



Australian Inventors: Who Are They?

Alfons Palangkaraya

IPRIA & IPTA Seminar

Melbourne 24 June 2010



Outline

- Background
- Data sources
- Inventor characteristics
- Inventor's legal concerns (infringement)
- Inventor mobility
- Concluding remarks



Background

- Patent data have been used extensively to study the determinants and impacts of innovative activities, technology transfers and knowledge spillovers
 - Patent counts
 - Patent citation analysis
 - Patent licensing
 - Patent examinations
 - Patent validity
- Patent data also provide information regarding the inventors
 - Inventor data provide vast research potential, but not used much yet
 - Sources:
 - Listed inventors at the front page of patent/patent applications
 - Survey of inventors



Research questions

- Who are Australian inventors?
 - Demography?
 - Mobility?
 - Quality of invention?
 - Productivity?
- What is their commercialisation experience?
 - Legal protection of their invention?
 - Value of legal protection?
- (will cover some of these questions)



Data Sources

- IP Australia Database 1986-2005
 - 31,947 Australian inventors, 31,313 patent applications filed
 - Inventors address
- Melbourne Institute Australian Inventor Survey 2007
 - Mail-out survey to 43,200 inventor-application pairs
 - 47% returned unopened due to address problem
 - 3,736 useable responses from each inventor-application
- NBER Patent Citations Database (Hall et al. 2002)
 - All US Patents, 1975-1999
 - Inventor name and address
 - Assignee name
 - Patent class
 - Number of citations made and received
 - 2.1 million US patents and 1.6 inventors



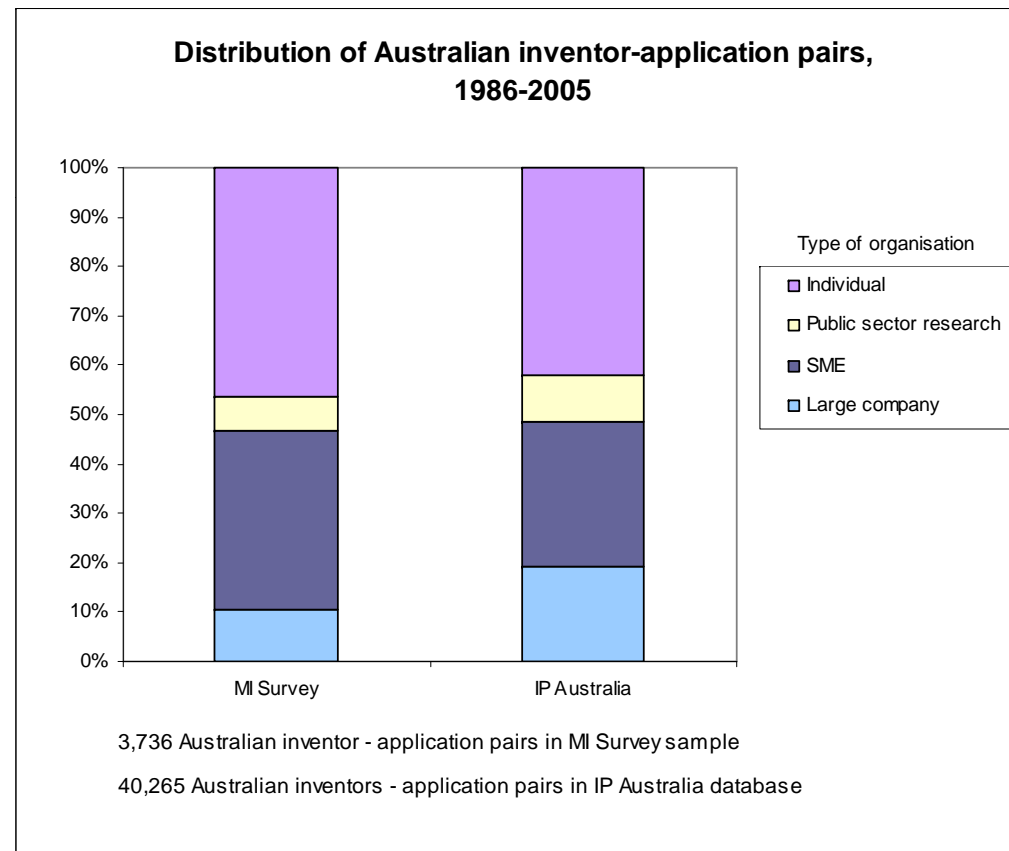
MI Inventor Survey 2007

Relevant questions asked to inventors

- Characteristics
 - What is your age?
 - What is your highest level of qualification?
- Legal protection on invention
 - How do you rate the importance effective protection from copying your inventions (1-7)?
- Legal problems experienced
 - Aware of another party copying the idea behind your patent (or patent application)?
 - Ever sent a legal letter to other parties alleging infringement of your patent?
 - Ever filed court proceedings for alleged infringement of this patent?
 - How severe were the following problems in this development phase? In the Make and Sell phase? And in the Mass Production phase?
 - Lack of confidence in legal protection from copying of the invention
 - Lack of rights to complementary inventions

