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Australian Government

Department of Agriculture, Fisheries and Forestry
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Productivity growth in developed countries: Australia

*Presentation to 2013
IATRC Symposium*



Peter Gooday

Australian Bureau of Agricultural and Resource Economics and Sciences

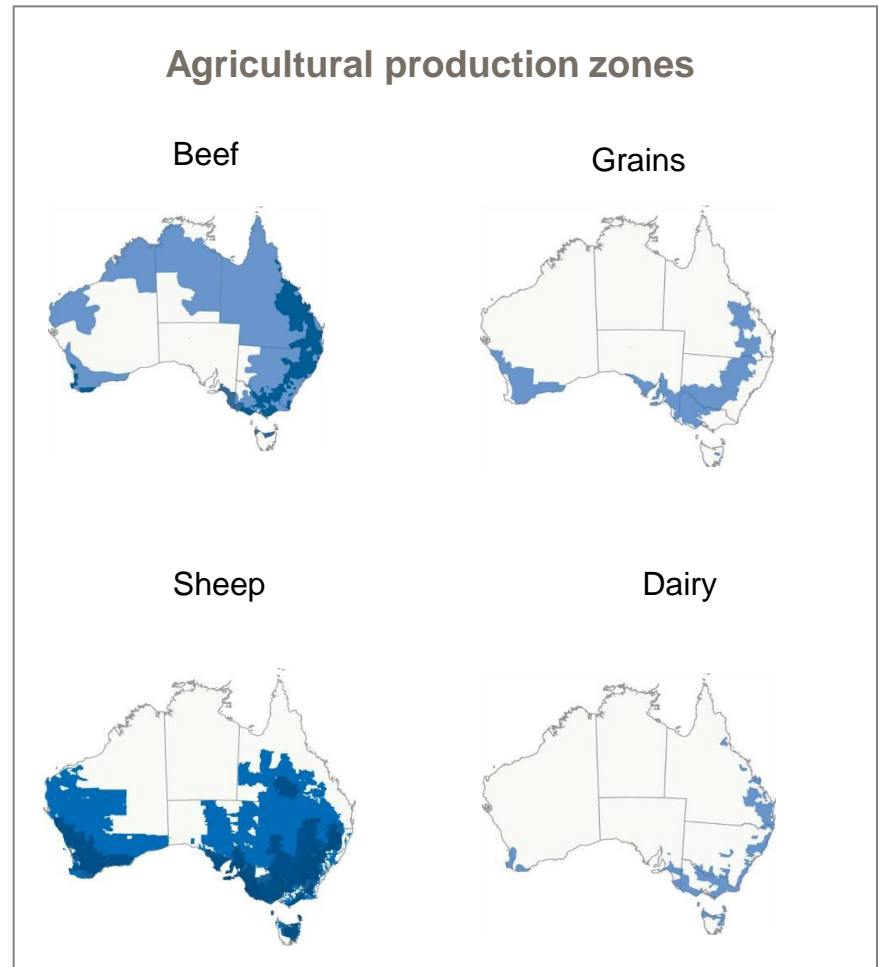
2 June 2013

Australian agriculture

- Mechanisation, fertiliser, feed
- Improved crop varieties, pasture types, livestock breeds
- Fewer, larger farms
- Growing resource pressures
- Ageing farm population
- Global food and fuel demand

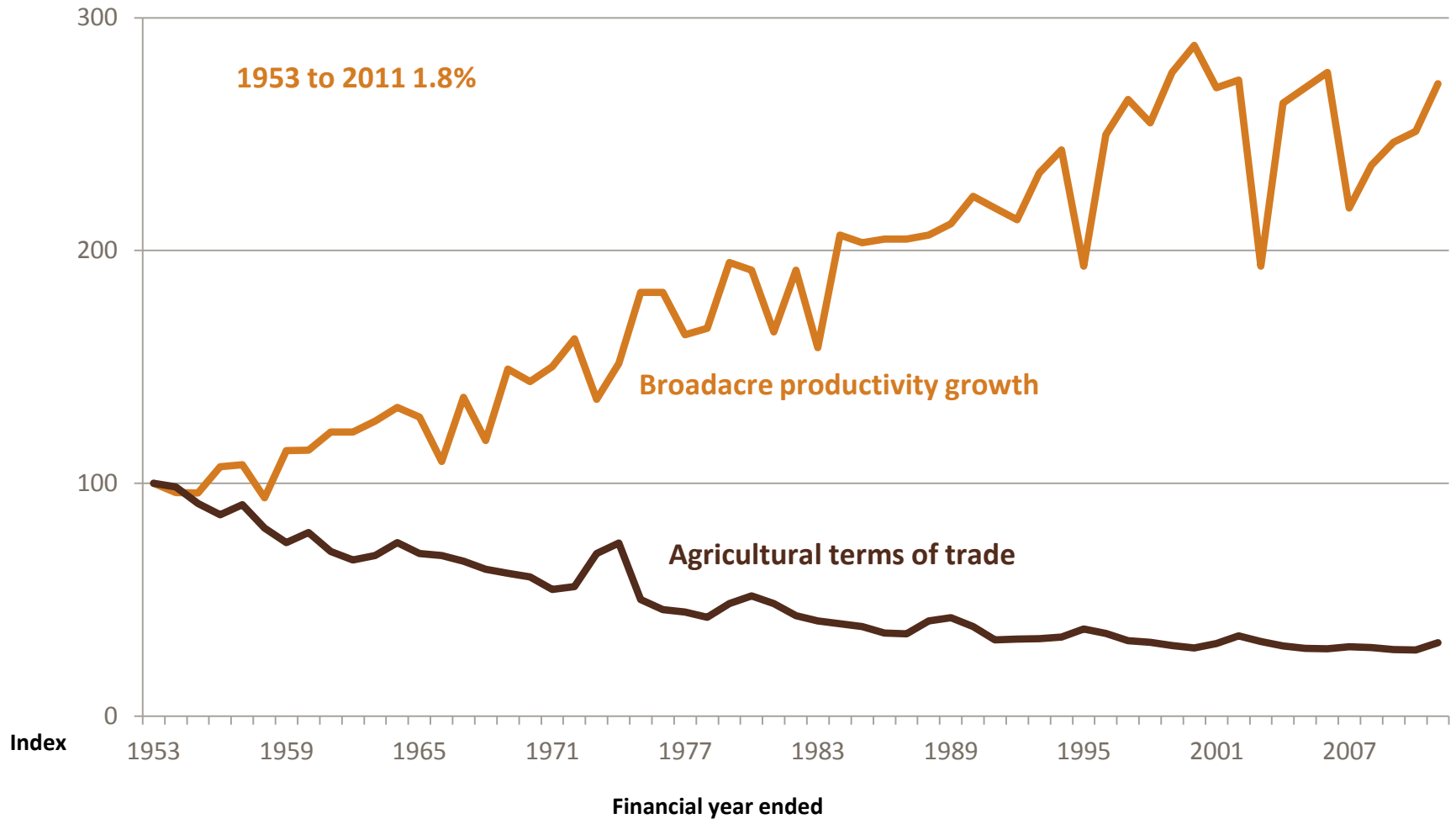
Australian agriculture

- A\$52 billion produced in 2011-12
- 2.4% of Australian GDP and 2.5% of employment
- Broad national presence
- Two-thirds of production exported



