Intellectual Property Office

Australian Government
IP Australia

Patent backlogs, inventories, and pendency: An international framework

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Overview

- Background
  - Trends in “backlogs”
- Methodology
  - Facilitate international comparisons of patent backlogs
- Results
  - Investigate the relationship between backlogs and pendency
    - Australia insights
    - UK Insights
    - US Insights
- Conclusions

Background

What is the backlog?

- The total number of pending applications?
- The number of unexamined applications waiting in the queue?
- The number of applications not having requested search or examination?
- The number of applications that exceed office capacity?

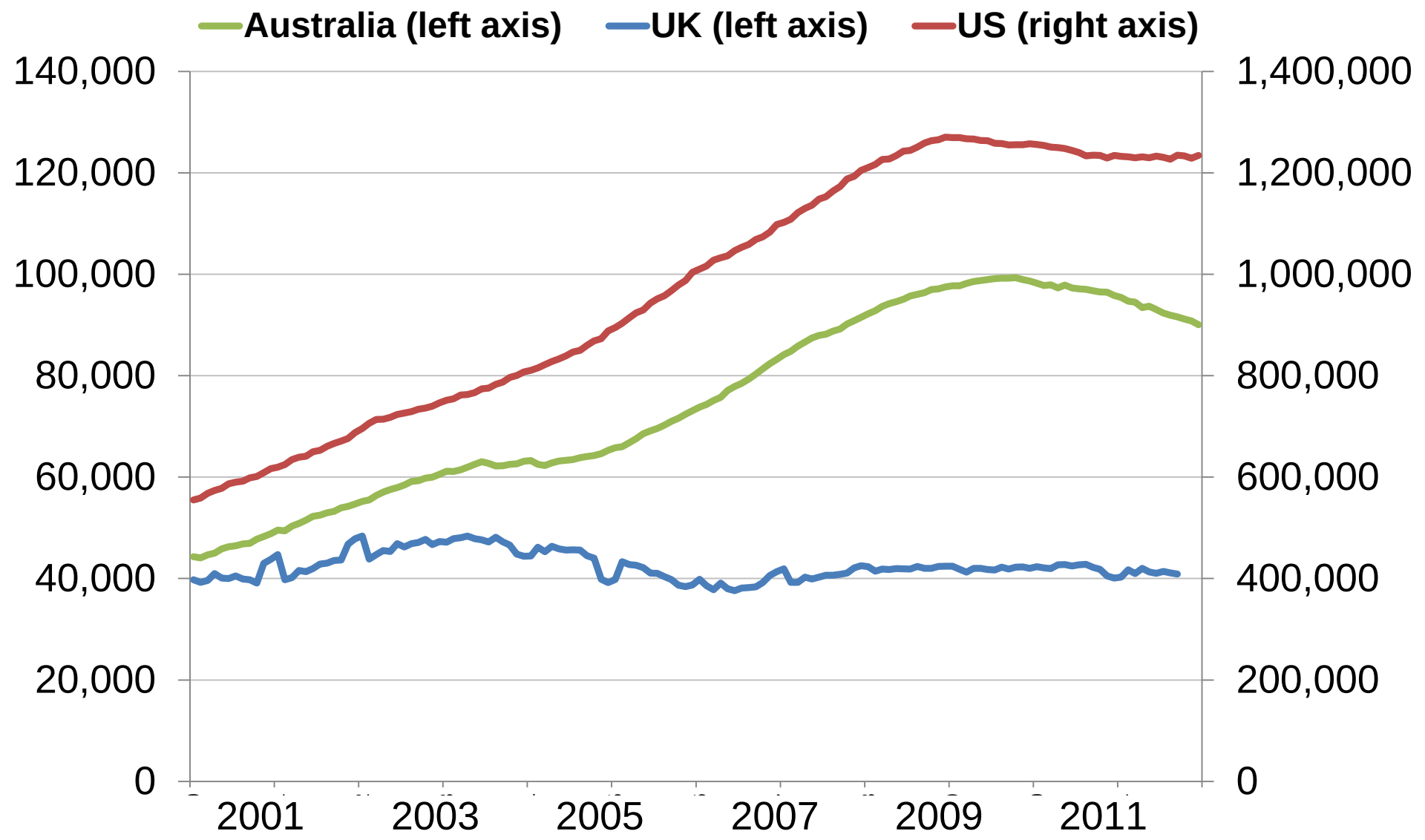
Well defined “inventory” and “stocks”

