Creating value in an increasingly connected world

Steve Hatfield-Dodds
Australian Bureau of Agricultural and Resource Economics and Sciences

6 - 7 March 2018
Value of Australian agricultural production has increased steadily over recent years.

Real gross value of agricultural production
f ABARES forecast. z ABARES projection.
Source: ABARES; Australian Bureau of Statistics
... and we’re forecasting the gross value of production to be around $63 billion in 2022-23

Real gross value of agricultural production
f ABARES forecast. z ABARES projection.
Source: ABARES; Australian Bureau of Statistics
The value of agricultural exports has grown by $13 billion over the last 10 years

Real gross value of agricultural exports

ABARES forecast. ABARES projection.

Source: ABARES; Australian Bureau of Statistics
We are forecasting increased export values for most major agricultural commodities...

Source: ABARES

f ABARES forecast.
... with the total value of exports forecast to grow to almost $50 billion over the next 5 years

Real gross value of agricultural exports
f ABARES forecast. z ABARES projection.
Source: ABARES; Australian Bureau of Statistics
Global economic growth recovered in 2017 and is assumed to accelerate over the next few years...

Source: ABARES; International Monetary Fund

a ABARES assumption. b includes China.
...and the Australian dollar is assumed to weaken over the outlook period

US$0.78 2017-18
US$0.76 2018-19
US$0.74 2019-20 to 2022-23

Note: Historical data based on monthly average.
Source: ABARES; Reserve Bank of Australia
Snapshot

Contributions of Australian Agriculture

Agriculture as a share of national total
Source: ABARES; Australian Bureau of Statistics; Geoscience Australia
Snapshot

Contributions through value added exports is larger than the value of raw commodities

- Minimally transformed: 35%
- Substantially transformed: 64%
- Elaborately transformed: 1%

Total value of food exports was $43 billion in 2016-17

Source: ABARES; Australian Bureau of Statistics
Snapshot

Context of Australian agriculture

We manage highly variable climate, with low producer support

Rainfall variability index

<table>
<thead>
<tr>
<th>Country</th>
<th>%</th>
<th>0.1</th>
<th>0.2</th>
<th>0.3</th>
<th>0.4</th>
<th>0.5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ukraine</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>United States</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>New Zealand</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brazil</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Canada</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Departure from mean rainfall (%), 1970-2015

Note: Departure from mean rainfall calculated as a probability density function, which shows the spread of possible values around the mean. Source: The World Bank Group – Climate Change Knowledge Portal
**Snapshot**

**Composition:**
A small number of farms deliver the lions share of output

Average output (total receipts) for each decile, broadacre livestock farms

Notes: Average of beef, sheep and sheep-beef farm cash receipts, 2014-15 to 2016-17 (preliminary estimate).
Output shares are percentages. Shares may not add to 100 due to rounding. Source: ABARES
Snapshot
Composition:
A small number of farms deliver the lion's share of output

Average output (total receipts) for each decile, broadacre cropping farms
Notes: Average of cropping farm cash receipts, 2014-15 to 2016-17 (preliminary estimate). Output shares are percentages. Shares may not add to 100 due to rounding. Source: ABARES
Key challenges
each involving threats and opportunities for agriculture

- Asia re-emerges
- Climate
- Competitiveness Race
- Consumer Preferences
- Resource Scarcity
Asia re-emerges
Well over 3 billion people in high income nations by 2050, driven by Asia.

Distribution of historical and projected real global GDP per capita by countries and regions, 2015 and 2050
Notes: High income threshold US $12,000 GDP per capita (World Bank (2014); a Includes Asian nations Japan and South Korea, and non OECD countries Bulgaria, Croatia, Lithuania and Romania; b Emerging and developing Asia; c Brazil, Russia and South Africa.
Source: Data from Hatfield-Dodds, Schandl et al. 2017
Nominal Producer Support estimate ratio, selected countries

Notes: PSE is calculated as the difference between the value of gross farm receipts at the farm gate relative to farm output valued at border prices. Percentages at right indicate change from 1996 to 2016.

Source: OECD 2018
Competitiveness race

Australian productivity growth is keeping pace with advanced economies, but emerging producers are catching up

Change in productivity from base year, selected countries

Notes: Index of total factor productivity at constant real prices. Average of 1962 to 1967 = 100.
Source: US Department of Agriculture Economic Research Service 2017
Competitiveness race
Price has made a bigger contribution than volume over last two decade

Increase in gross value of production (nominal), and contributions of price and volume

Note: Index of cumulative change in output value from base period, calculated as average for 1994-95 to 1998-99 = 1. Numbers in parenthesis in key indicate index value in final year.
Source: ABARES
Climate variability and change is likely to accelerate and intensify, presenting threats and opportunities.

Climate adjusted productivity for cropping farms

Note: Index of cumulative change in output value from base period, calculated as average for 1977 to 1982 = 100.

Source: ABARES
Climate variability and change
National and global policies will also present opportunities and disruption

No change
- Crops and horticulture
- Livestock and dairy
- Native forest and woodland
- Native shrubland and grassland
- Other

Change in use or most profitable use by 2050
- Native habitat from crops and horticulture
- Native habitat from livestock and dairy
- Carbon plantings from crops and horticulture
- Carbon plantings from livestock and diary
- Energy feedstocks or mixed food and energy, from livestock or dairy
- Energy feedstock or mixed food and energy, from crops and horticulture

Source: CSIRO 2015 Australian National Outlook
Resource scarcity

“Buy land, they’re not making it anymore”
Resource scarcity
... makes it crucial to support efficient resource allocation

Historical water use in southern Murray-Darling Basin
Water use by irrigation activity and water allocation price
Source: ABARES; Australian Bureau of Statistics
Resource scarcity
... makes it crucial to support efficient resource allocation

Modelled long-run change
Change in underlying water demand and use by irrigation activity
Source: ABARES
Consumer preferences

Reputation is a common property resource

Fire crews respond to BP’s Deepwater Horizon fire and oil spill, 2010
Source: Shutterstock 2018
Consumer preferences
Attitudes are complex and will continue to evolve

Dominant concerns today

... mapped to GDP in 2050

Source: Edelman Trust Barometer 2015

Source: Dominant concerns from Edelman (2015) applied to projected GDP in 2050 from Hatfield-Dodds, Schandl et al. (2015)
Challenges, threats and opportunities for Australian agriculture

- Asia re-emerges
- Climate
- Competitiveness Race
- Consumer Preferences
- Resource Scarcity