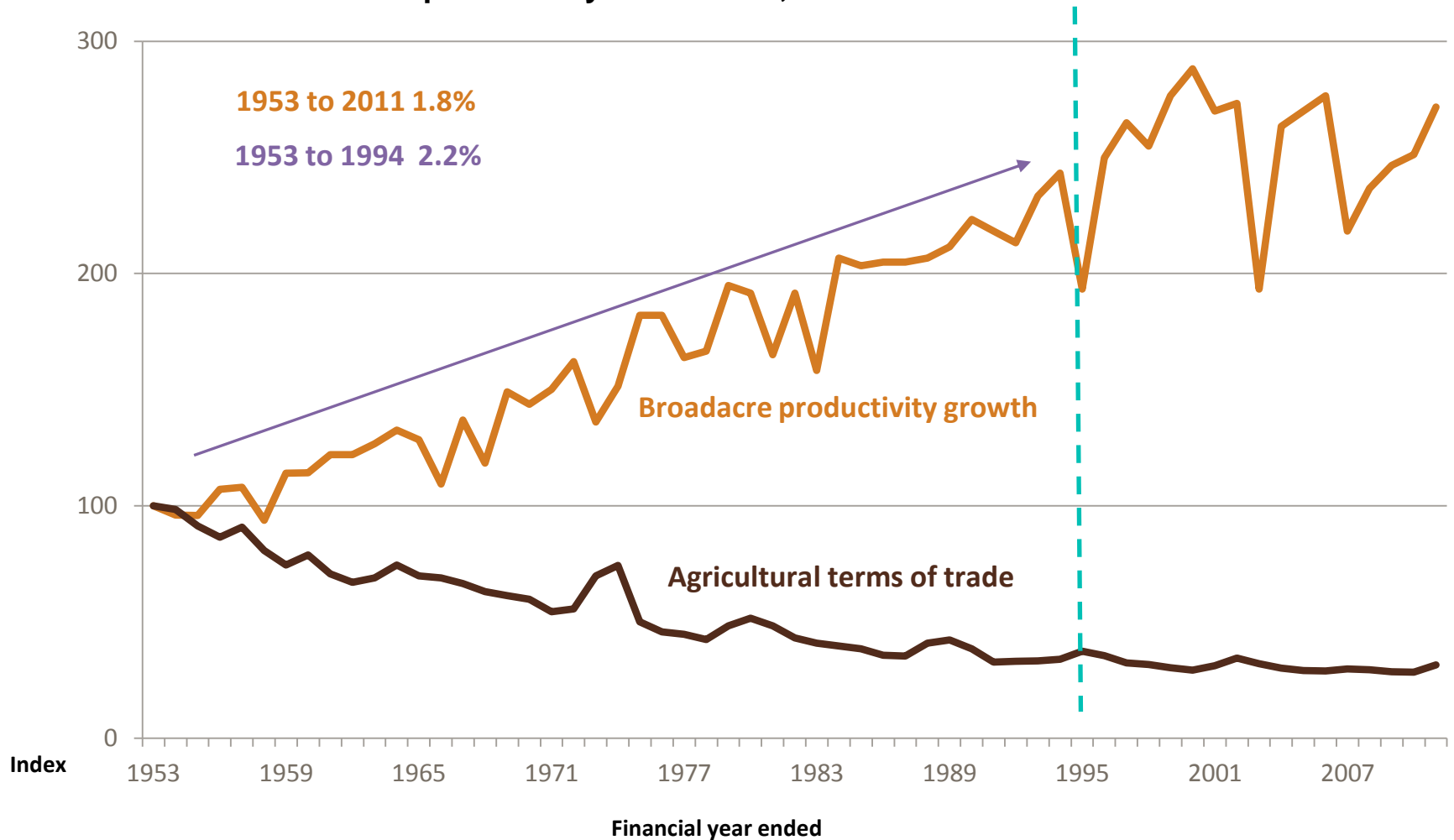
Productivity in Australian agriculture

Broadacre total factor productivity in Australia, 1953-2011



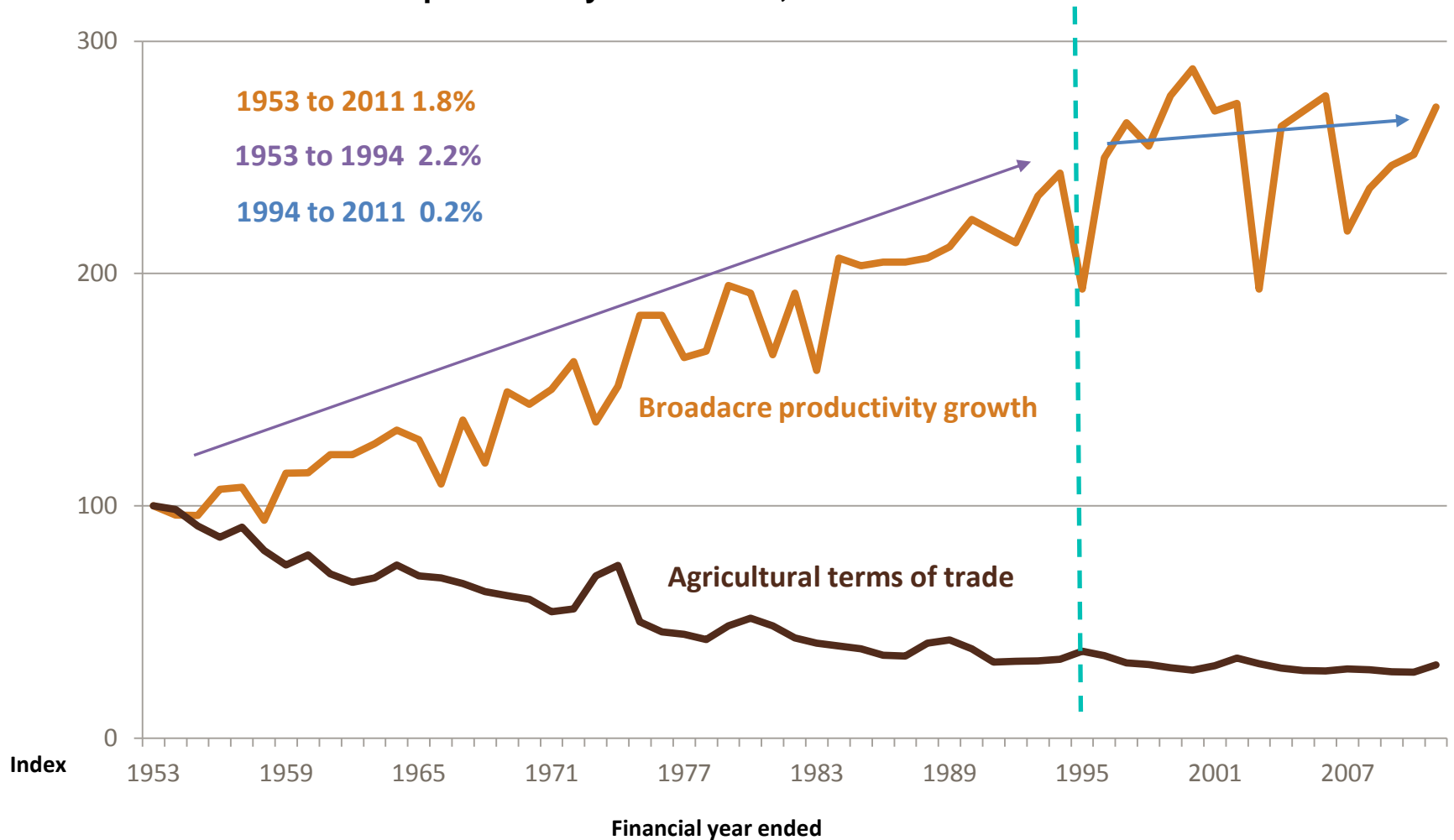
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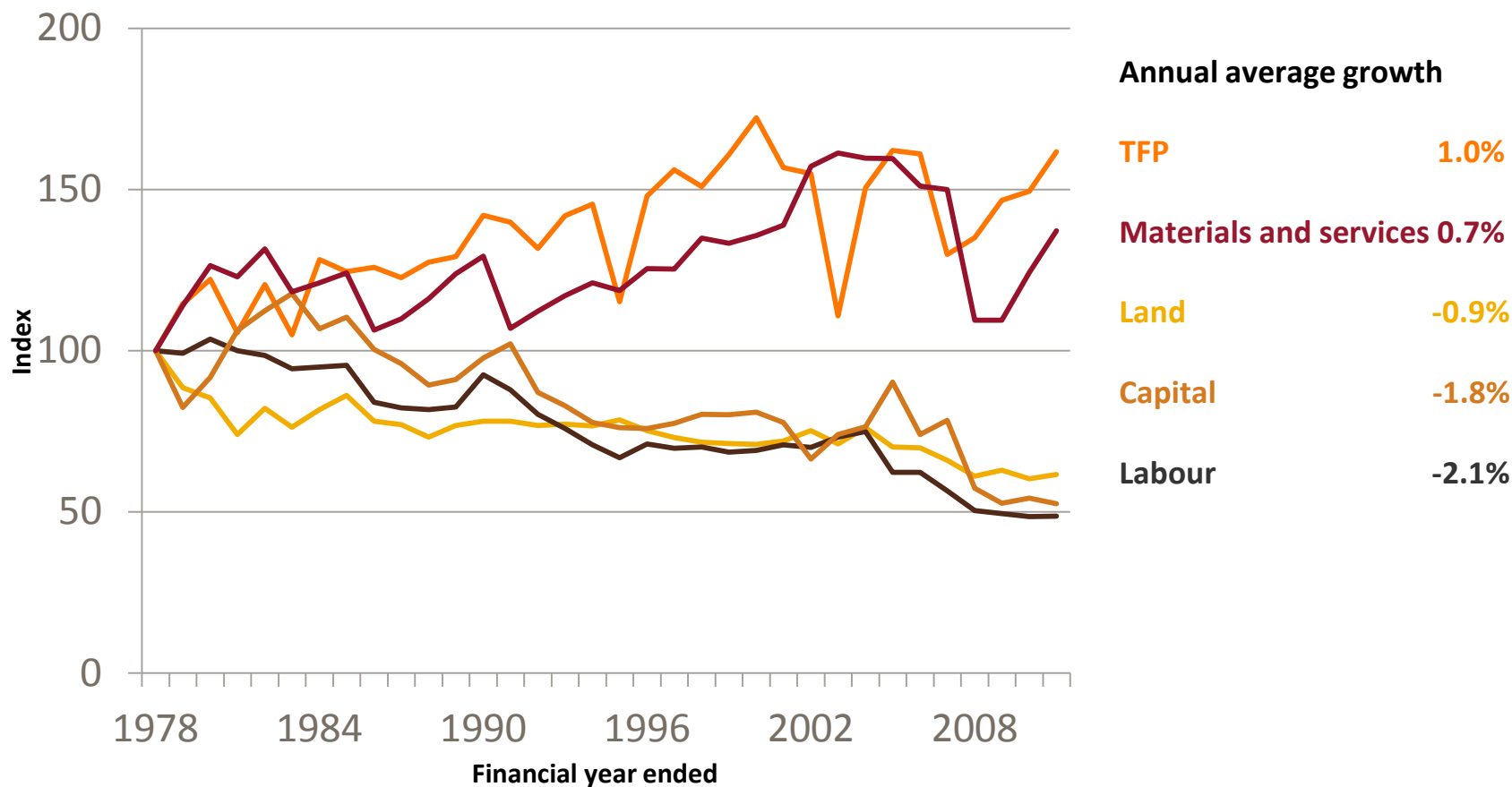