B’log

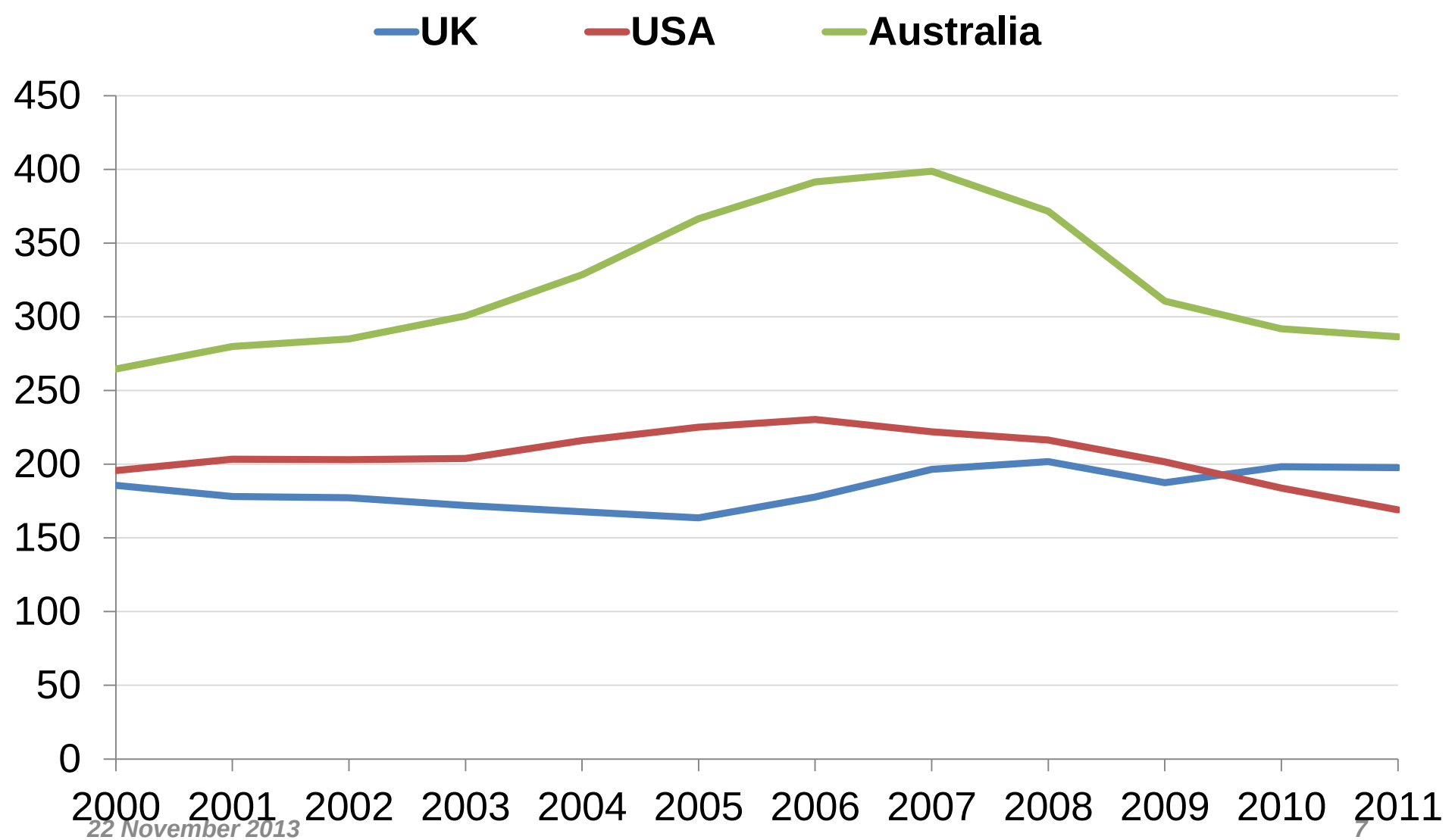
Disclaimer…

- The country-specific analyses benefited from collaboration as to methodology and presentation but remain the product of their respective individual country teams and do not necessarily reflect the official views of any other country or patent office.
- Please note that this work uses research datasets which may not exactly reproduce the official statistics of the UK IPO or the USPTO.
- As this new framework for international comparison is experimental, figures are preliminary and may change subject to more detailed work and data checks

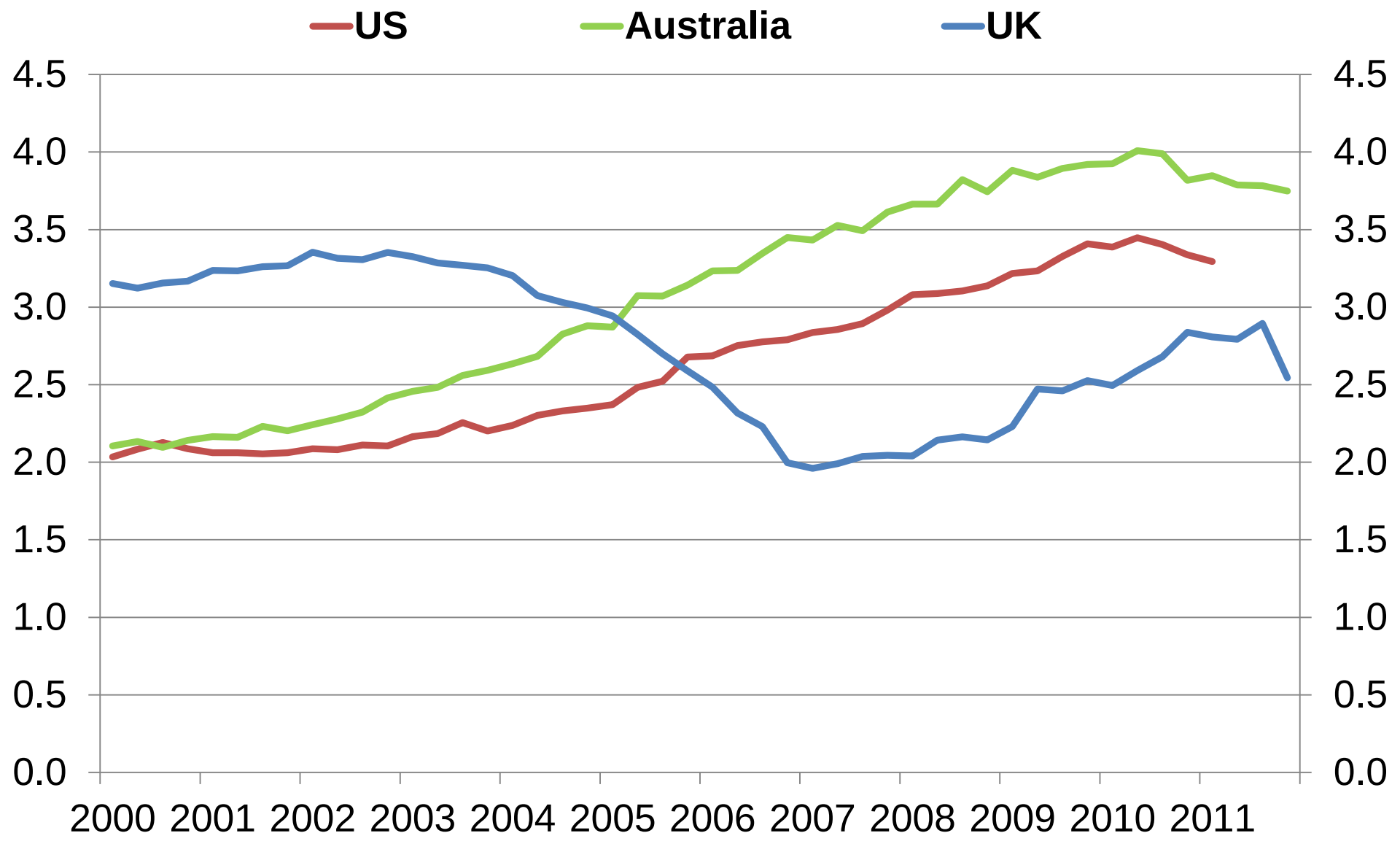
Trends: Inventory



Trends: Inventory per examiner



Trends: Exit Pendency



Methodology

Comparing the two systems

UK

- Separate search and examination (optional CSE)

US

- Combined search and examination

AUS

- 5 Year delayed examination

Comparing the two systems

UK

- Separate search and examination (optional CSE)
- Opt-in search/exam

US

- Combined search and examination
- Opt-out search/exam

AUS

- 5 Year delayed examination
- Opt-in exam request

Comparing the two systems

UK

- Separate search and examination (optional CSE)
- Opt-in search/exam
- Fees paid upon search/exam request

US

- Combined search and examination
- Opt-out search/exam
- Fees for search/exam paid at time of filing