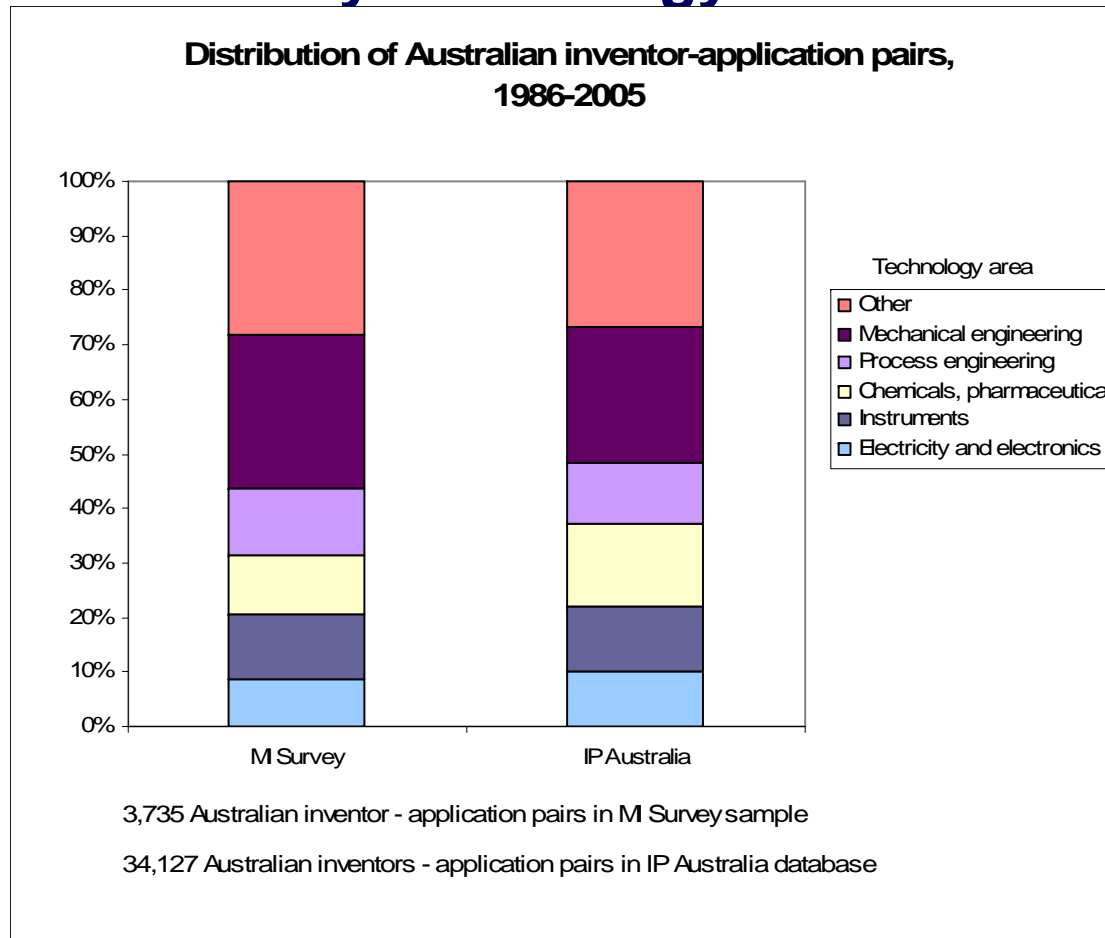


MI Survey's sample distribution by type of assignee



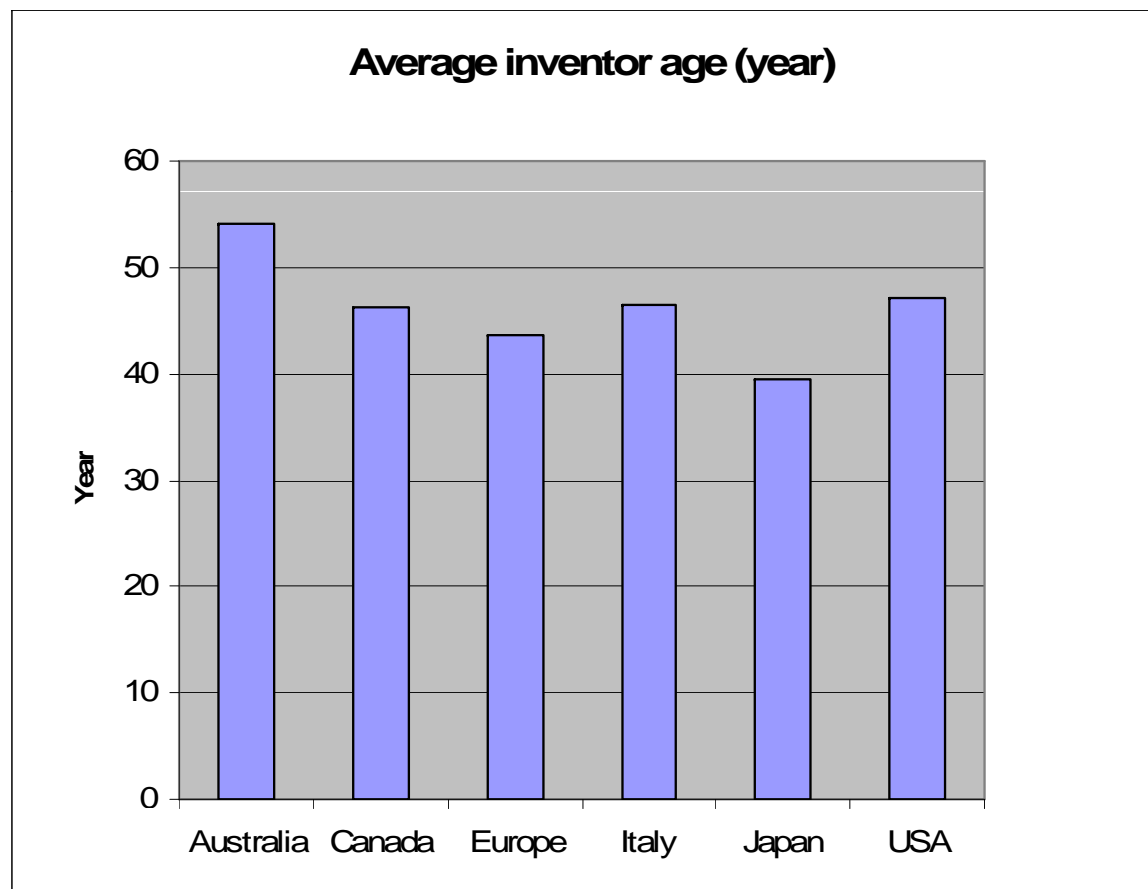


MI Survey's sample distribution by technology area





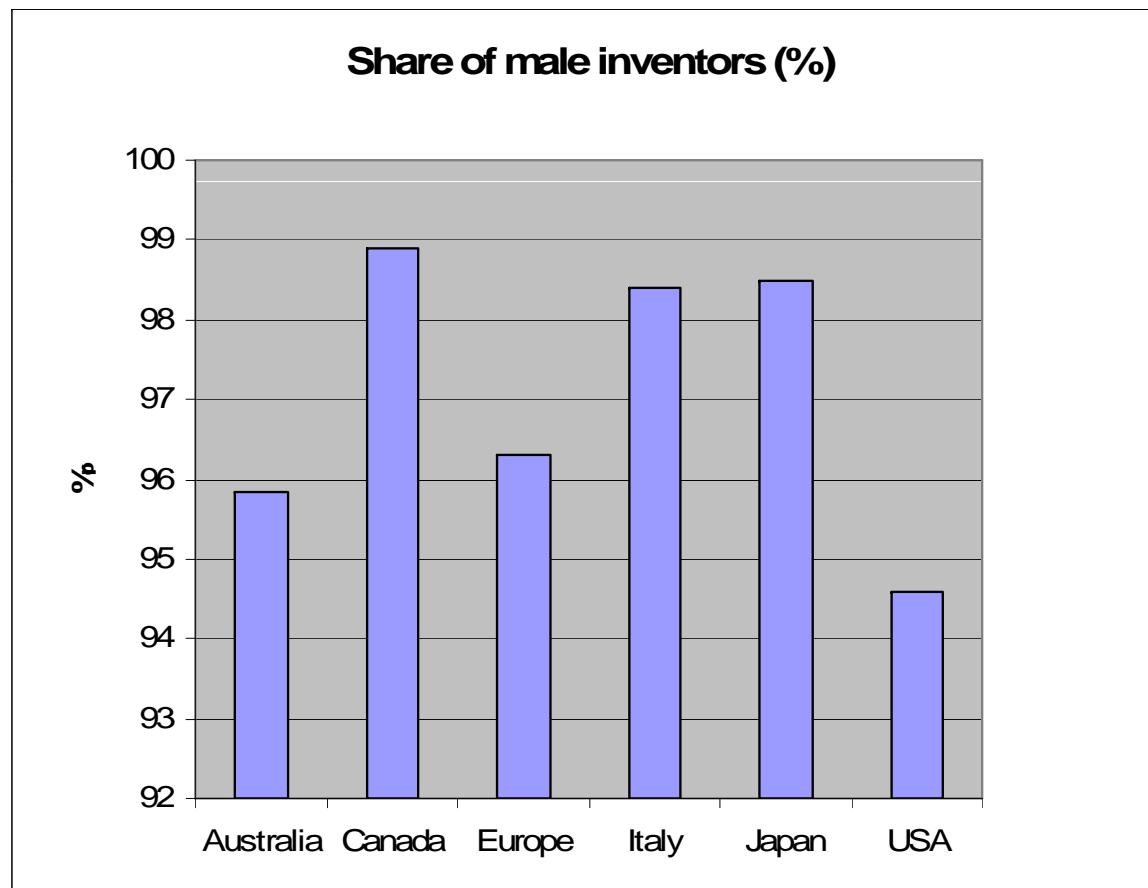
Australian inventors filing in Australia Who are they?





Australian inventors filing in Australia

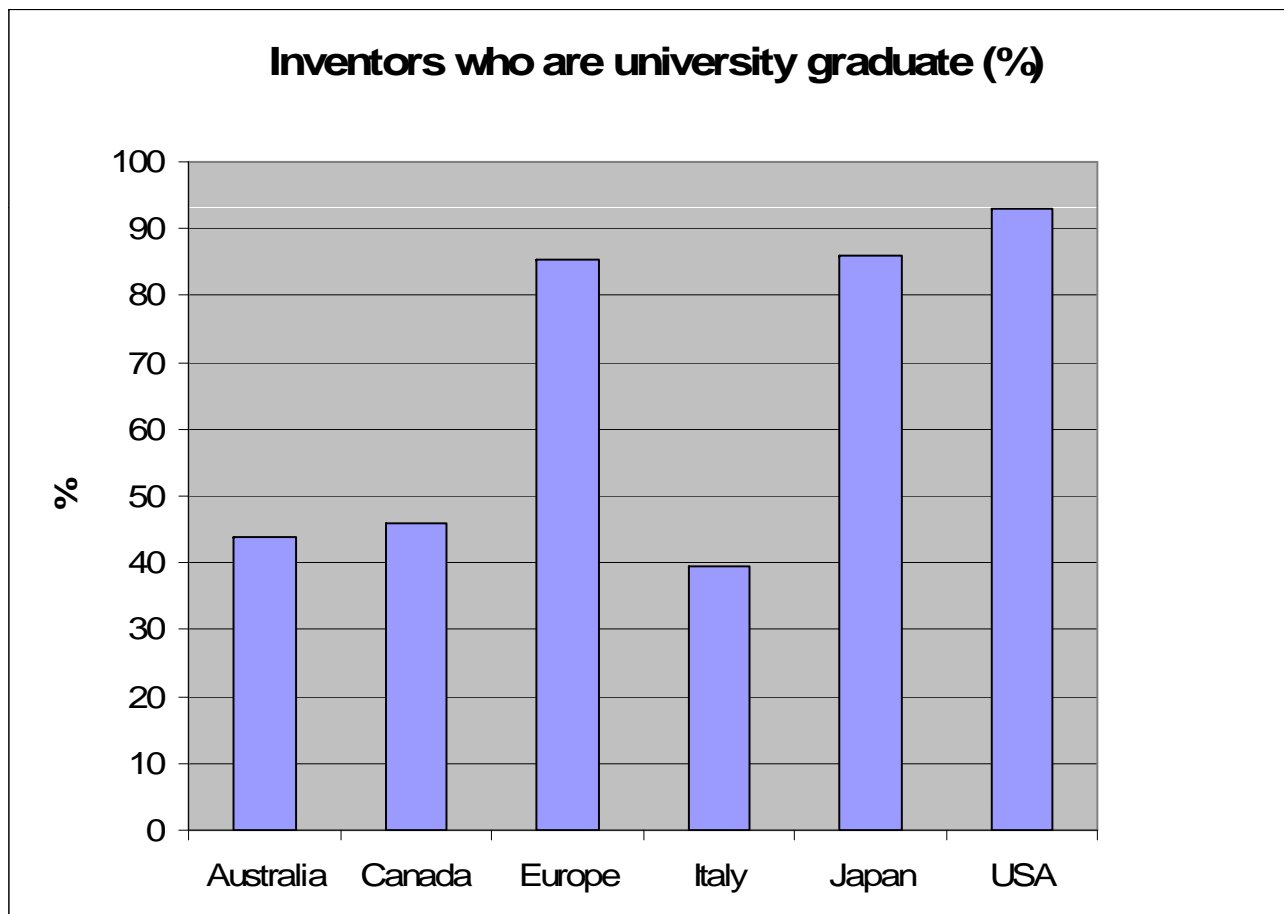
Who are they?