Productivity in Australian agriculture

Broadacre total factor productivity in Australia, 1953-2011



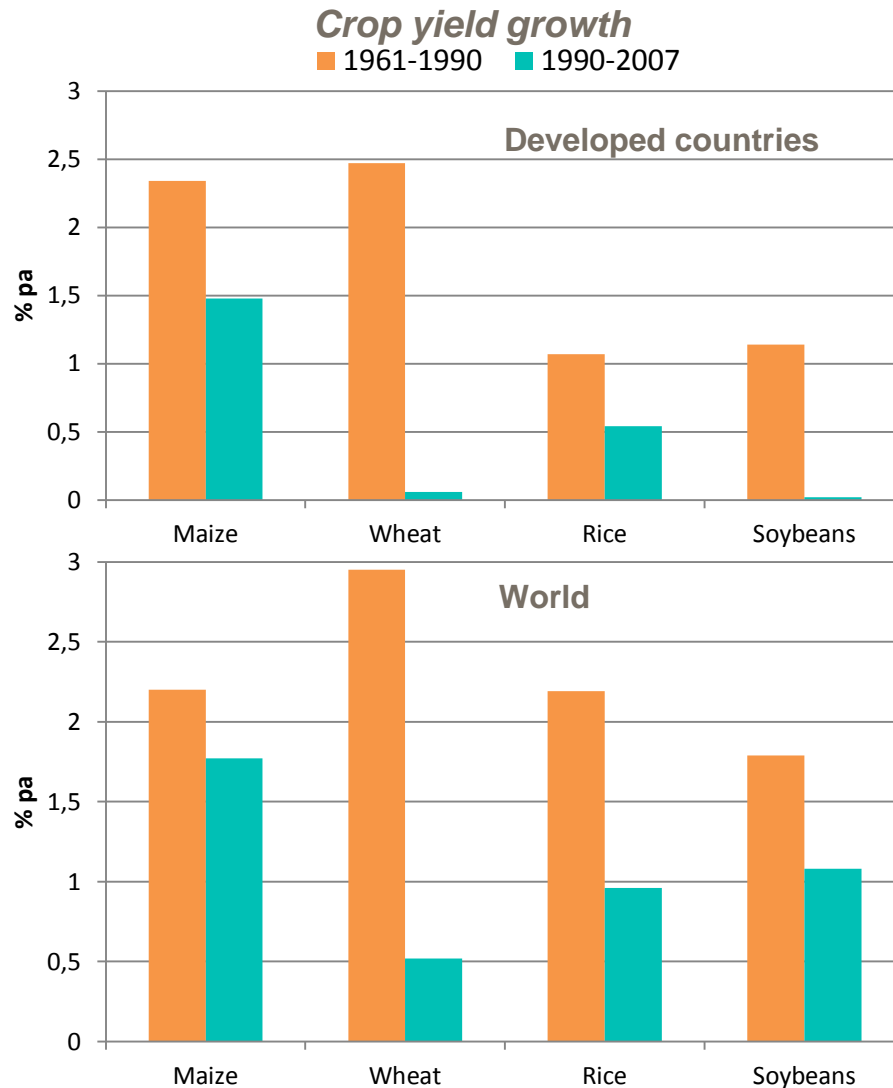
Productivity in Australian agriculture: changing input use (1978 – 2011)