AUS

- 5 Year delayed examination
- Opt-in exam request
- Fees paid on filing and at exam request

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UK

- Separate search and examination (optional CSE)
- Opt-in search/exam
- Fees paid upon search/exam request
- Statutory abandonment at 4.5 years subject to 12 months after the first exam report

US

- Combined search and examination
- Opt-out search/exam
- Fees for search/exam paid at time of filing
- Abandonment primarily for failure to respond

AUS

- 5 Year delayed examination
- Opt-in exam request
- Fees paid on filing and at exam request
- Deemed abandoned 12 months after first exam report if unresolved. (21 under old law)

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UK

- Separate search and examination (optional CSE)
- Opt-in search/exam
- Fees paid upon search/exam request
- Statutory abandonment at 4.5 years subject to 12 months after the first exam report
- Multiple rounds of amendments

US

- Combined search and examination
- Opt-out search/exam
- Fees for search/exam paid at time of filing
- Abandonment primarily for failure to respond
- Multiple rounds of amendments or Requests for Continued Examination (RCEs)

AUS

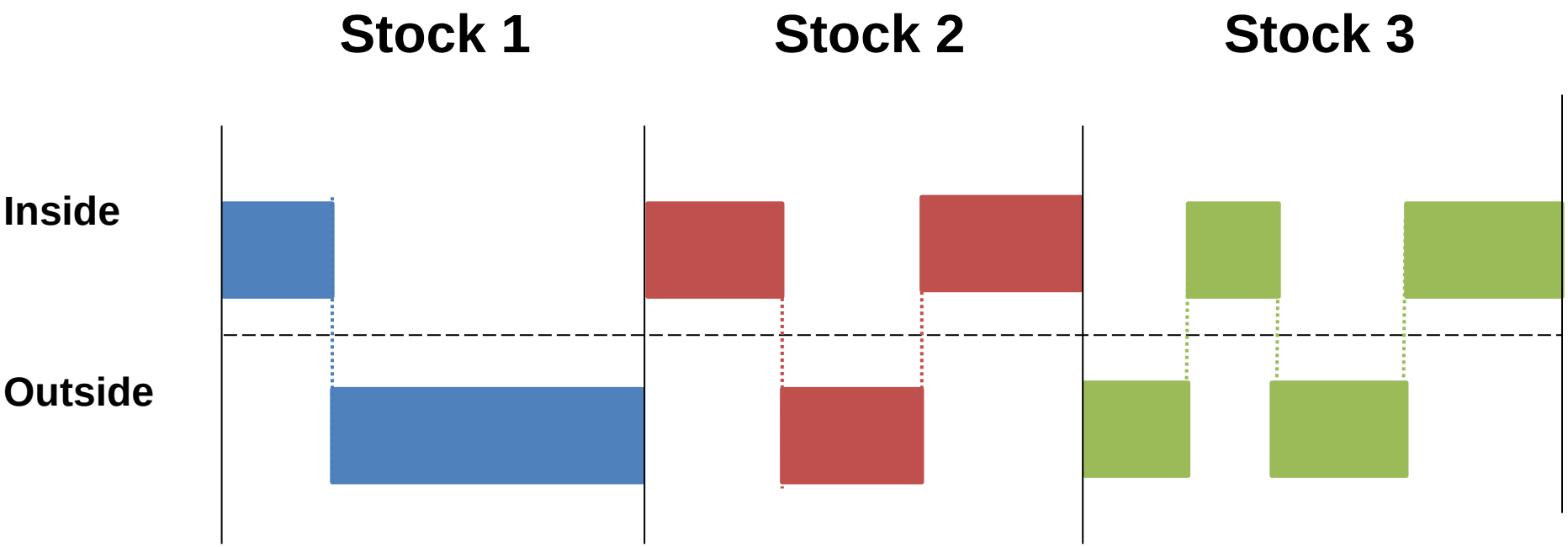
- 5 Year delayed examination
- Opt-in exam request
- Fees paid on filing and at exam request
- Deemed abandoned 12 months after first exam report if unresolved. (21 under old law)
- Opposition period of 3 months before grant

Identifying common milestones

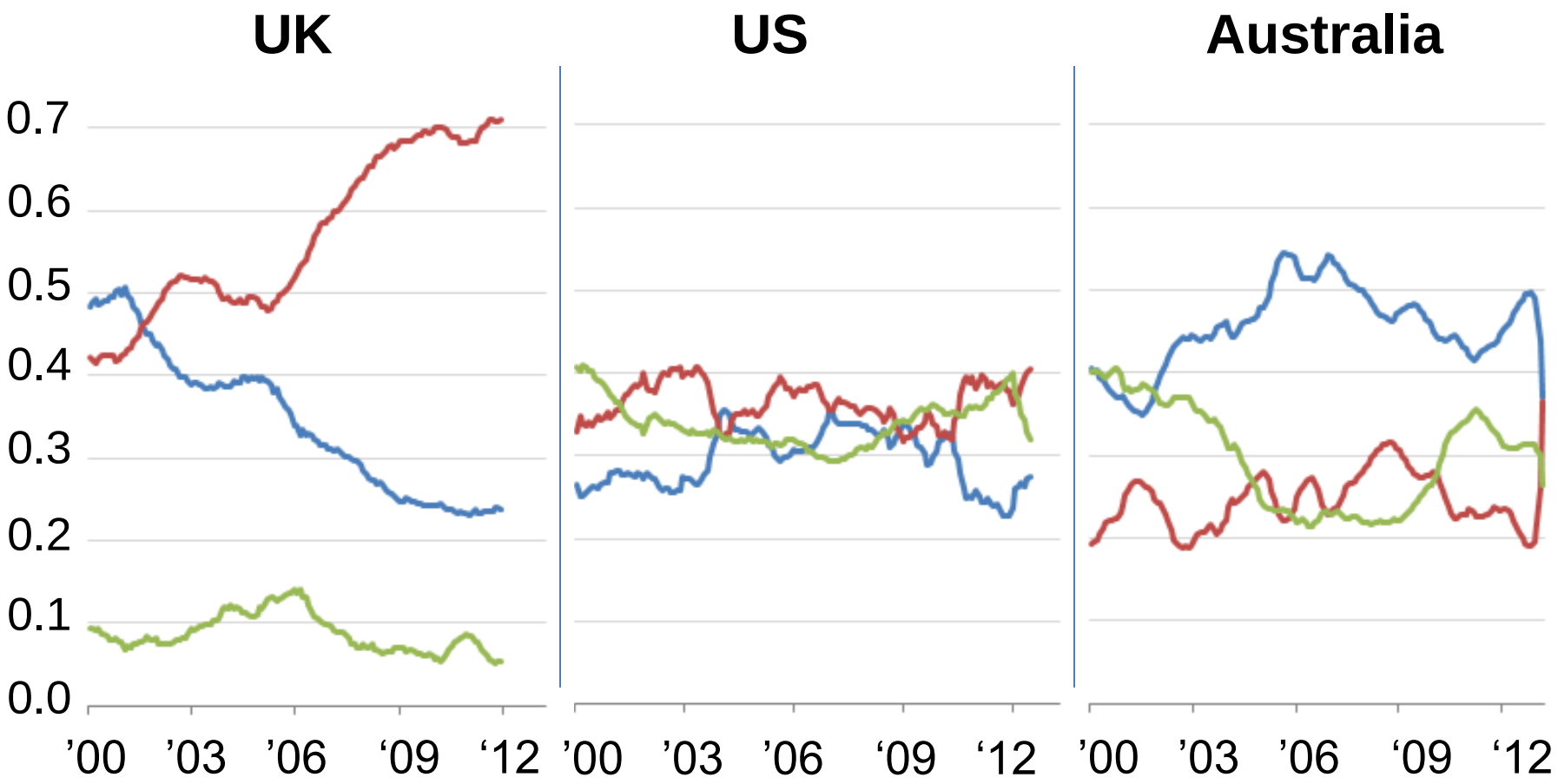
1. Received in the office
2. Ready for examiner action
3. Completed first examination
4. Disposed in terminal action