Australian inventors filing in Australia

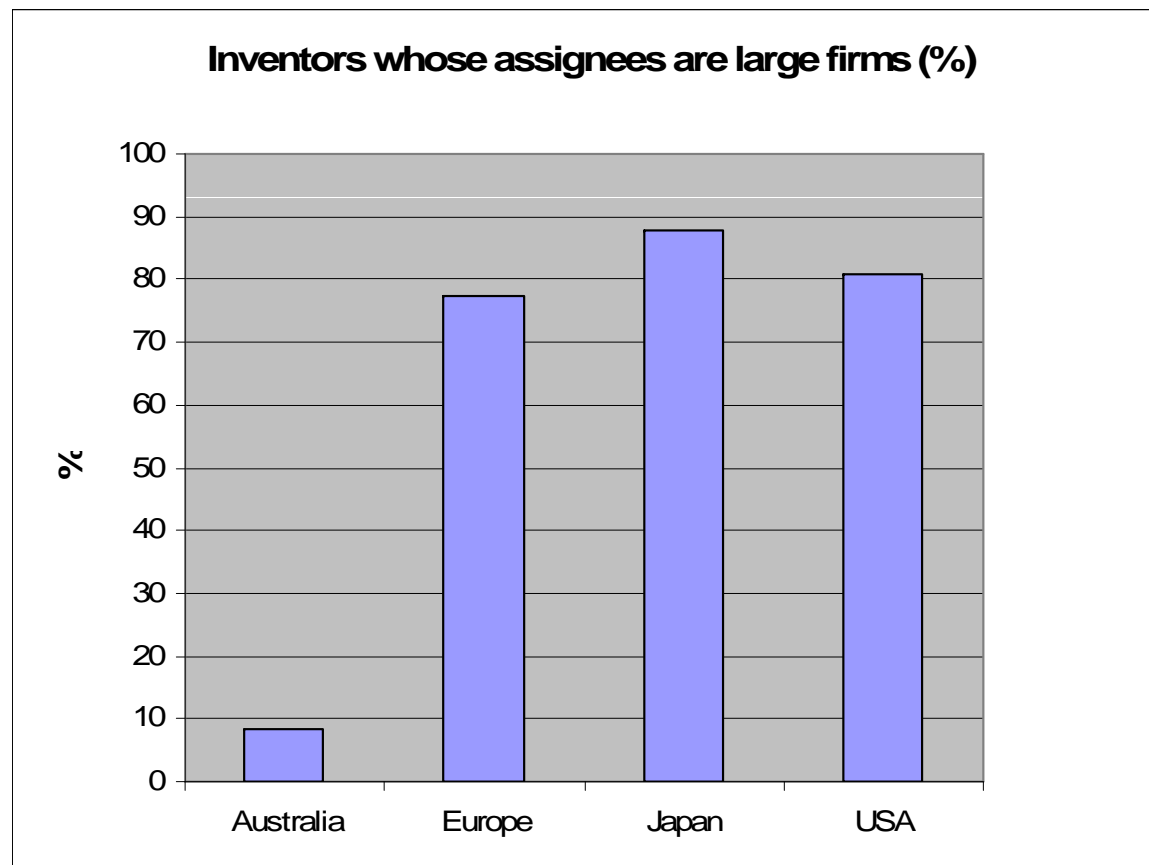
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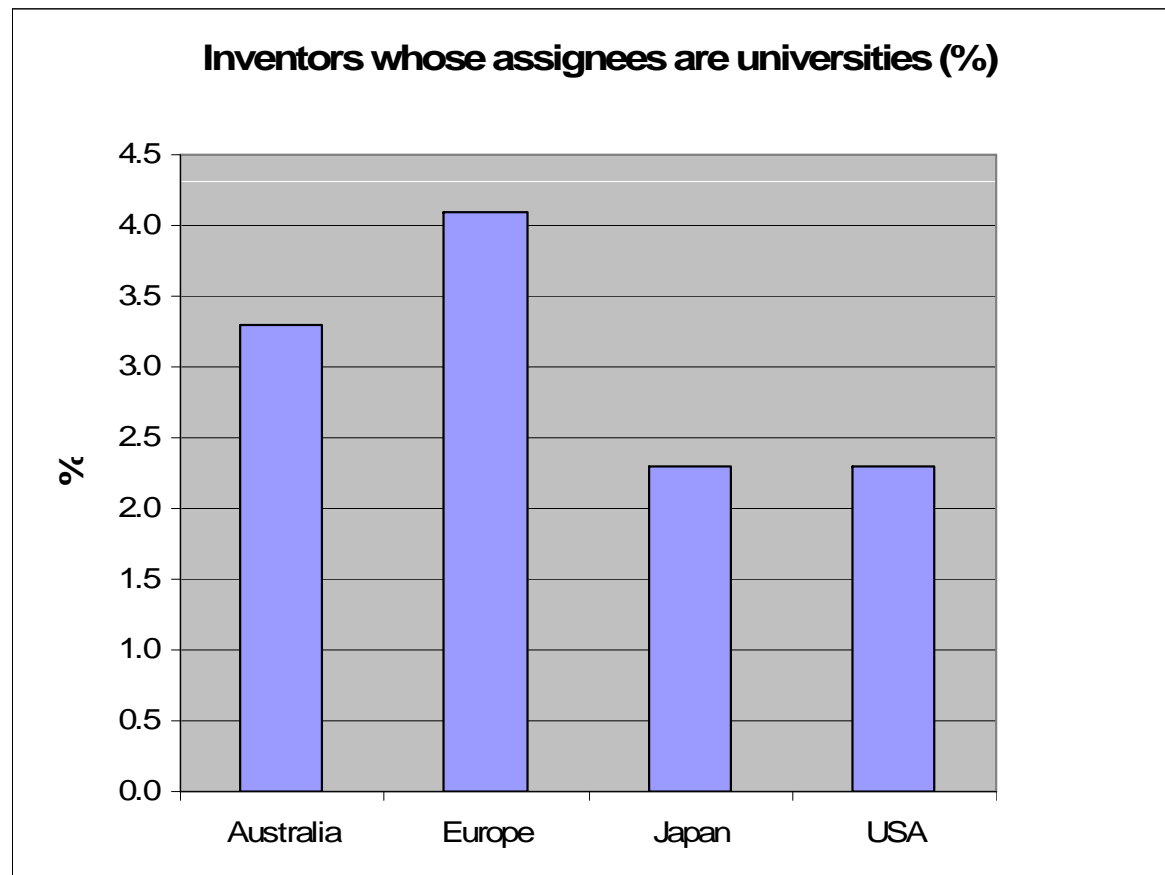
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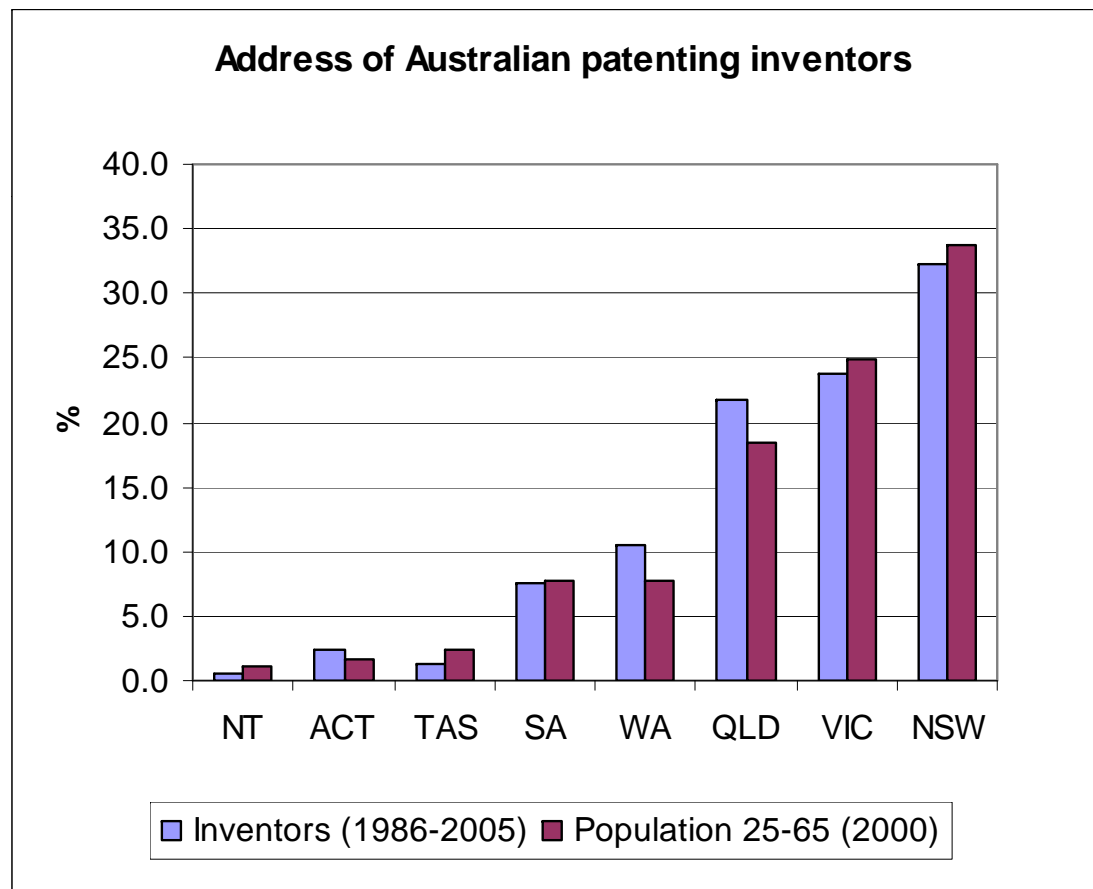
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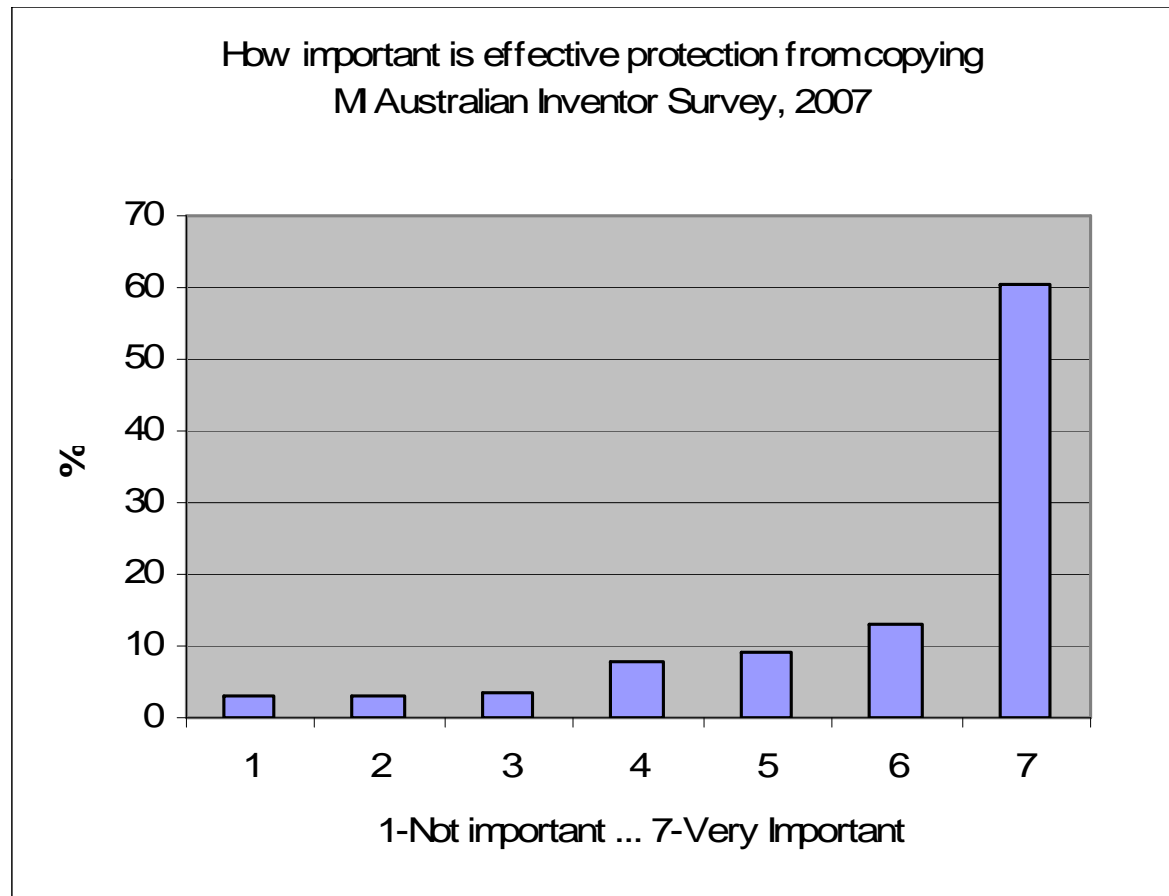


Legal issues

- Main reference: Weatherall & Webster 2009 (Patent infringement in Australia: Results from a survey) available at IPRIA website.

