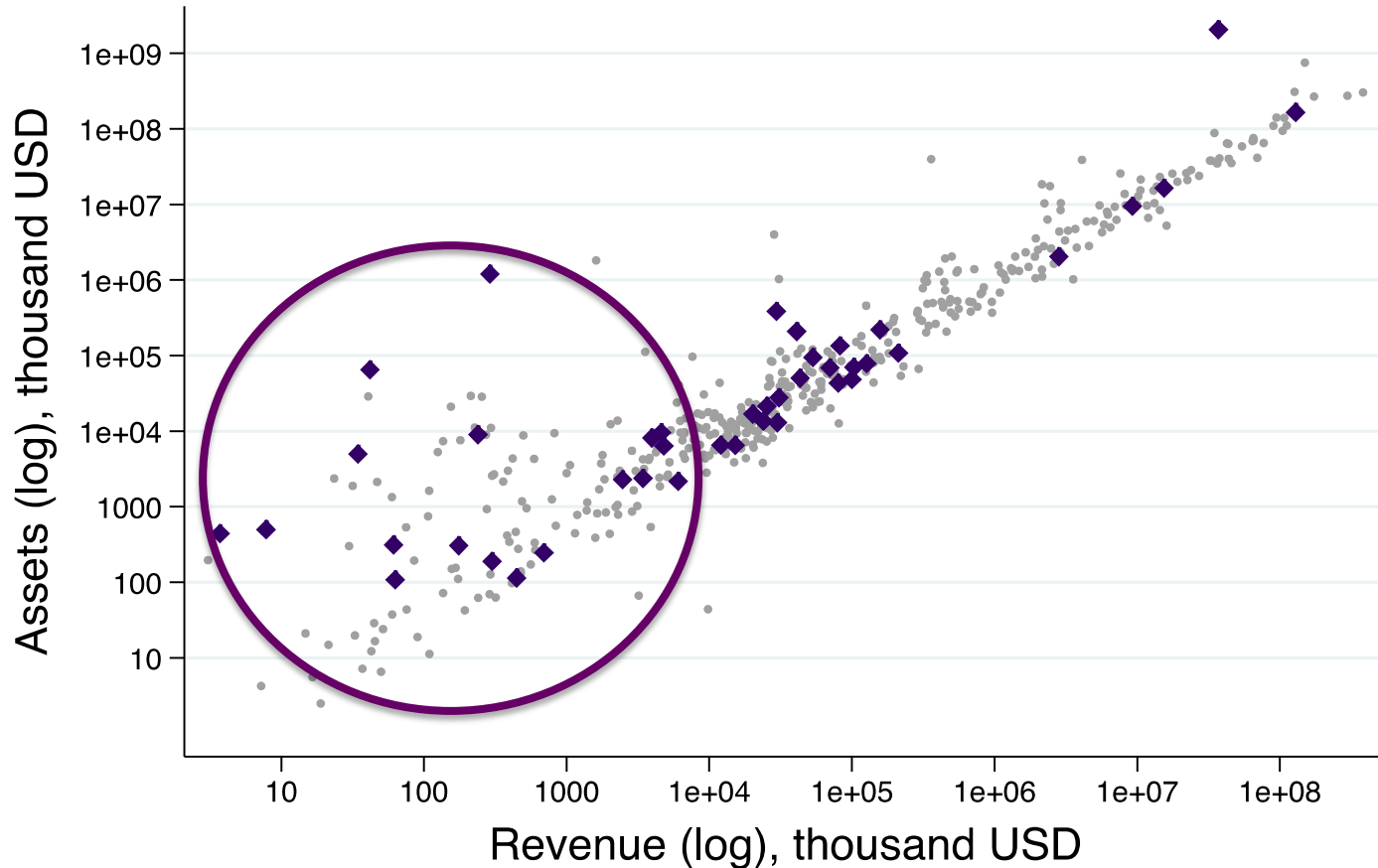
UK



US



# Start-ups use fast track a lot

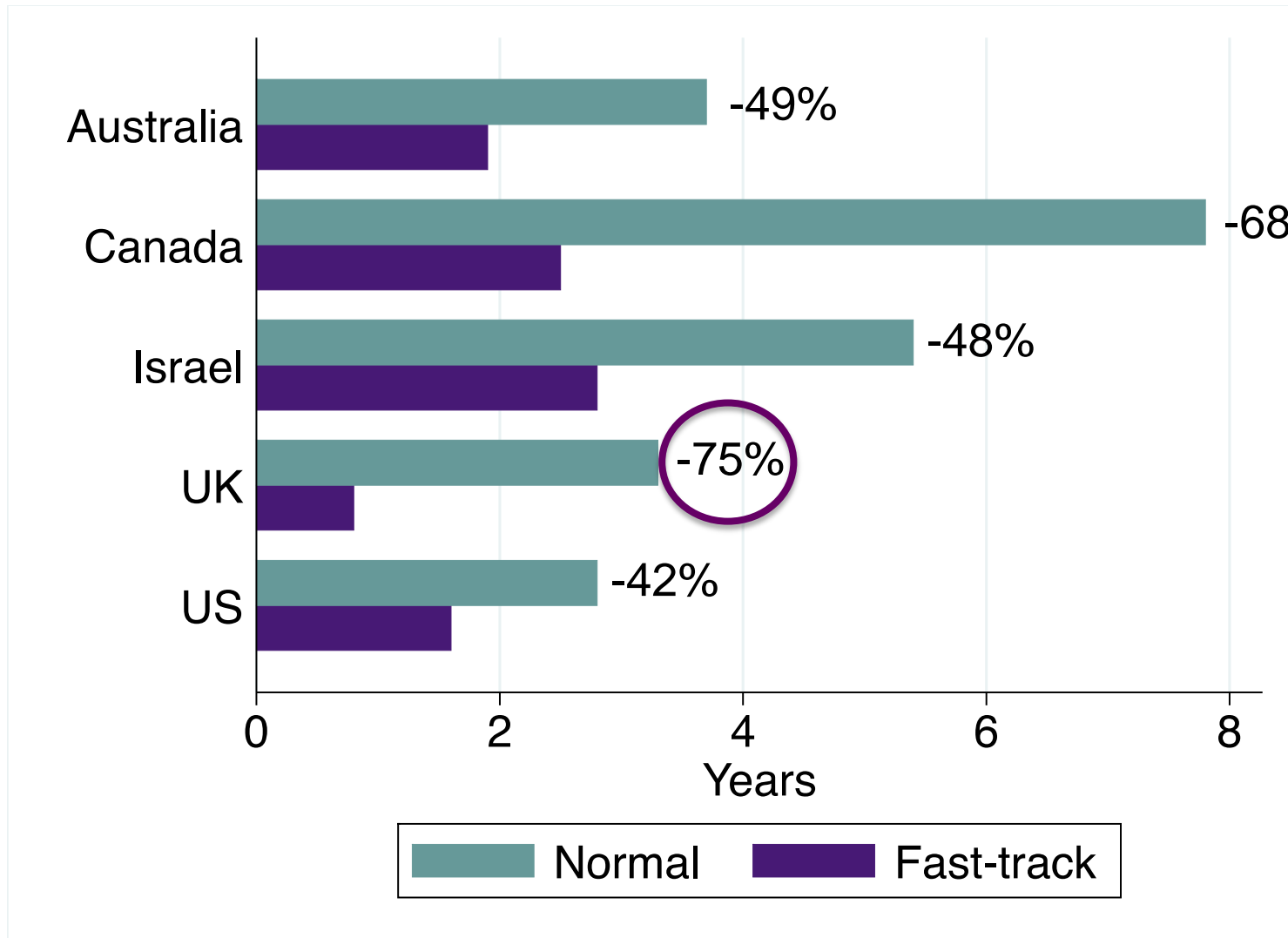


• All UK IPO patent applicants    ◆ Fast-track users

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# Fast-tracking reduces time to grant