Application stocks

Application stocks



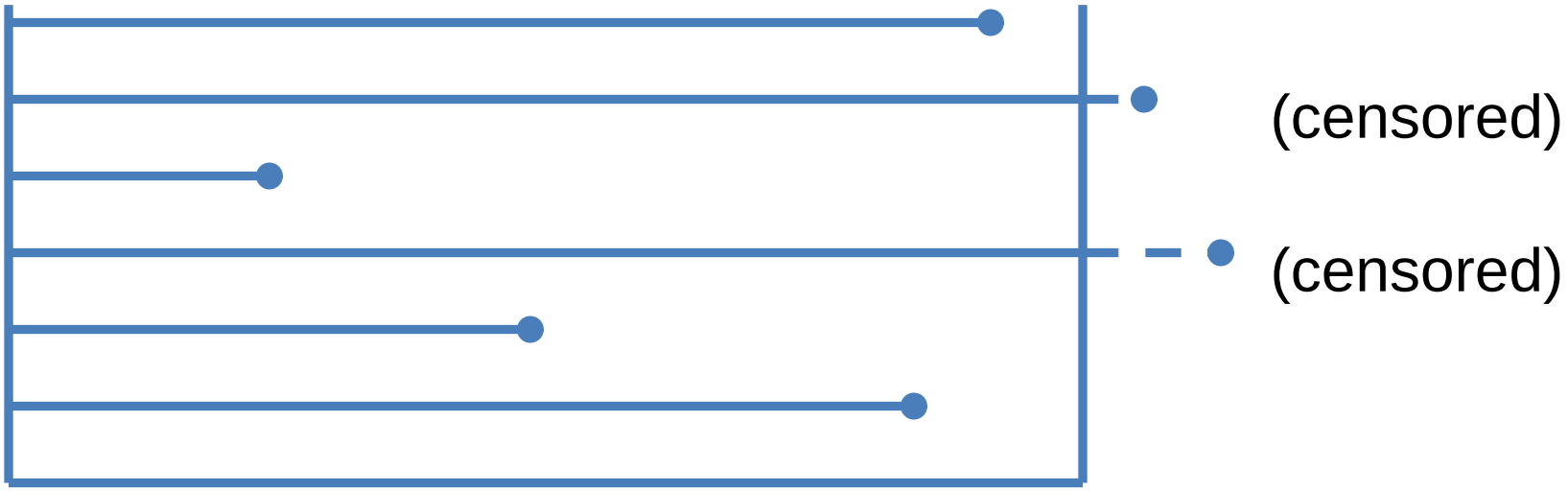
Trends in stocks



Stock 1 **Stock 2** **Stock 3**

Survival time analysis

Time to disposal →



Maximum likelihood estimation with censoring

$$L(\theta) = \prod_{T_i \in unc.} \Pr(T = T_i|\theta) \prod_{i \in l.c.} \Pr(T < T_i|\theta) \prod_{i \in r.c.} \Pr(T > T_i|\theta) \prod_{i \in i.c.} \Pr(T_{i,l} < T < T_{i,r}|\theta).$$

For an uncensored datum, with T_i equal to the age at death, we have

$$\Pr(T = T_i|\theta) = f(T_i|\theta).$$

For a left censored datum, such that the age at death is known to be less than T_i, we have

$$\Pr(T < T_i|\theta) = F(T_i|\theta) = 1 - S(T_i|\theta).$$

For a right censored datum, such that the age at death is known to be greater than T_i, we have

$$\Pr(T > T_i|\theta) = 1 - F(T_i|\theta) = S(T_i|\theta).$$

For an interval censored datum, such that the age at death is known to be less than $T_{i,r}$ and greater than $T_{i,l}$, we have