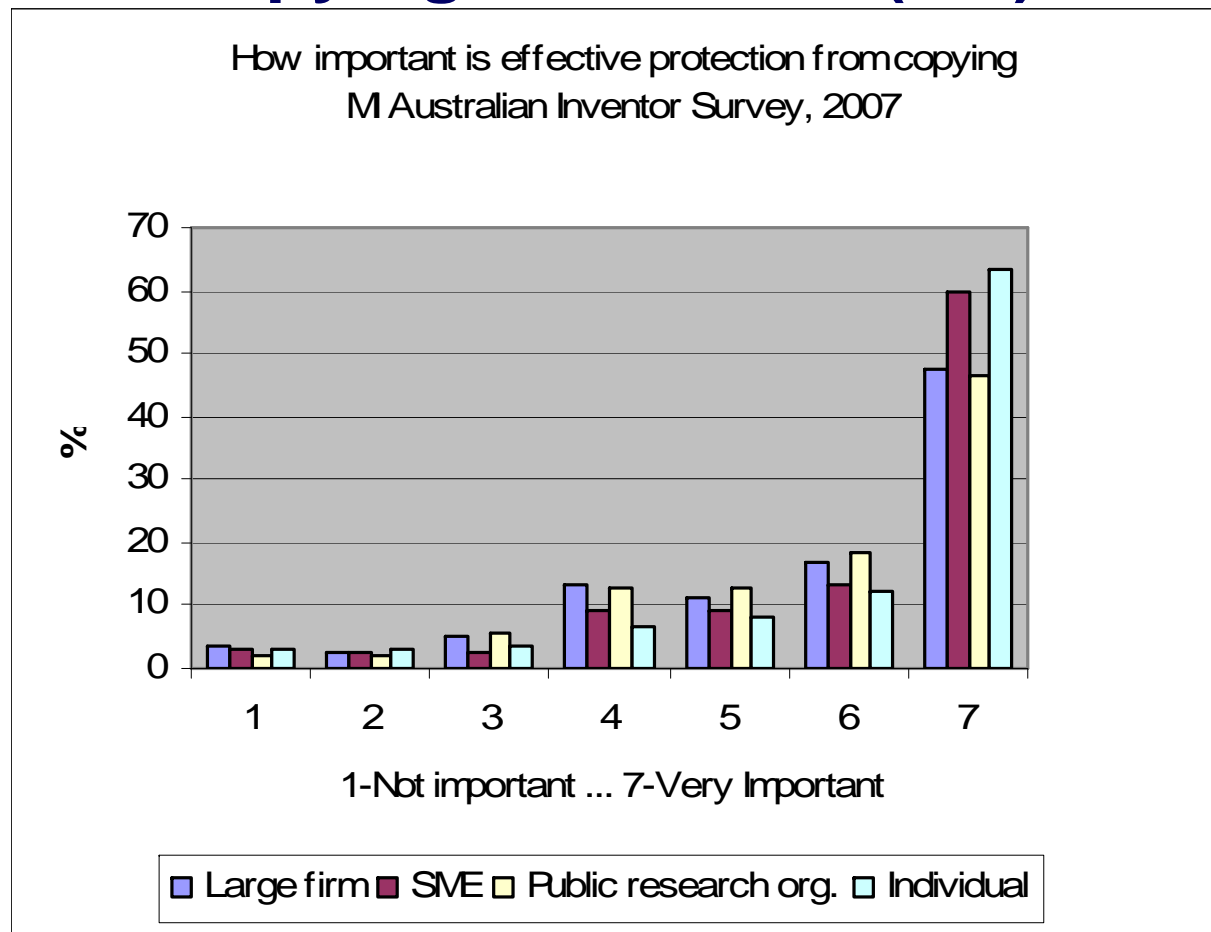


The importance effective protection from copying inventions (1-7)?



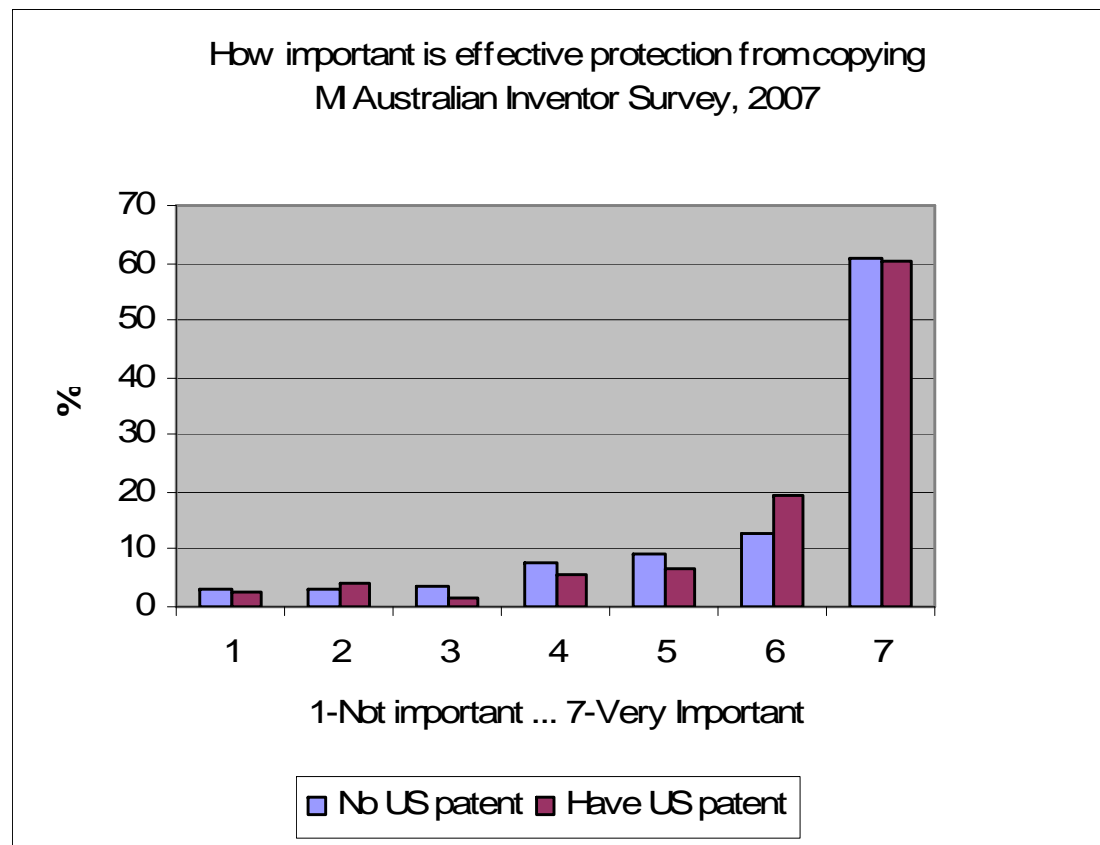


The importance effective protection from copying inventions (1-7)?



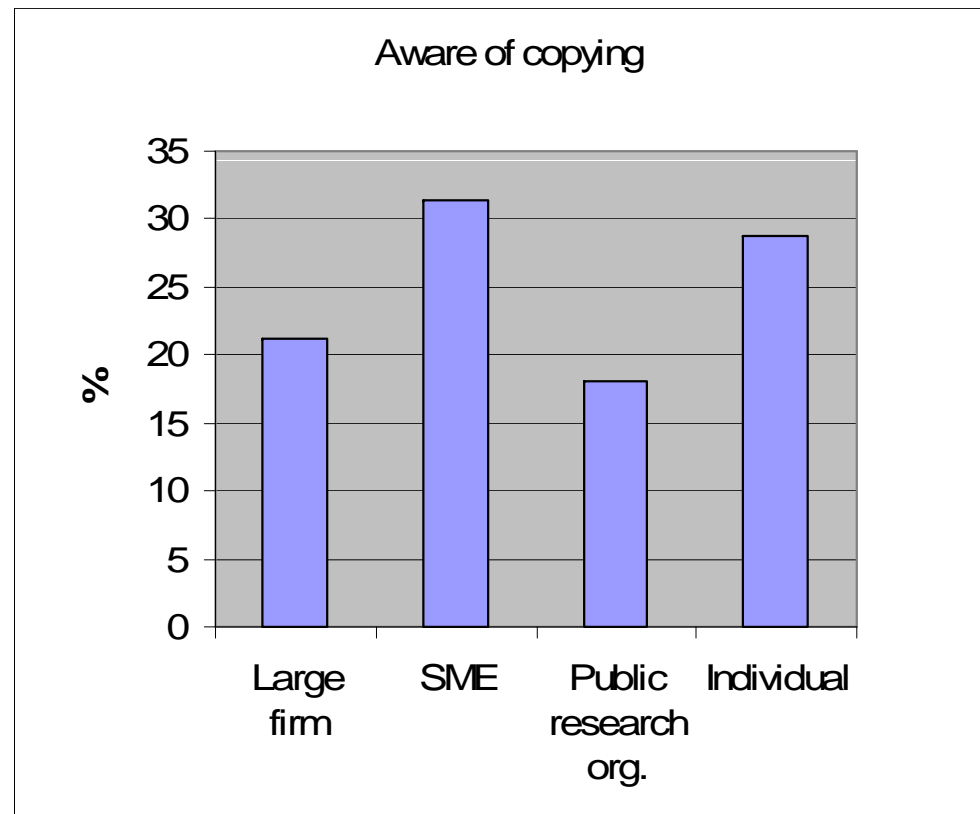


The importance effective protection from copying inventions (1-7)?