# Faster knowledge diffusion

- We use patent citations to analyse diffusion of technological knowledge
  - Trajtenberg (1990); Hall et al. (1991); Griliches (1992); Jaffe et al (1993); Henderson, Jaffe and Trajtenberg (1996); Thompson and Fox-Kean, (2005)
- Compared with other patents (filed in the same month & of similar quality), fast-tracked patents received **twice as many citations** in the same time period
- Fast-tracking programmes accelerate the diffusion of knowledge in green technologies *in the short run*



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# There is a demand for fast-tracking programmes

- Only a small share (<20%) of green patents request accelerated examination, but this was to be expected
  - Applicants have a strong incentive to keep their patent applications in the examination process
  - Participation could be enhanced by increasing communication and decrease associated costs
- Overall participation and the high usage rate in the UK show that there is a clear demand for this type of mechanism

# FT programmes introduce welcomed flexibility

- Patent applicants who can benefit from an early grant can choose to request accelerated examination
  - Start-up companies in green tech business, who can use a granted patent to raise capital or to license
- Should patent offices restrict such programmes to green patents only?
  - *No*: difficult to identify green patents (2 patents out of 3 are *not* categorized as green using the usual OECD/EPO patent classification codes)
  - Crowding out issues

# Fast-tracking is keeping up with its promises

- Time from application to grant is reduced by 42% to 75%
- Granted patents can be licenced sooner, so the technologies can diffuse
- Fast-tracking programmes have accelerated the diffusion of technological knowledge in green technologies *in the short run*
  - This is encouraging
  - Whether this effect will remain in the long run is an open question

Thank you

Back up

**Table 5 — Patent value**

Dep. Var.	(1)	(2)	(3)	(4)	(5)	(6)
	Family size		Triadic patent		Claims	
Fast-track	0.151*** (0.029)	0.144*** (0.029)	0.278*** (0.056)	0.561*** (0.104)	0.312*** (0.015)	0.343*** (0.015)
Patent office X Month FE	yes	yes	yes	yes	yes	yes
Observations	2255141	2255141	2255141	2255141	850210	850210

Notes: \*=significant at the 10% level, \*\*=significant at the 5% level, \*\*\*=significant at the 1% level. The dependent variable is the number of patent offices in which each country is filed (family size) in columns (1) and (2) and is the number of claims made by each patent in columns (5) and (6). Columns (1) and (5) estimated by Poisson pseudo-maximum likelihood and column (2) and (6) estimated by negative binomial maximum likelihood. The dependent variable is a dummy variable that takes on the value of 1 if the patent is triadic in columns (3) and (4). Column (3) estimated by probit and column (4) estimated by logit. All equations include 166 dummy variables for each office - application month, a dummy variable for "green" patent according to the EPO classification and a constant. Robust standard errors in parentheses.

**Table 6 — Knowledge diffusion**

Dep. Var.	(1)	(2)	(3)	(4)	(5)	(6)
	All forward citations			Forward citations by applicants		
Fast-track	1.534*** (0.064)	1.536*** (0.064)	1.322*** (0.069)	0.559*** (0.153)	0.536*** (0.152)	0.562*** (0.164)
Family size		-0.004*** (0.001)	0.007*** (0.001)		0.036*** (0.002)	0.031*** (0.003)
Claims			0.015*** (0.000)			0.012*** (0.000)
Patent office X Month FE	yes	yes	yes	yes	yes	yes
Observations	2221075	2221075	849465	2221075	2221075	849465

Notes: \*=significant at the 10% level, \*\*=significant at the 5% level, \*\*\*=significant at the 1% level. The dependent variable is the total number of citations received by each patent in columns (1) to (3) and the number of citations received by each patent *and made by applicants only* in columns (4) to (6). All columns are estimated by Poisson pseudo-maximum likelihood. All equations include 166 dummy variables for each office - application month, a dummy variable for "green" patent according to the EPO classification and a constant. Robust standard errors in parentheses.