$$\Pr(T_{i,l} < T < T_{i,r}|\theta) = S(T_{i,l}|\theta) - S(T_{i,r}|\theta).$$

Key insights from Oz

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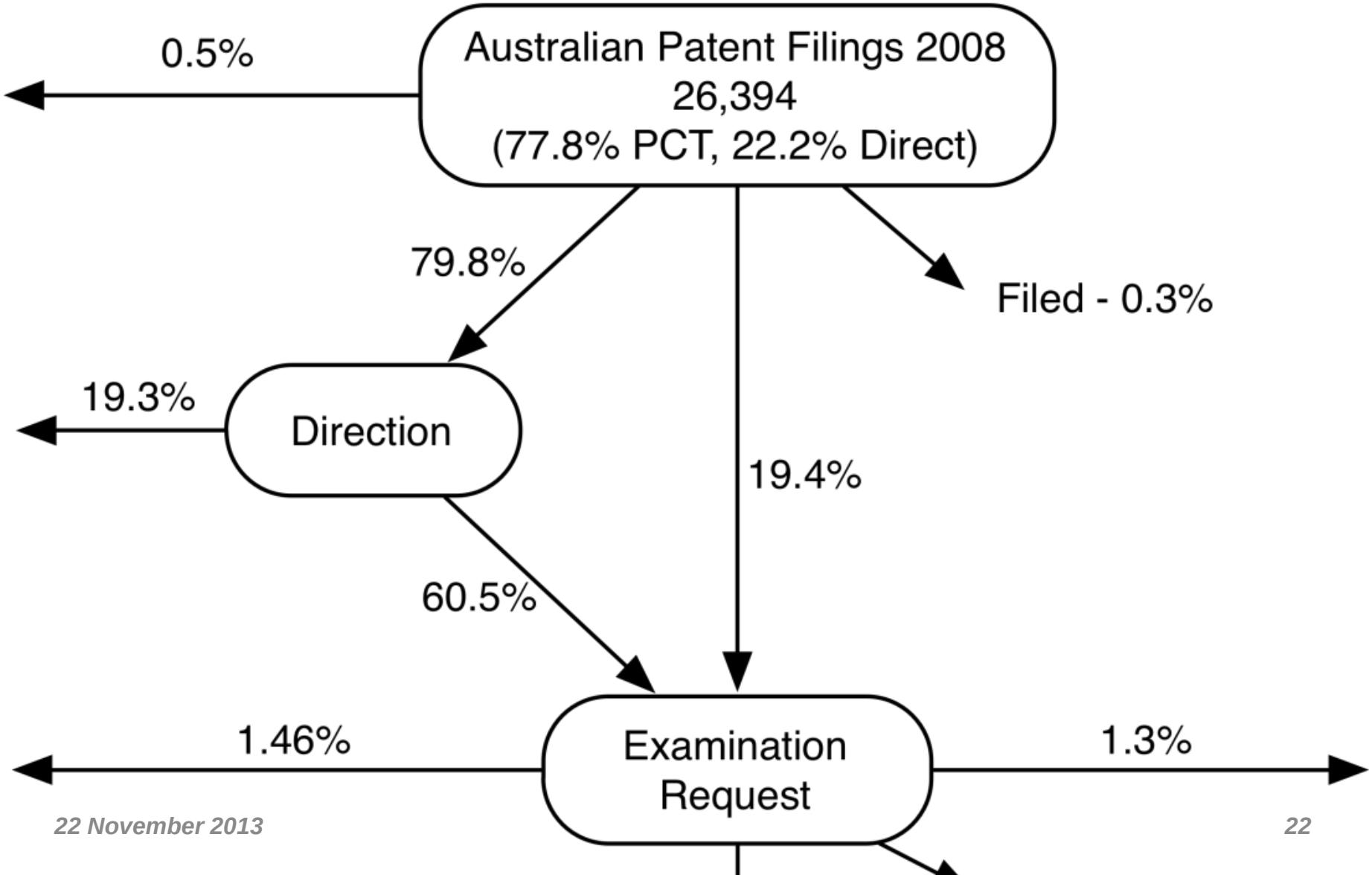
Results: Direction matters



Results: As do

Examiners & Work Sharing (PPH)

Key insights from the UK

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Economics, Research & Evidence

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Stocks and expected pendency time

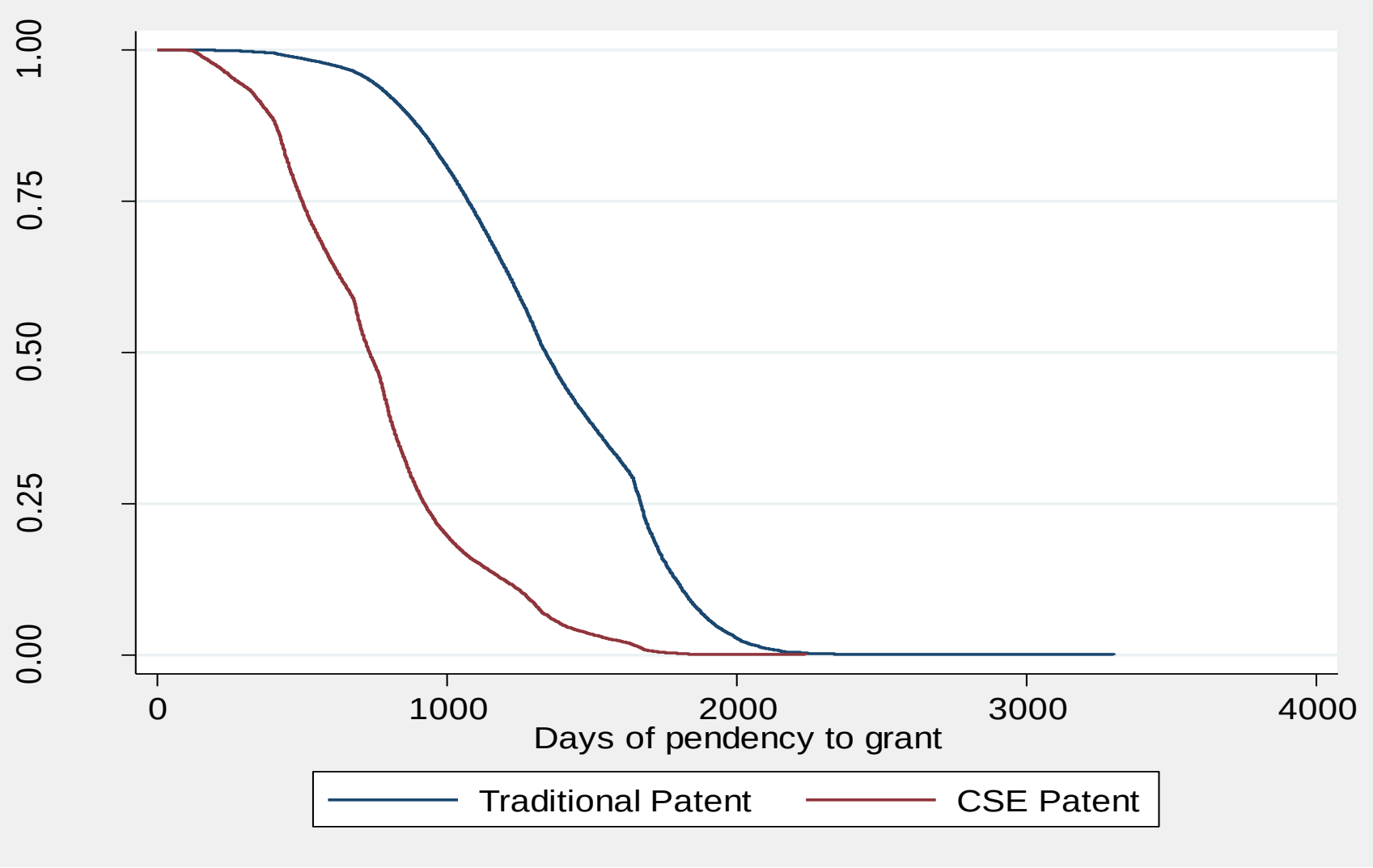
Experiment – If application stocks double, what happens to expected pendency time?