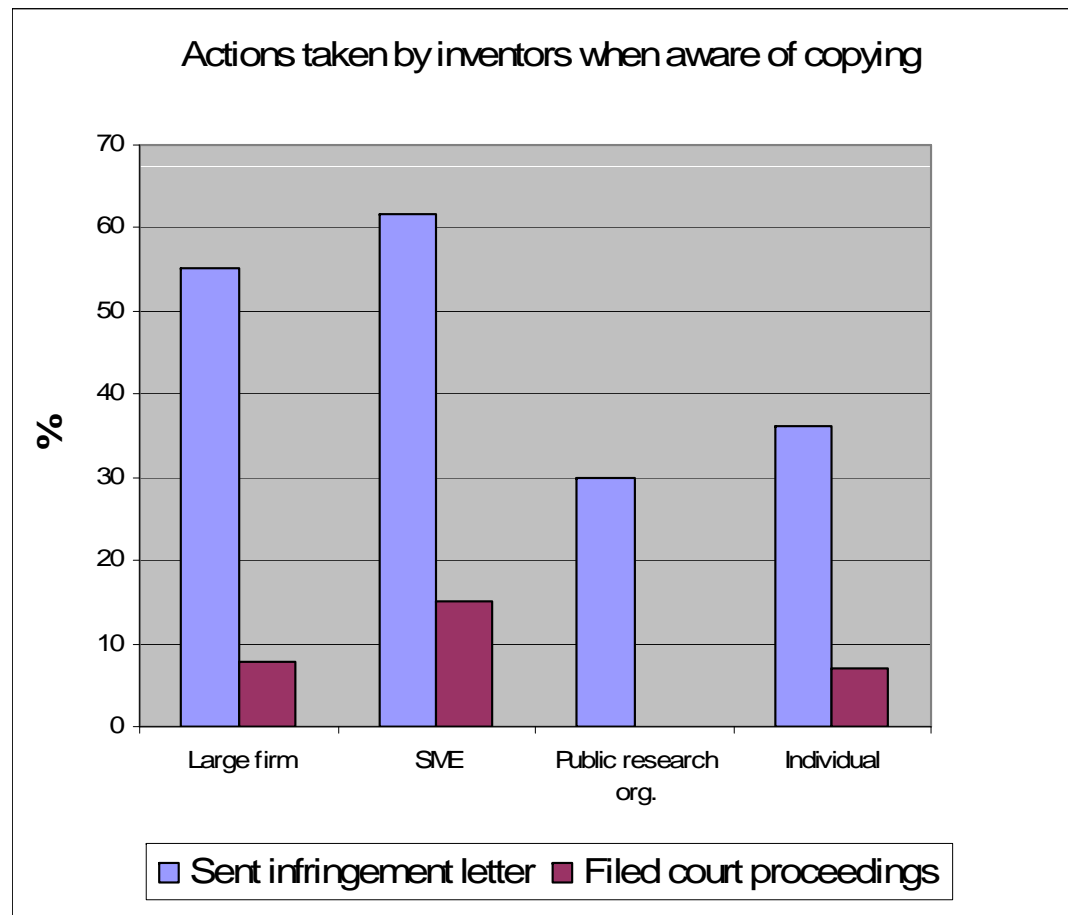


Ever been aware of another party copying the idea behind your patent (or patent application)?



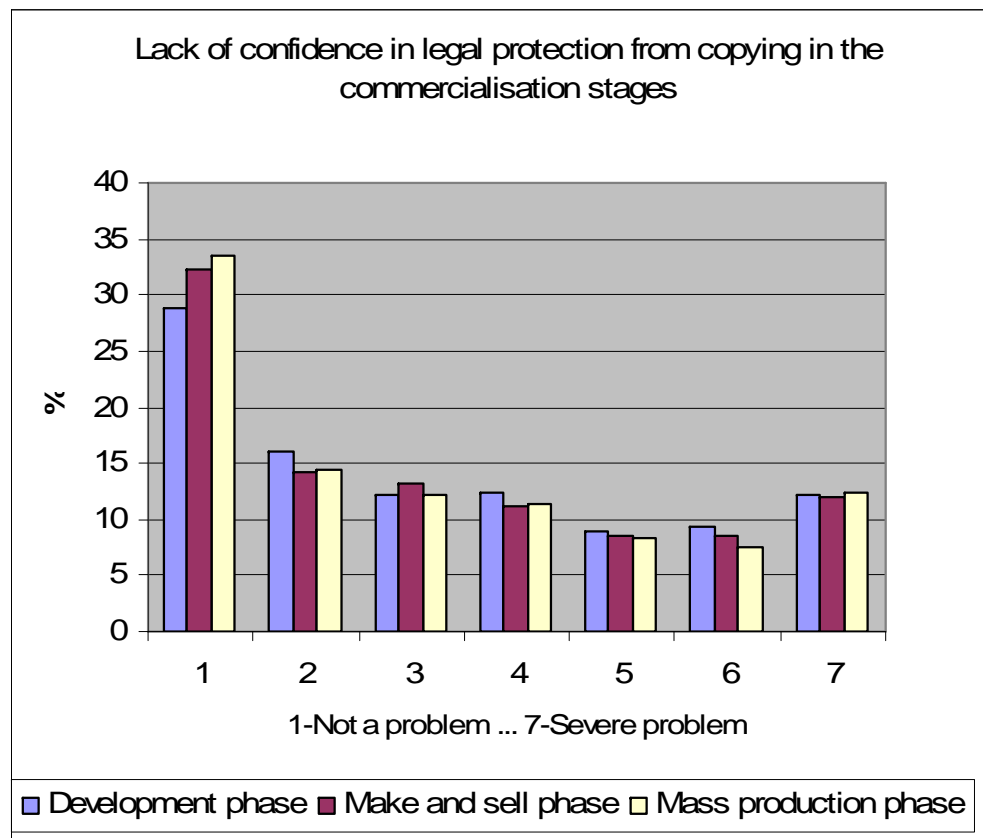


If you are aware of another party copying the idea behind your patent, what have you ever done?





Is lack of confidence in legal protection from copying of the invention a severe problem in the commercialisation stage?





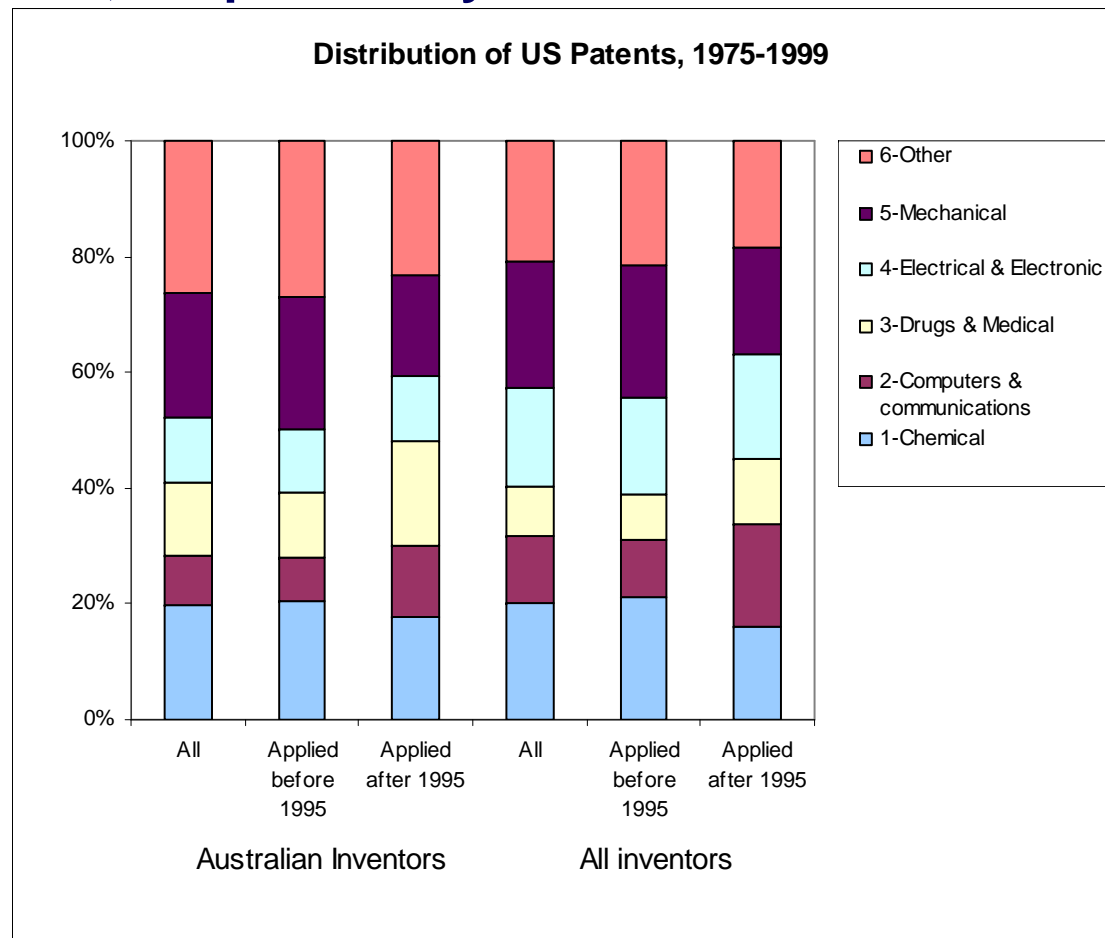
Australian inventors filing in the United States – Who are they?

- US Patents granted in 1975-1999
- 9,676 listed Australian inventors
 - AU country code in inventor's address
- 17,002 US Patents with at least one Australian inventors
- 2.3 US patents per Australian inventors