Challenges for agricultural productivity

- Technology
- Resources
- Society

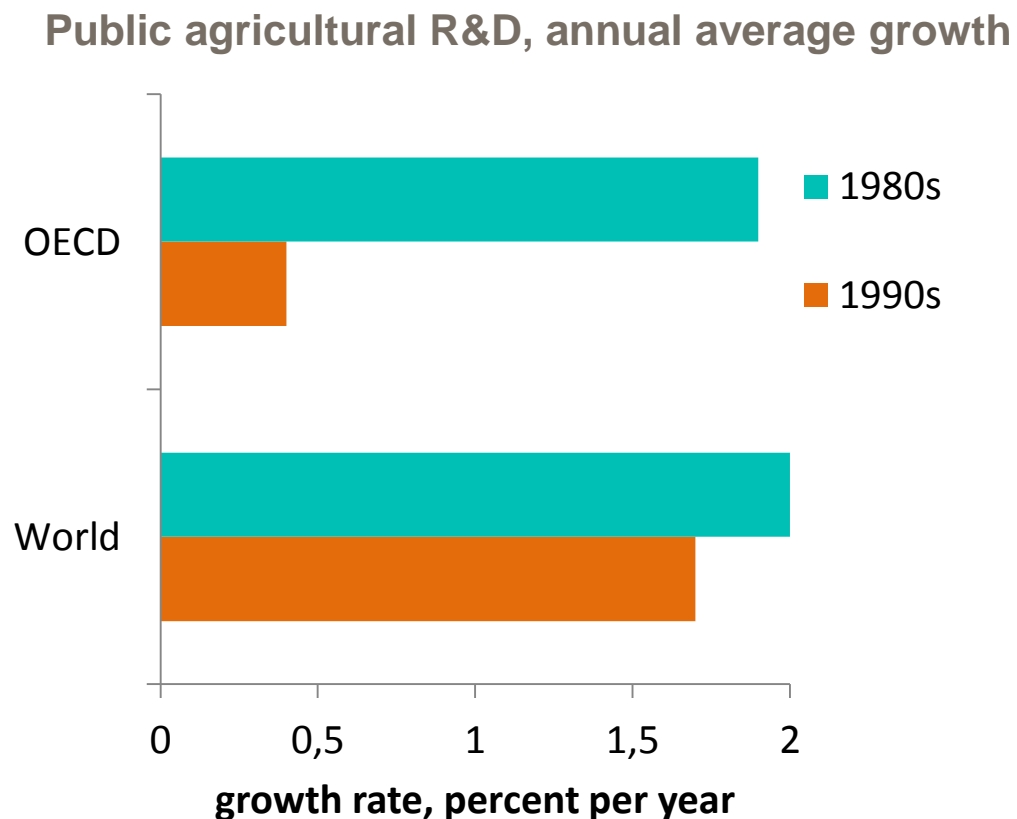
Technology: slowed rate of global progress



- Yield growth slowing for major cash crops
- Slower rate of technological change
- Slower uptake of technologies
- Fewer big gain technologies
- More complex technologies
- Lower confidence

Technology: changes in R&D

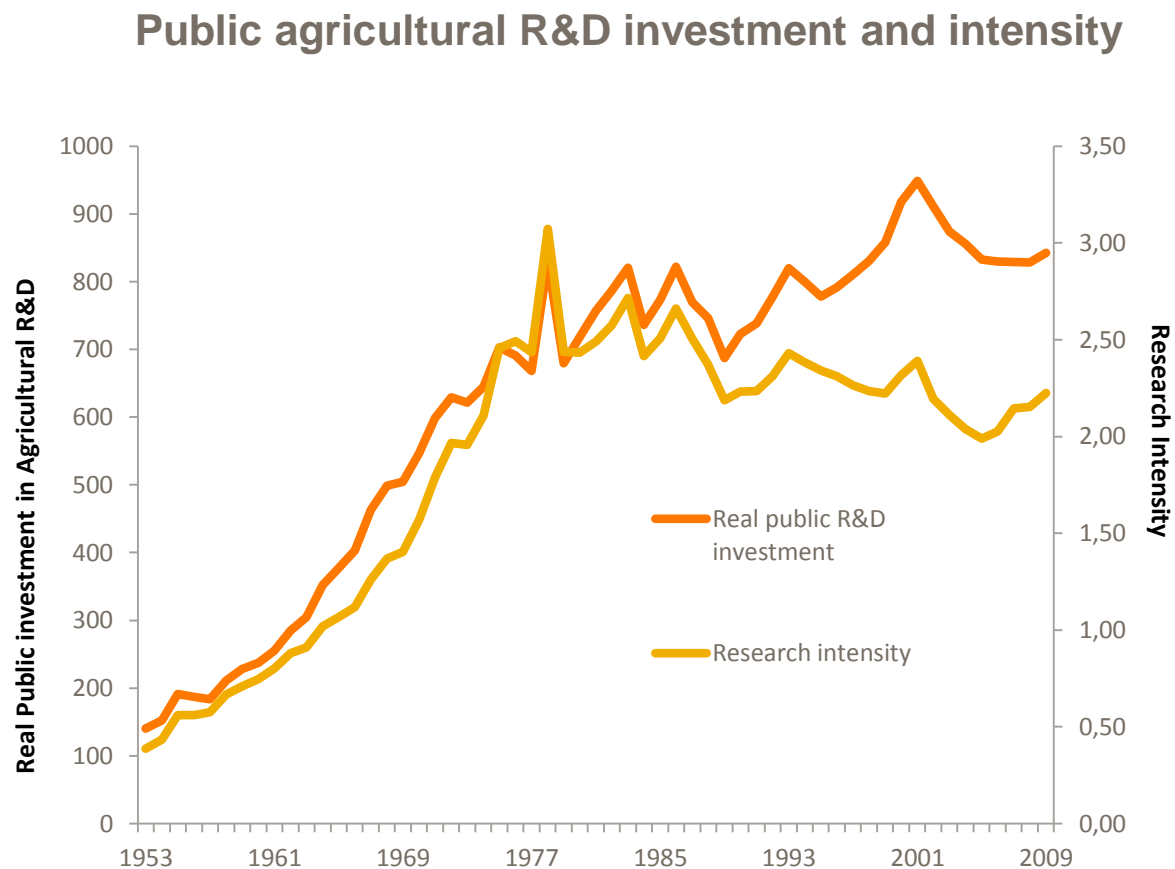
- Slowing growth in public R&D investment



Source: Pardey and Pingali (2010).