	% from baseline	*Extra months*
S1inside	***34%***	***7***
S2inside	***8%***	***2***
S2outside	***100%***	***21***
S3inside	***3%***	***0.5***
S3outside	***-6%***	***-1***

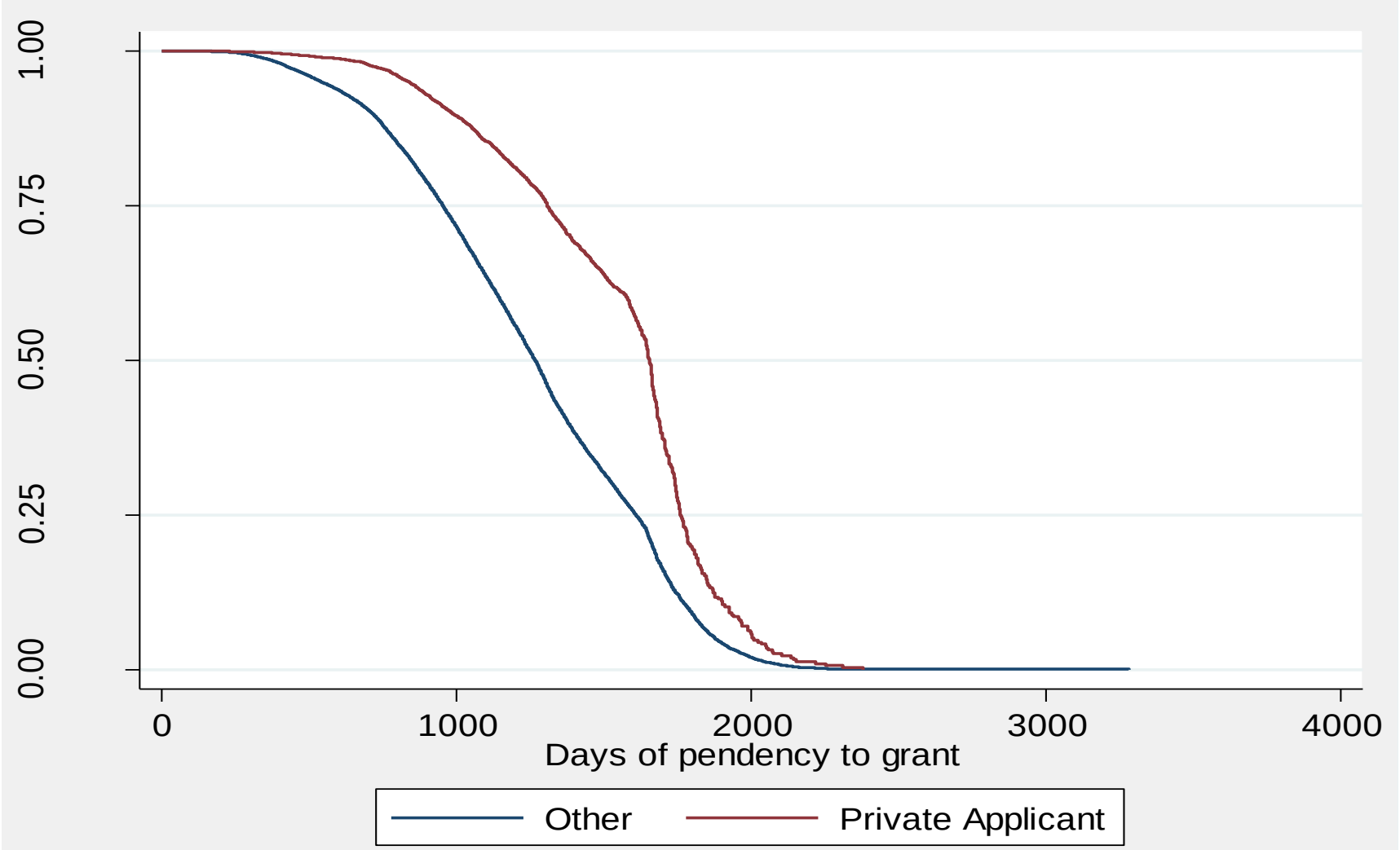
What else drives pendency?

- Examination capacity → Pendency is quite responsive to this
- Applicant requests for additional work → Slows pendency time to grant
- Deadlines on amendment requests → Increase the backlog in Stock 3
- Patent complexity (TAF) → Inconclusive findings

CSE applications grant faster



Private applicants are slower



Key insights from the US

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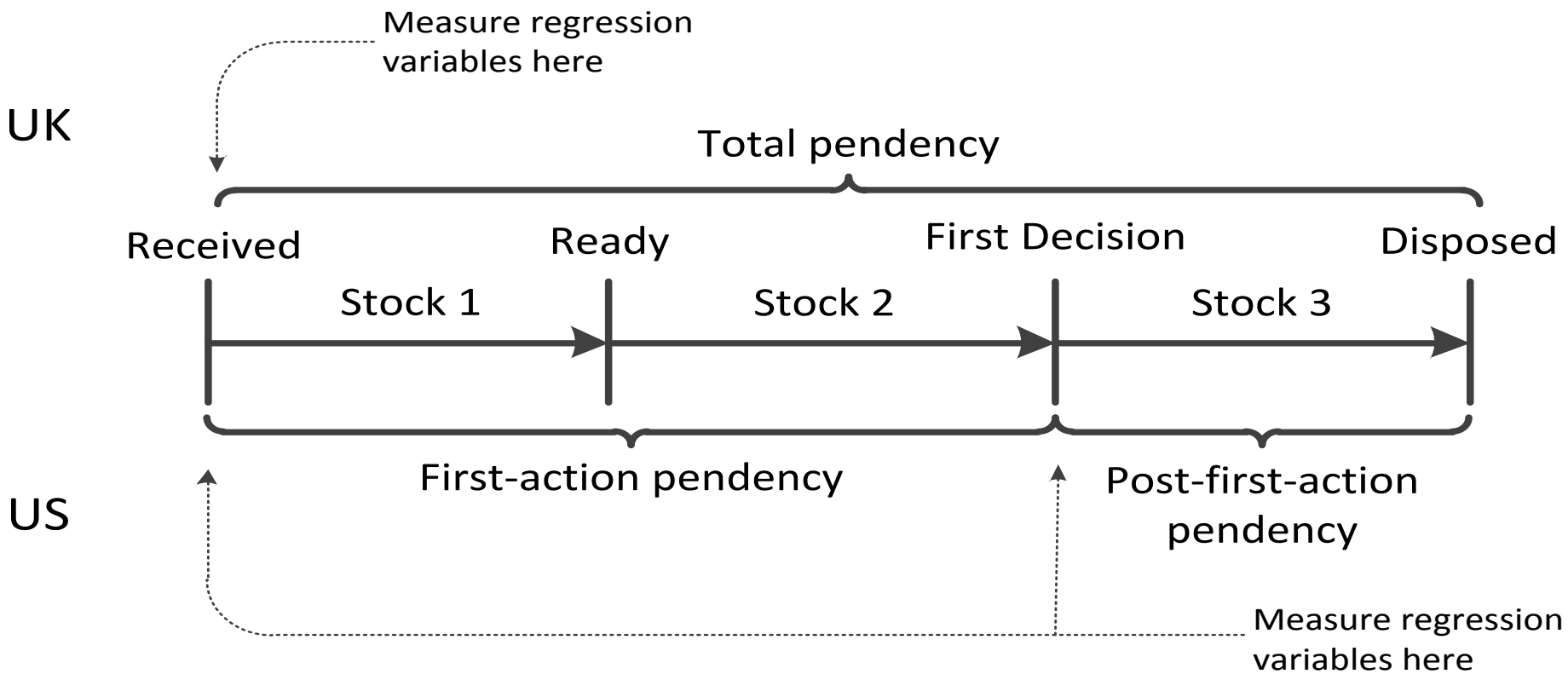
Survival analysis recap