2.1 Million US patents, 1975-1999

17,002 patents by Australian inventors





US Patents 1975-1999

Select top Australian inventors' assignees

Problem: Missing assignee names

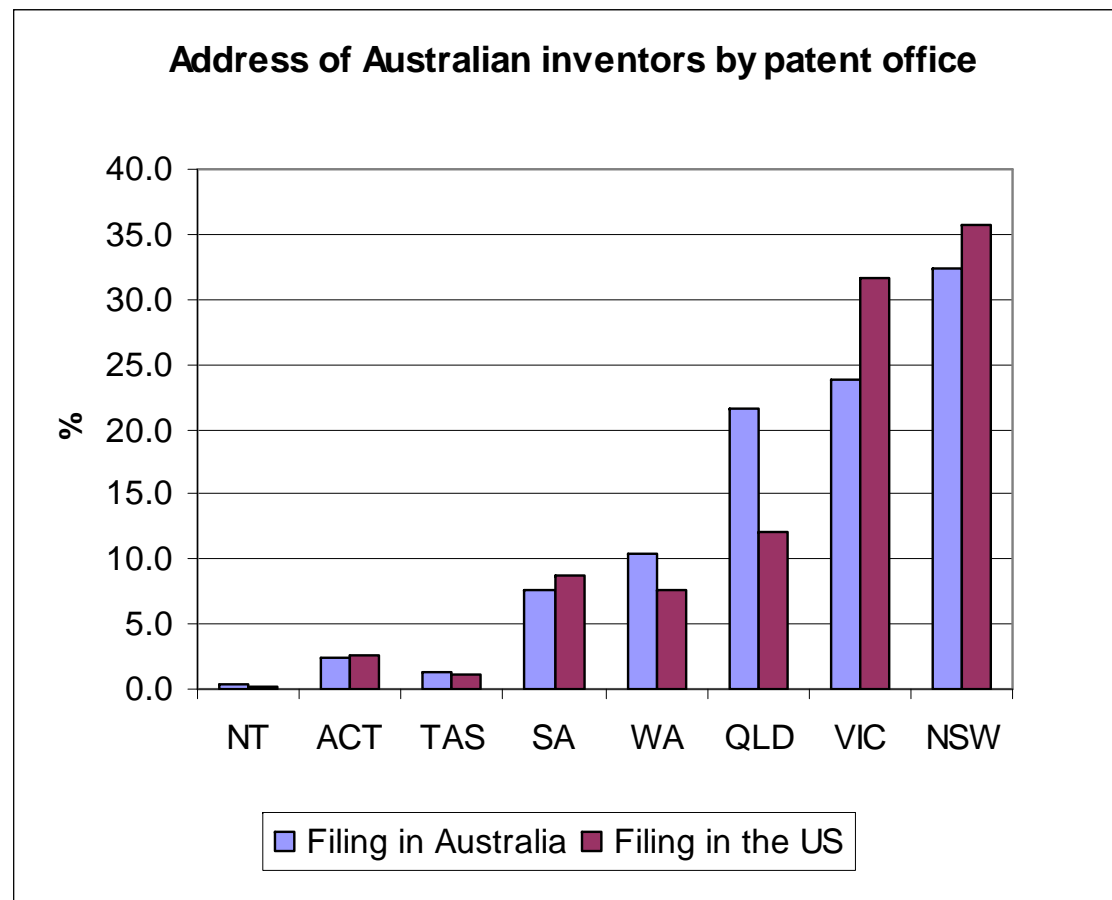
Assignee name	Number of patents
International Business Machine Corp	116
Advanced Micro Devices Inc	112
Eastman Kodak Co	108
Motorola Inc	74
General Electric Co	64
Xerox Corp	53
Texas Instrument Inc	49
US Philips Corp	46





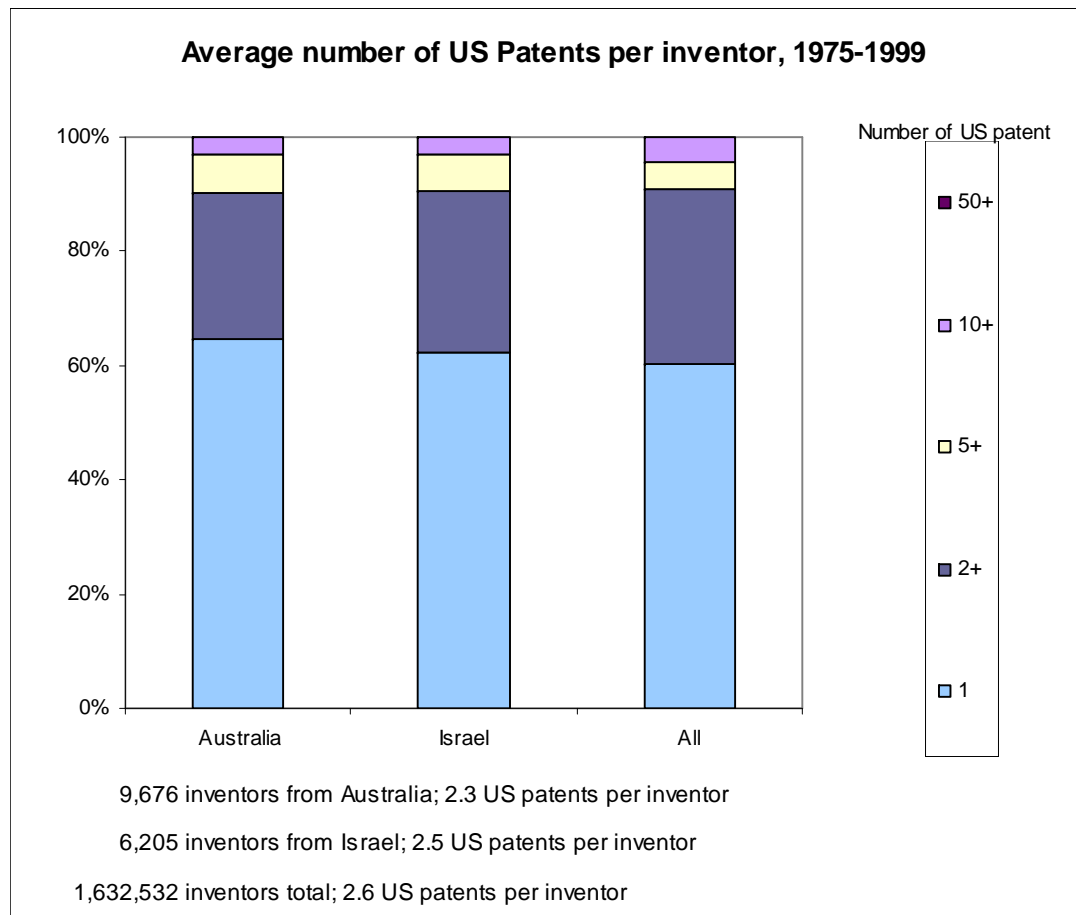
Australian inventors filing in the US

Who are they?



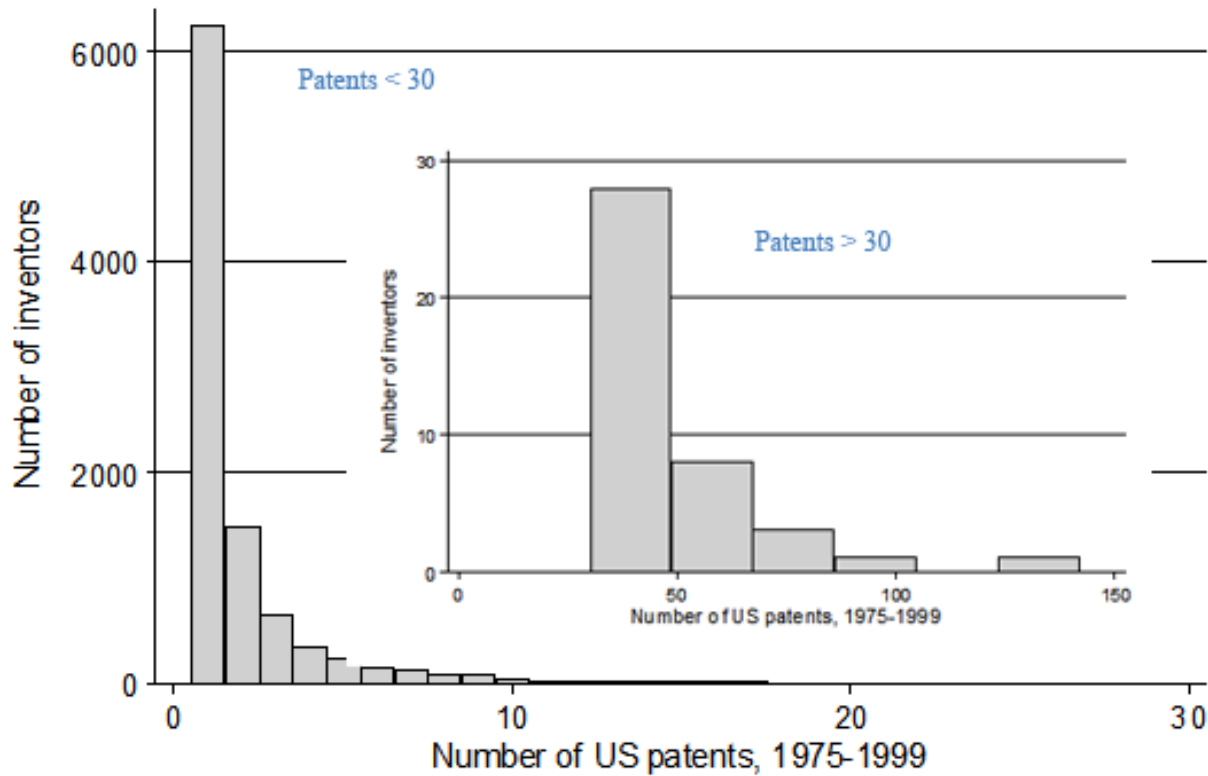


Inventor 'productivity' Australia, Israel and the world





Number of US Patents per AU inventors





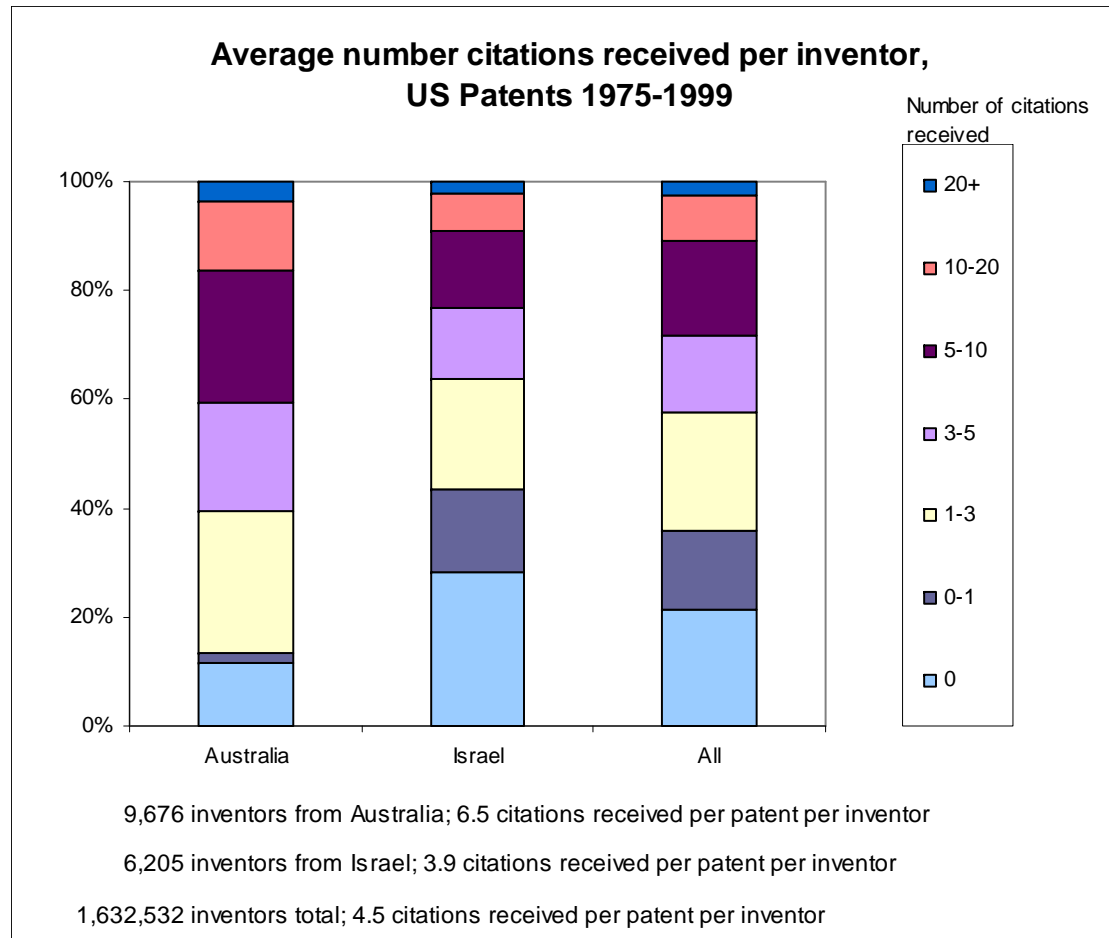
Patent 'Quality' measure

Forward citation i.e. citations received

- Number of citation received recorded by USPTO
- Measure technological value (or inventive step)
 - US patent examiners are 'not called upon to cite all references that are available, but only the best'
 - Carpenter et al (1981):
 - IR-100 award: 100 Most Technologically Significant New Products & Processes of the Year
 - IR-100 award patents received twice as many citations as 102 randomly selected patents
 - Breitzman and Narin (1996)
 - Patents listed in the National Inventors' Hall of Fame, Historical Significance list, Pioneering Patent list are cited 7, 6 and 2.5 times more than average.