Technology: changes in R&D

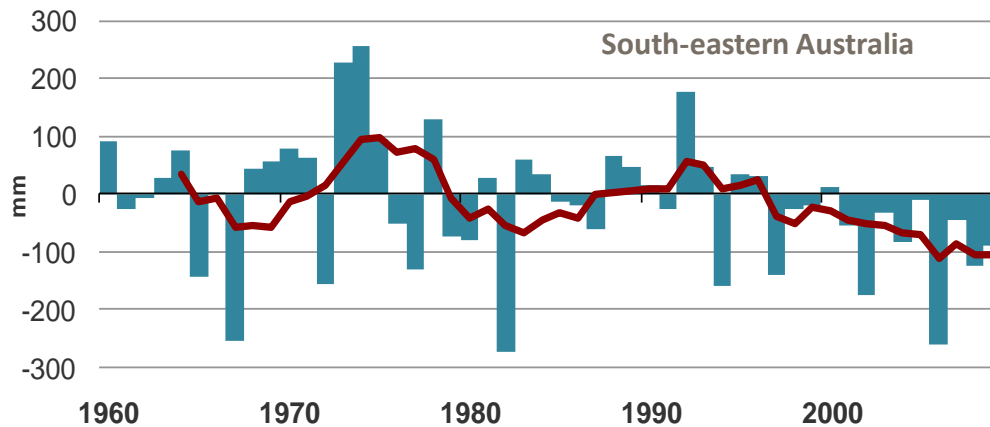
- Slowing growth in public R&D investment
- Shift away from public extension
- Changing R&D priorities



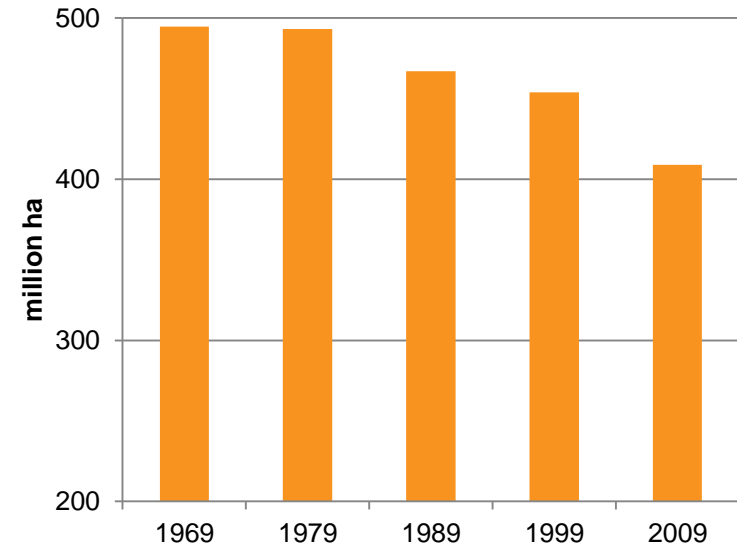
Resources: growing resource pressures

- Land and water availability
- Climate variability
- Ageing population
- Urbanisation
- Pests and diseases

Annual rainfall anomaly
– based on 30 year average (1961-1990)