Regression Variables

Environmental variables: Application stocks, Number of examiners

Application characteristics: Claims, technology, priority status, small/large entity

Results: First action pendency

One additional junior examiner →

- 1191 seconds faster (per incoming application)
- 173 months in reduced delay (across all incoming applications in a year)
- This would cost $600/month at average examiner salary

One additional unexamined application →

- 39 seconds of delay (per incoming application)
- 5.7 months of delay (across all incoming application in a year)
- This would cost $3420 to mitigate (@ $600/mo)

One additional RCE →

- 65 seconds of delay (per incoming application)
- 9.4 months of delay (across all incoming applications in a year)
- This would cost $5640 to mitigate (@ $600/mo)

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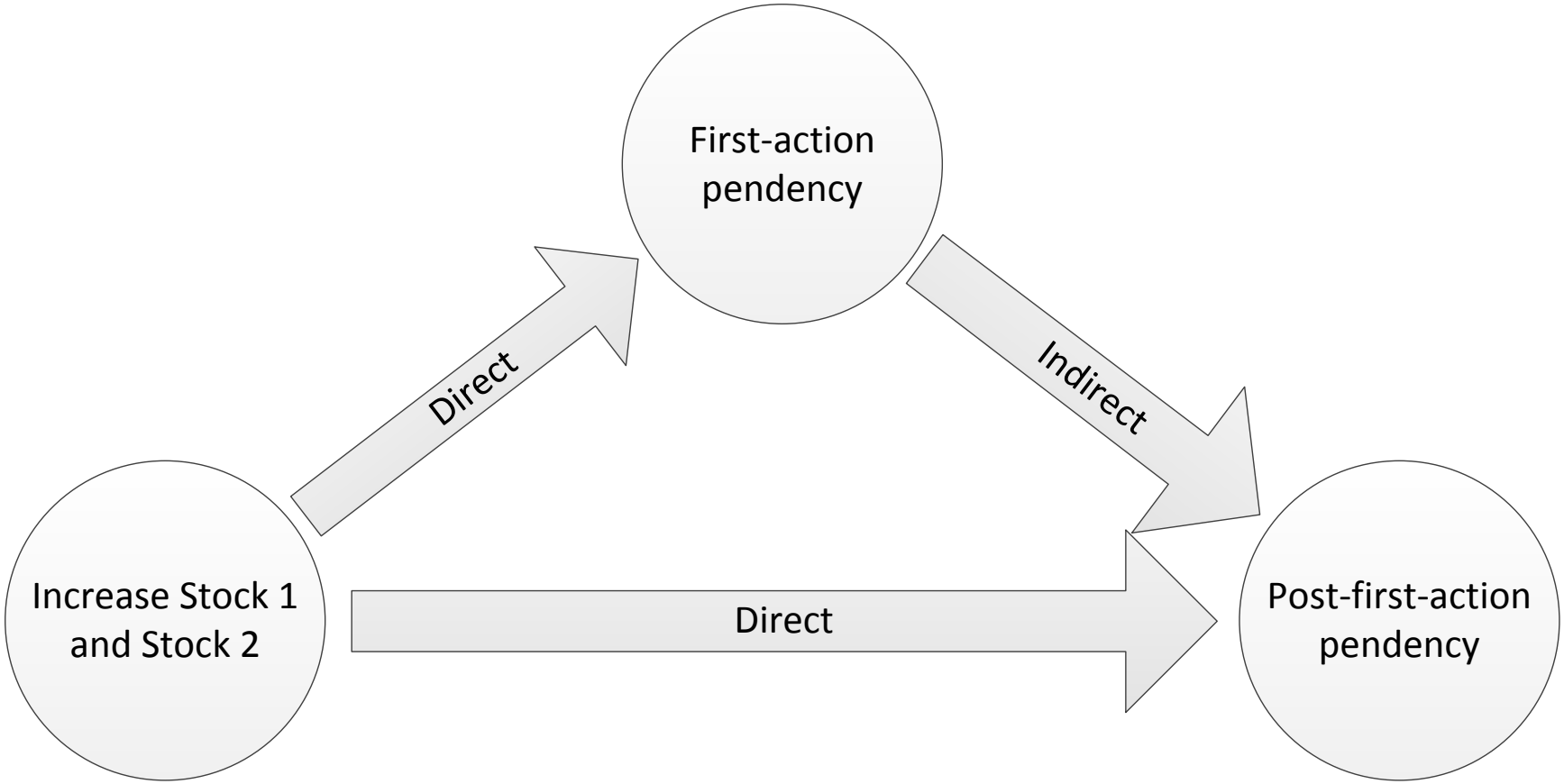
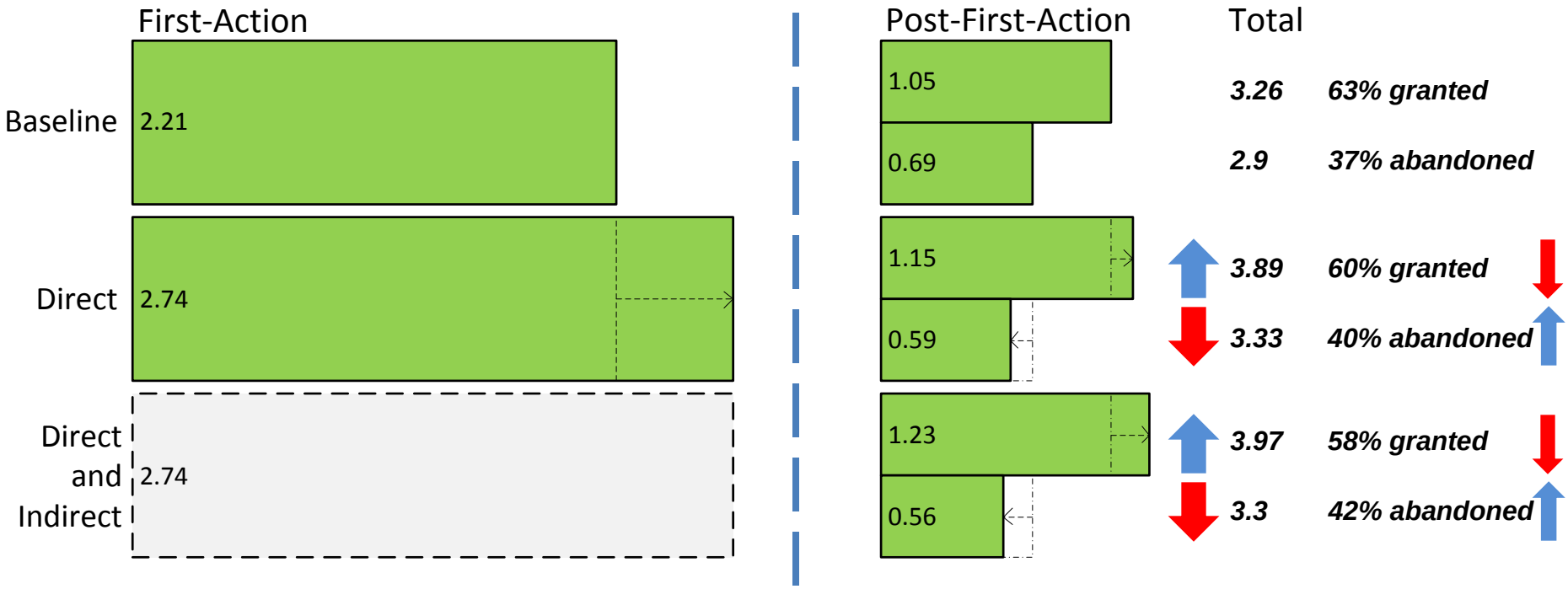
Results: total pendency