Invention 'quality' Australia, Israel and the world



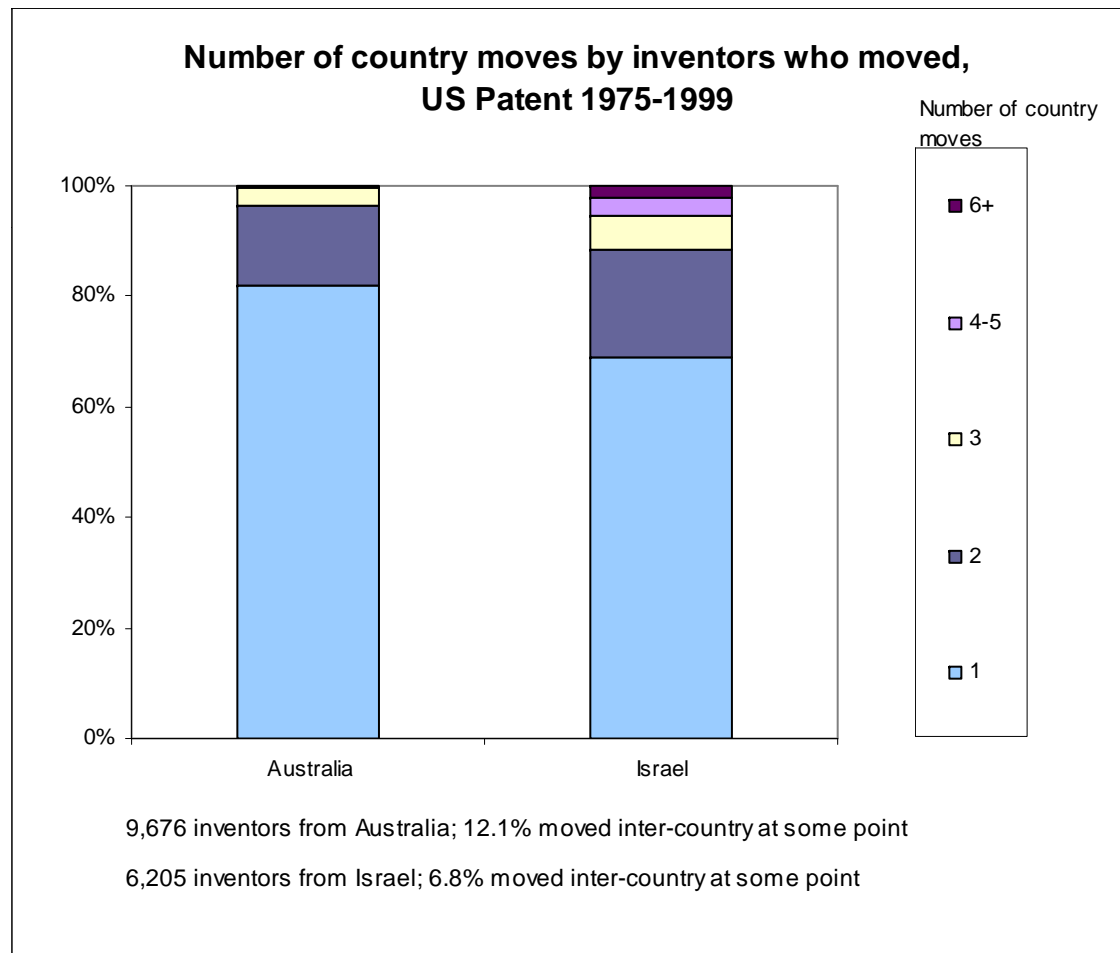


Inventor Mobility

- Geographic mobility
 - Across countries
 - Across states
 - Across cities/suburbs
- Institutional
 - Across assignees
- Note: Need to look at those inventors with at least 2 US Patents.

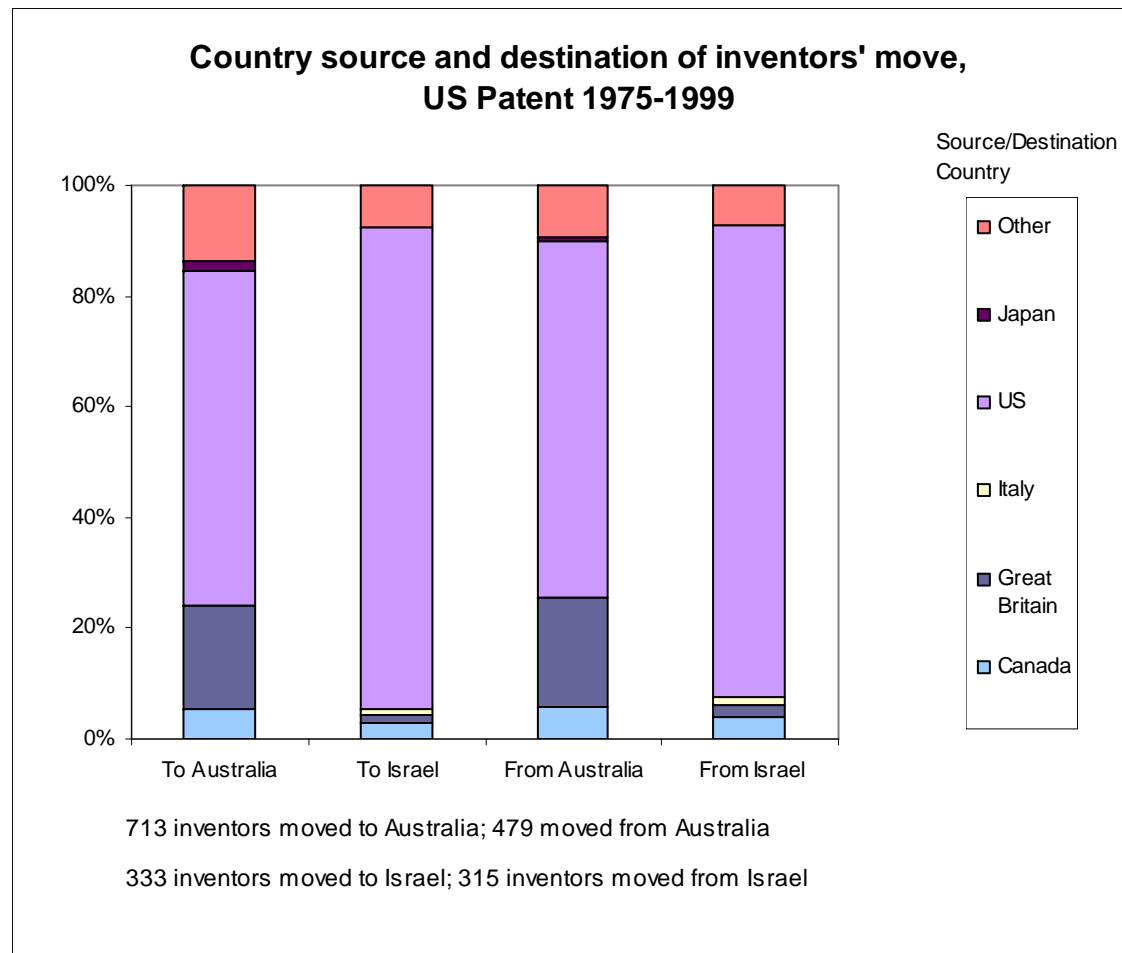


Inventor Mobility Across Countries





Source and destination countries





Effects of mobility on invention quality

- Regression analysis
- Only shows correlation instead of causality
- Model: Quality of patent = f(mobility, other control variables) + random error
- Quality is measured by citation received
- Mobility:
 - Geographic
 - Institutional
- Hypothesis: Mobility is positively correlated invention quality