Australian area under agricultural production



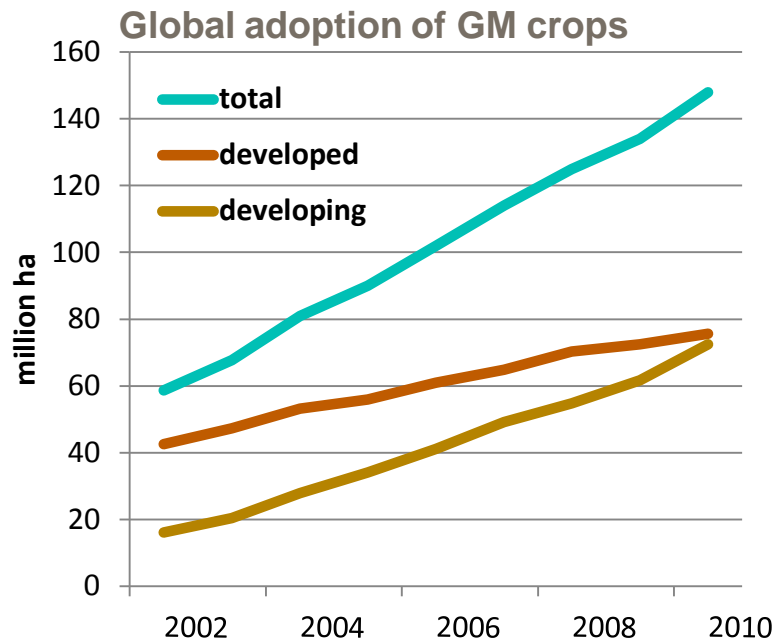
Australian locust plague, 2010



Society: preferences affect productivity

Growing concerns from society

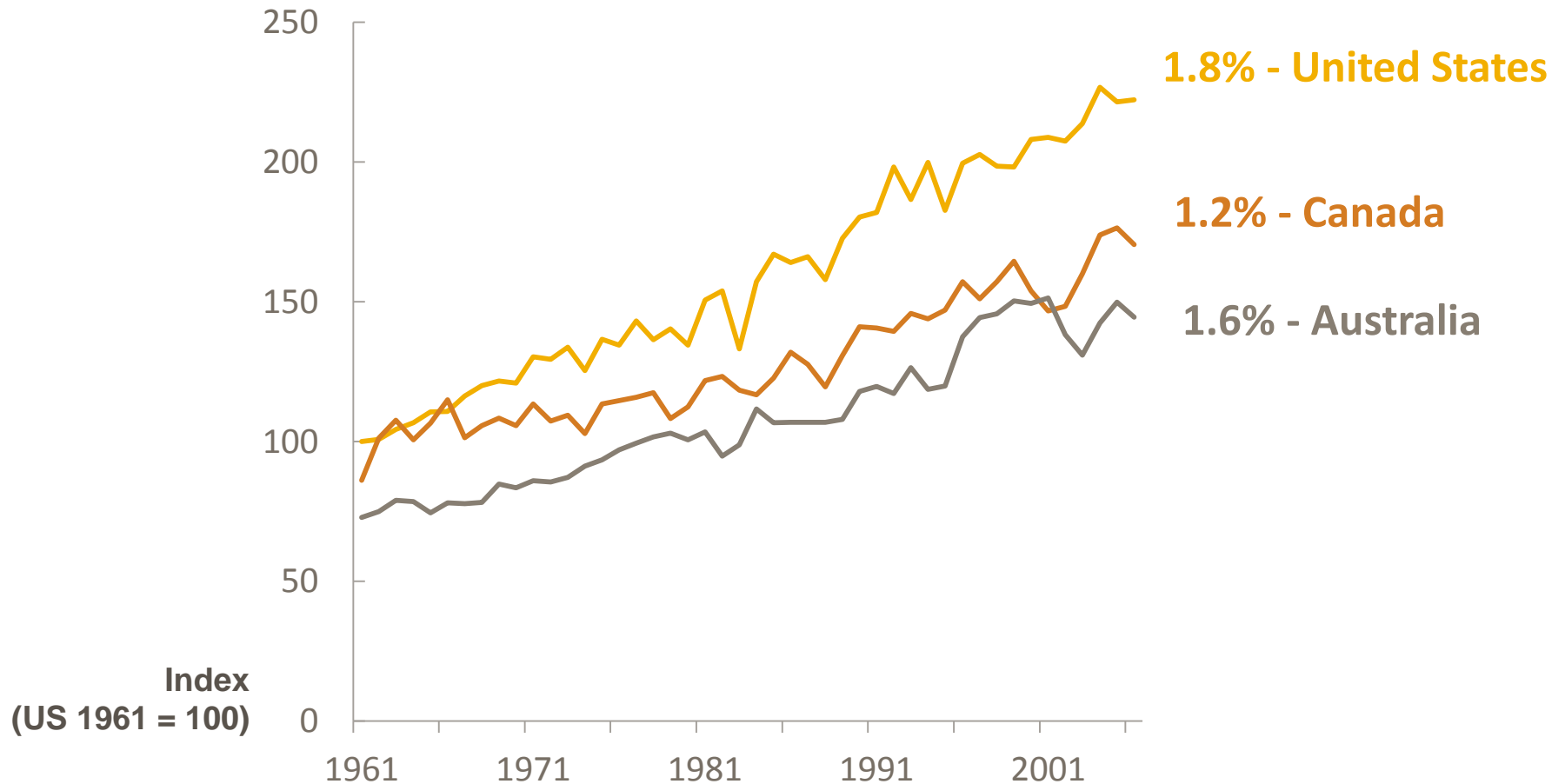
- Biodiversity and vegetation
- Animal welfare
- Health and safety
- Trade and foreign investment



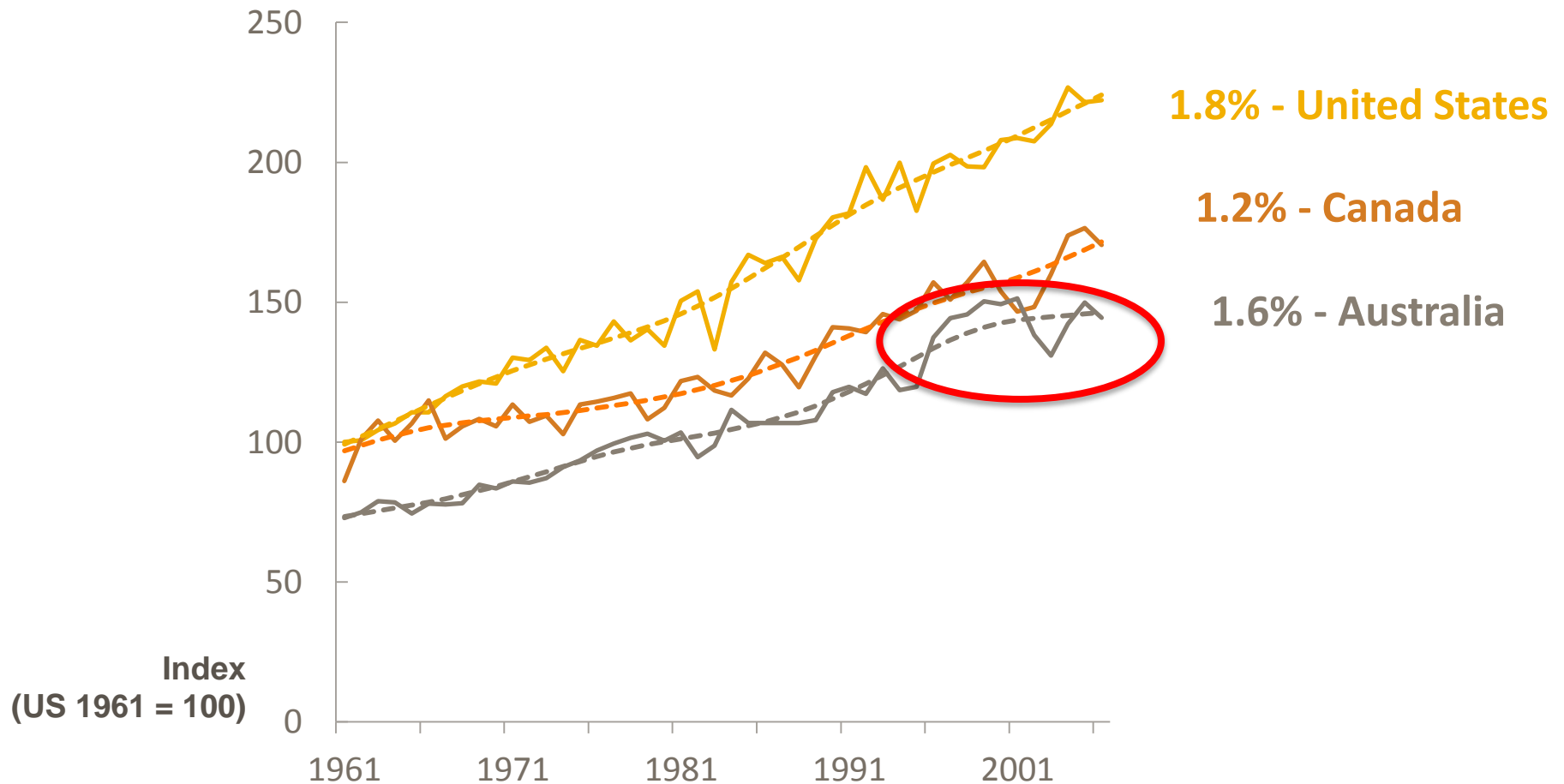
Source: ISAAA (2011)