Experiment: Increase application stocks

Impact on pendency from a 50% increase in unexamined applications



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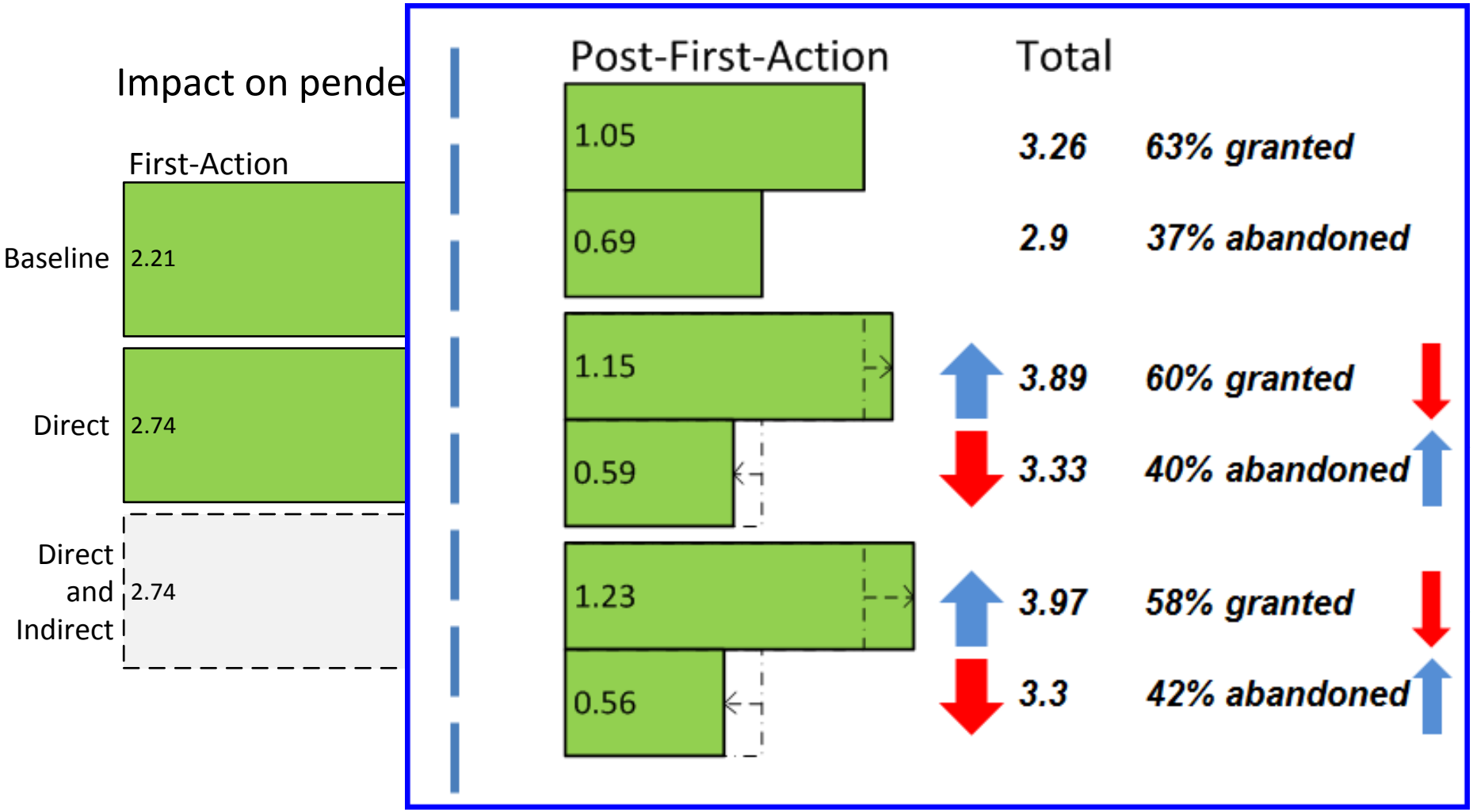

Conclusion

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Lessons learned

- In all three offices workload per application has increased, extended prosecution (US), application amendments (UK) and delayed exam requests (AUS) affect pendency

Balancing policy concerns

- Fees, costs, workload, pendency, examination quality

Going forward

- The results from the UK, US and Oz analyses serve as examples of how policy-makers can identify contributors to pendency