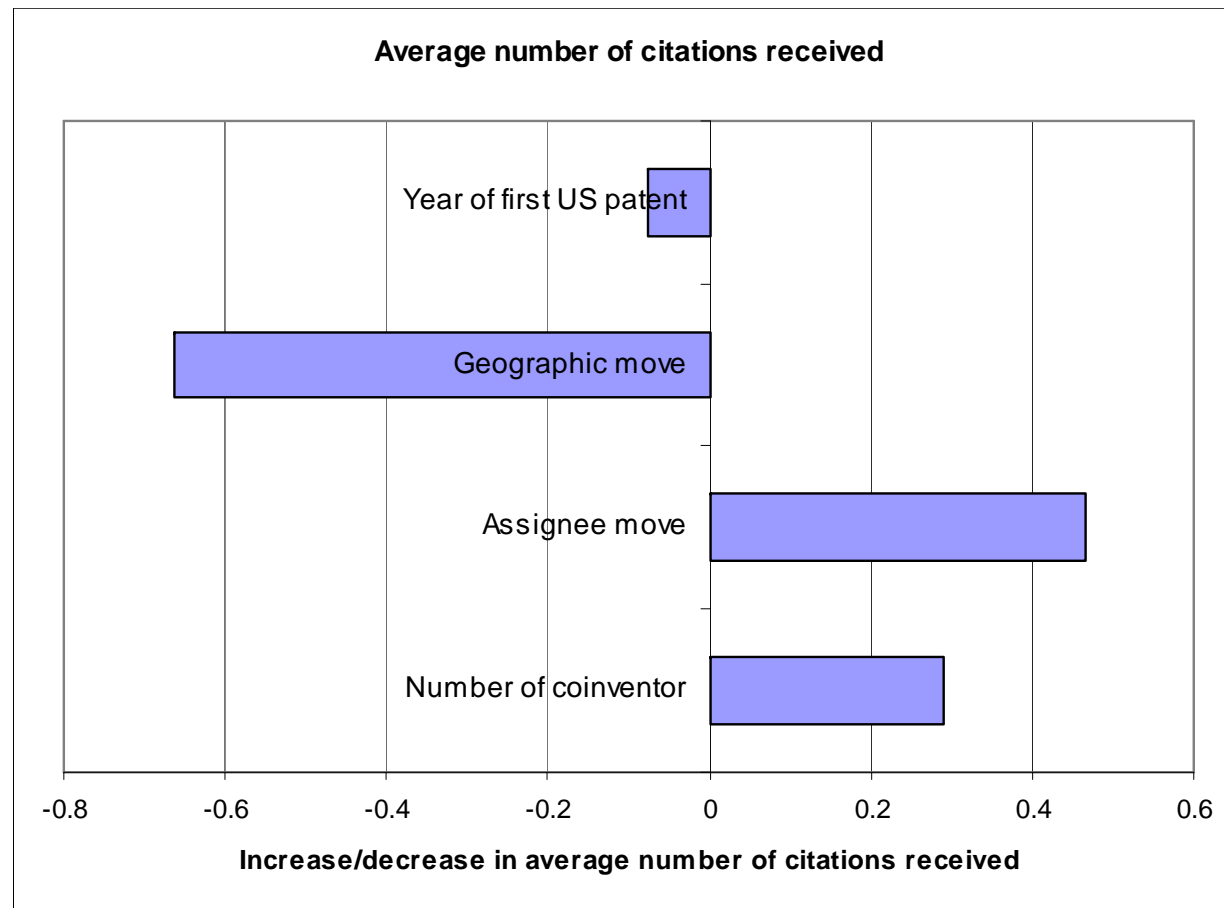
Control variables (Trajtenberg & Shiff 2008)

Variable	Control for
Assignee move	Whether or not moved institutionally
Geographic move	Whether or not moved geographically
Application year	Time effect
Partners	Number of co-inventors
Past cite-received	Quality of past inventions
Number of prior assignee moves	Past geographic mobility
Number of prior geographical moves	Past institutional mobility
Patent sequence	Inventor career point
First year (year of 1 st US patent)	Inventor experience
Technology dummy variables	Technology variation in citation





Effects of inventor mobility on patent quality



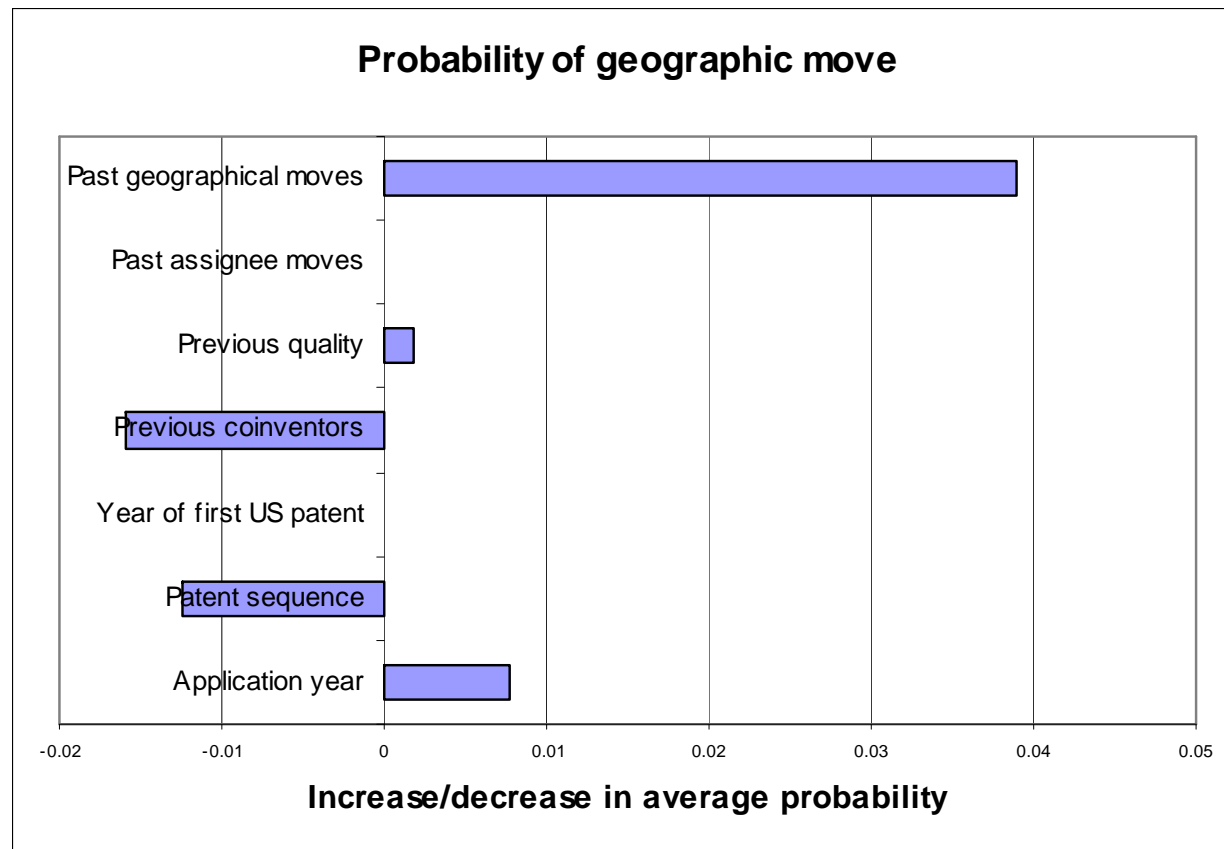


Determinants of inventor mobility

- Regression analysis
- Mobility:
 - Probability of a geographic move
 - Probability of an institutional move
- Research question: Which inventors are more mobile?

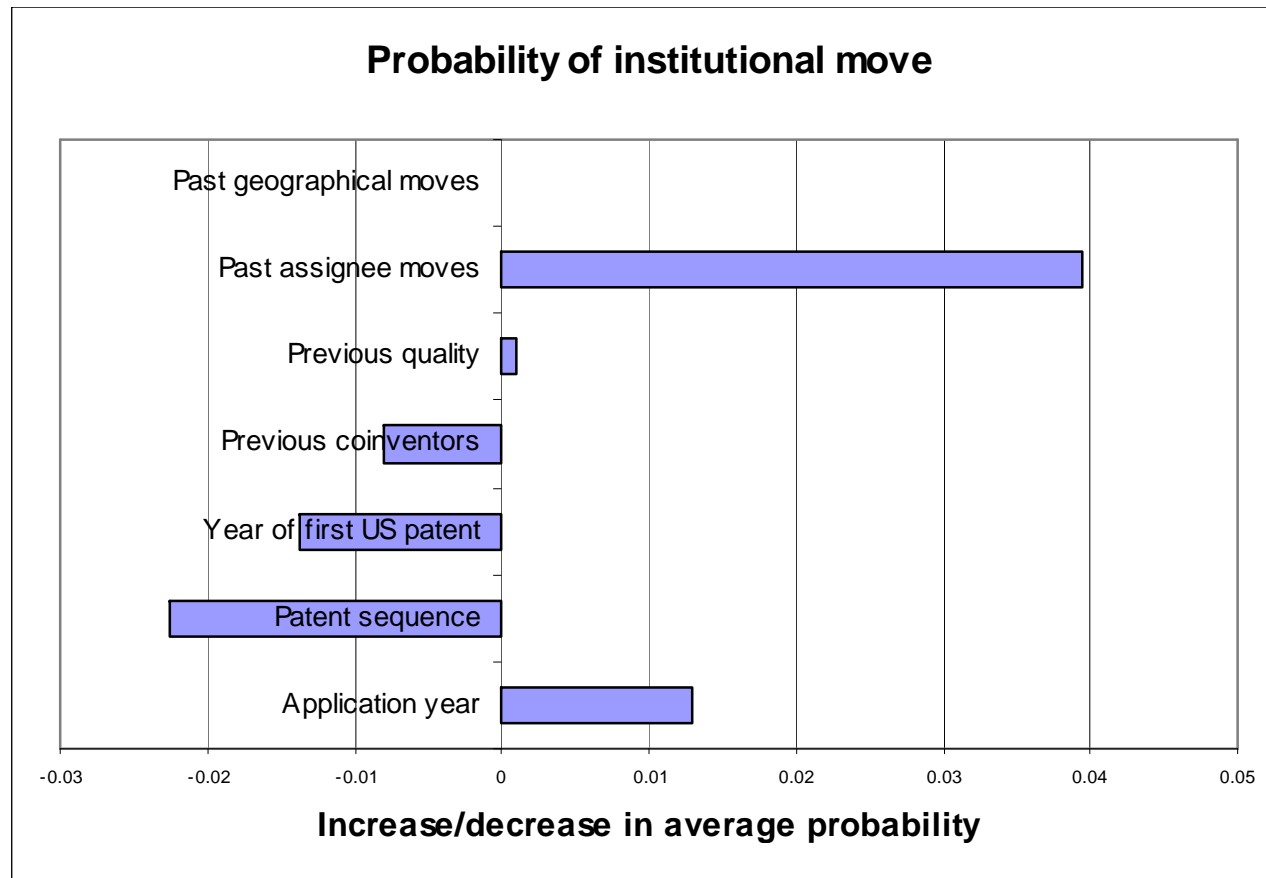


Determinants of geographic mobility





Determinants of institutional mobility





Concluding Remarks

- Australian inventor level data can provide further valuable insights into innovation activities in Australia
- Australian inventors:
 - Older
 - Less likely to be associated with large firms
 - Less likely to be university graduate
 - Domestic applicants reflect population distribution
 - With US patents => more concentrated VIC and NSW
 - Have higher than average quality US Patents
- Australian inventors:
 - Have 30% of their inventions allegedly copied by a third party
 - Use letter of infringement warning much more significantly than court filings
 - More concerned with illegal copying at the development phase
 - Australian inventor mobility:
 - Lower (international) compared to inventors from Israel
 - Flows from/to USA most significantly than other countries
 - Negatively correlated with patent quality (geographic move)
 - Positively correlated with patent quality (institutional move)
 - Higher at more recent time