International productivity performance



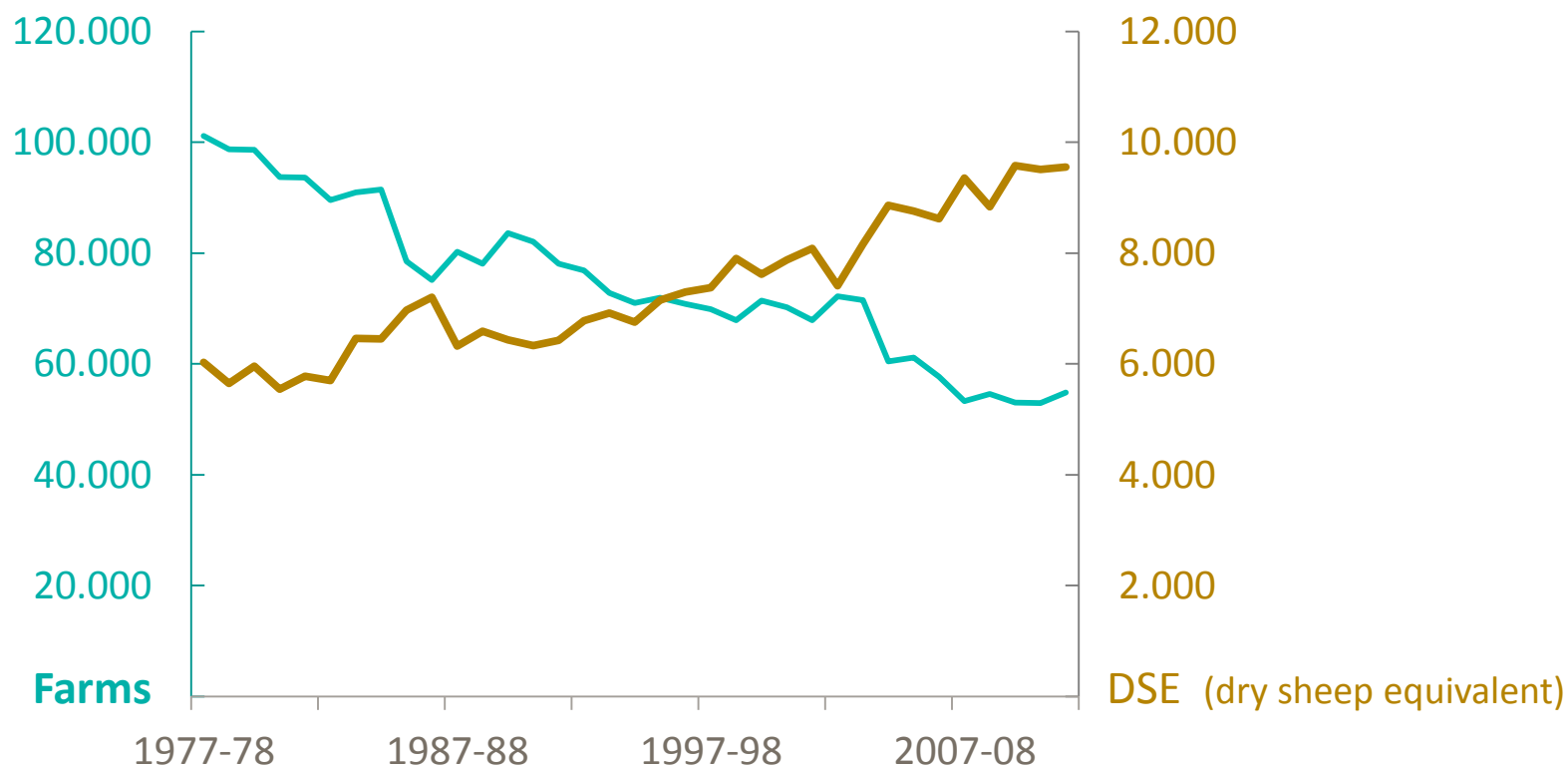
International productivity performance



Structural change in broadacre

Population of broadacre farms

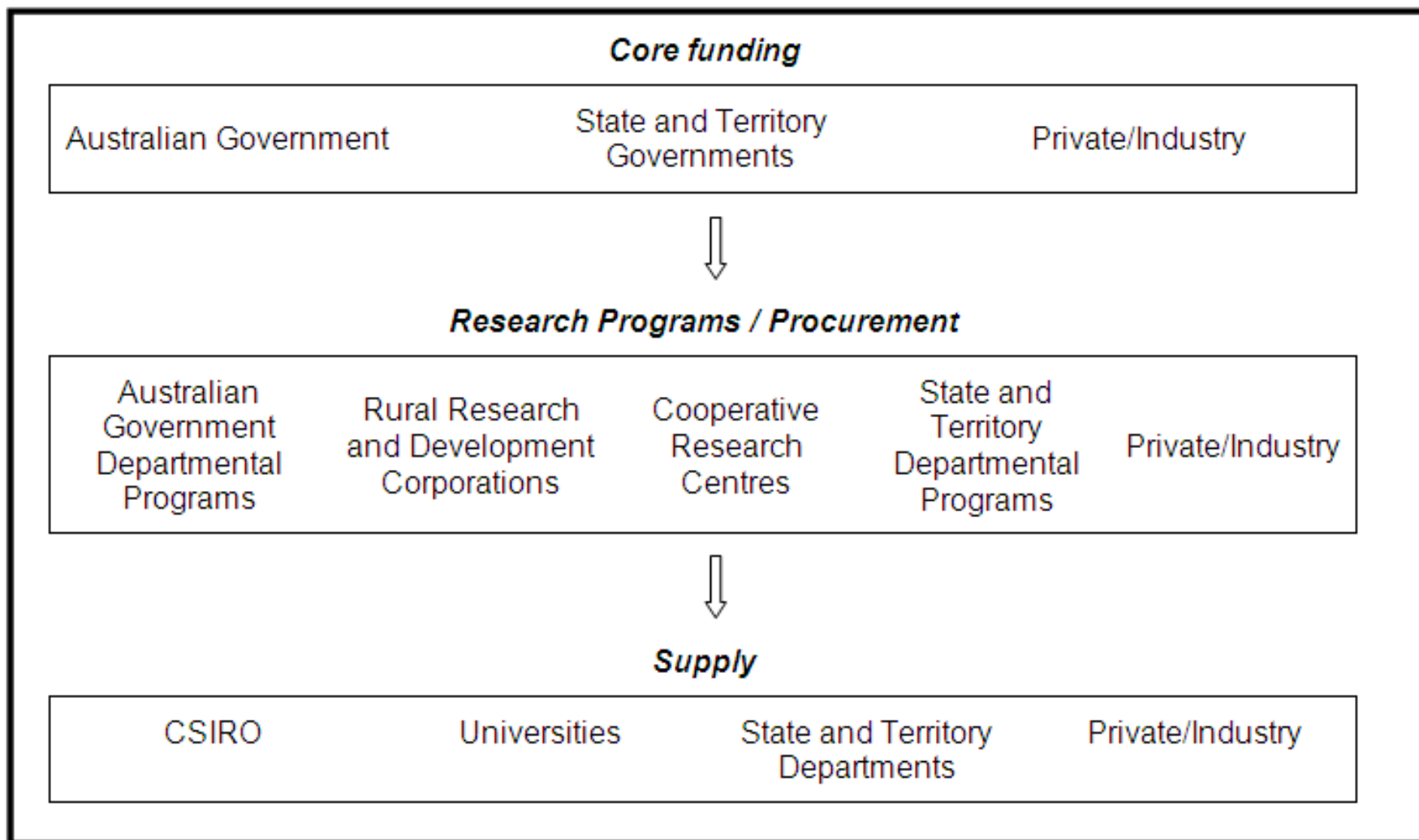
Average farm scale



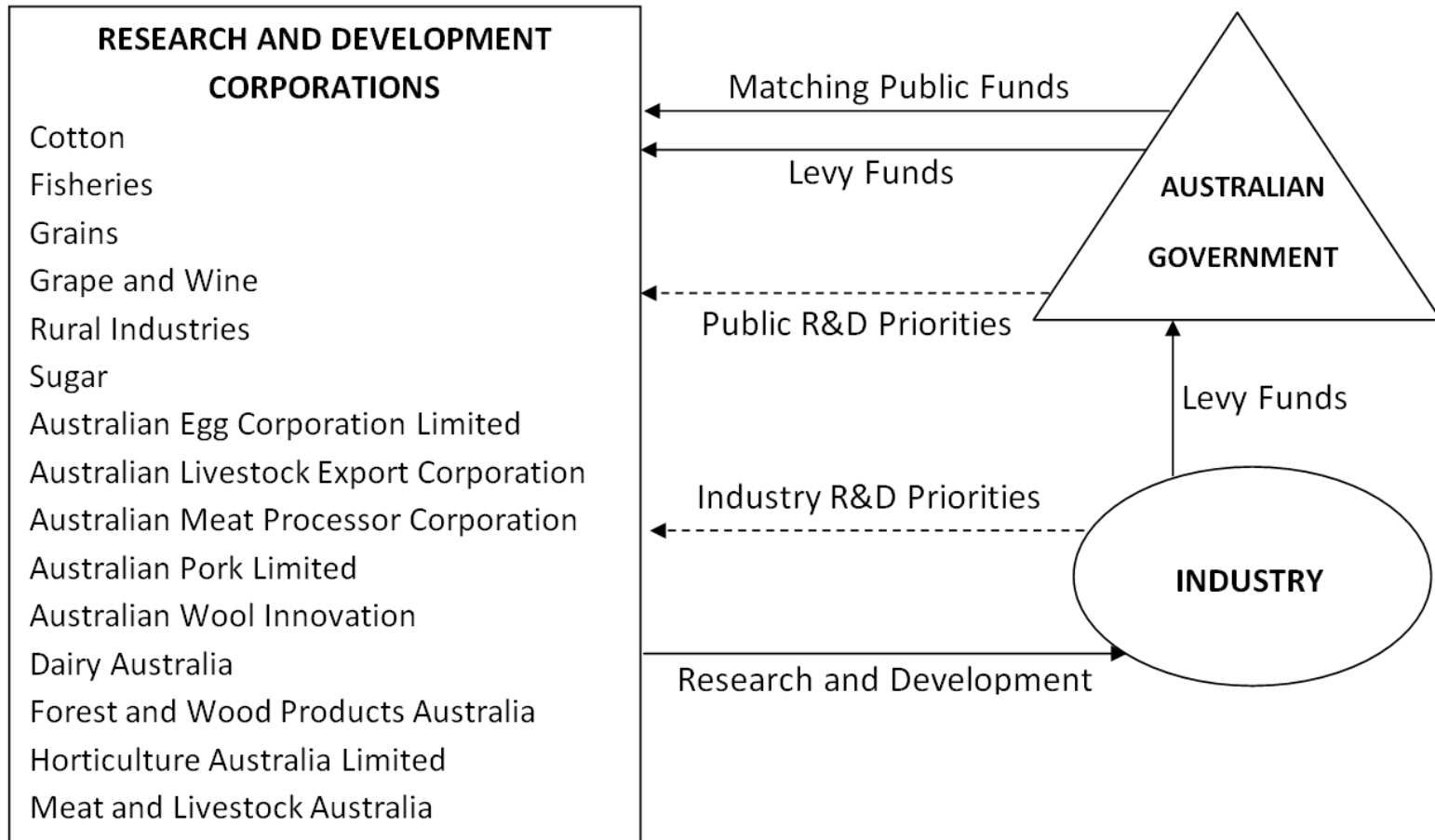
Changing sources of growth

1. Many reforms complete
2. Cropping technologies extensively adopted
3. New technologies are required

Australia's Research and Development System

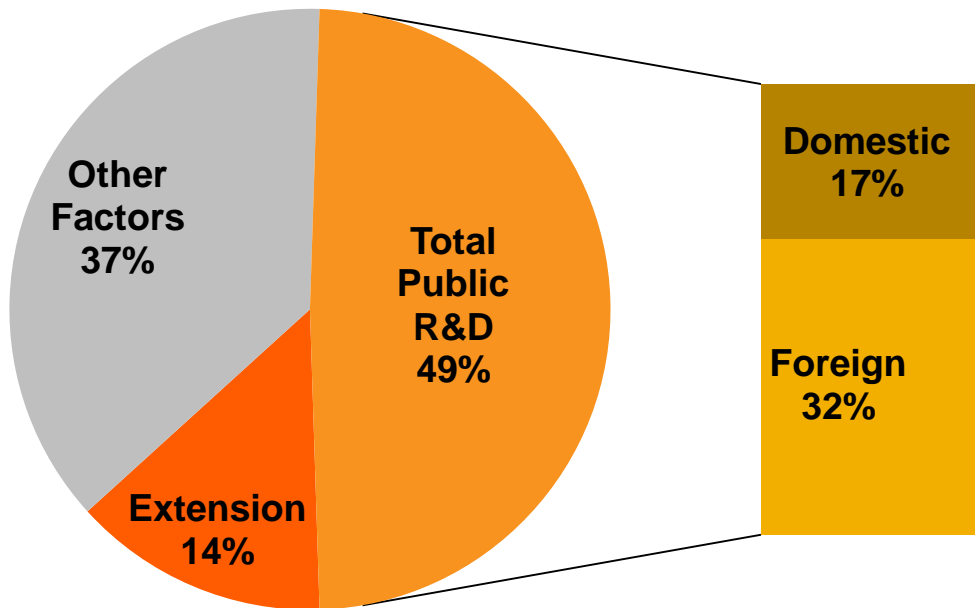


Research and Development Corporations Model



Technology: lifting productivity potential

Contribution of RD&E to Australian agricultural productivity growth



- ✓ Public R&D and extension account for almost 2/3 of agricultural productivity growth
- ✓ Long lags between R&D investment and productivity payoffs
- ✓ Balance between extension and R&D

On-farm determinants of innovativeness & productivity

- ✓ Tertiary education
- ✓ Labour availability
- ✓ Land use intensity
- ✓ Farm size
- ✓ Off farm income
- ✓ Use of contract services

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Farmers with **university qualifications** were 7% more likely to be high innovators (compared with those who had completed year 12 only)

A 1% increase in **farm size** increased the probability of being a high innovator by 4%

Conclusion

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- Foster research and development
- Minimise (environmental) regulatory burden
- Pursue broader reform agenda

Conclusion

- Foster research and development
- Minimise (environmental) regulatory burden
- Pursue broader reform agenda
- R&D becoming increasingly important
- Sustained effort required



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Thank you

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