

ASSESSING THE COMPETITIVENESS OF AUSTRALIAN AGRICULTURE

In responding to increased competition domestically and in international markets, it is important for policy makers and participants in the Australian agriculture sector to gain a better understanding of the factors that contribute to national agricultural competitiveness. This research investigated the potential development of a competitiveness indicator or index as a tool to inform decision-making about ways to enhance agricultural competitiveness.

There already exists some preliminary research into the development of a competitiveness index as an indicator of national agricultural competitiveness. However, *Assessing the competitiveness of Australian agriculture* was designed to undertake a more detailed investigation of both the value of national competitiveness indexes, and the potential to develop such an index for use in comparing the agricultural competitiveness of Australia and other comparable nations.

A trial composite agricultural competitiveness index was constructed for seven nations, and the resulting index was compared with the actual performance of the relevant agriculture sector. For a range of reasons the competitiveness index was found to not robustly correlate with national agriculture sector performance.

Whilst the research found that a composite index may not meet policy maker's needs, subsequent research involved the development of a series, or 'dashboard', of indicators of national agricultural competitiveness. A case study was developed in which the dashboard approach was applied, comparing the agricultural competitiveness of Australia and the USA. The process illustrated that the dashboard provides a more useful approach, but only to the extent of providing a starting point for further analysis.

One major limitation in all the processes designed to better understand relative national agricultural competitiveness was a lack of robust, internationally-comparable agriculture sector statistical data. This research recommends that efforts be made to improve the quality and consistency of available agriculture sector data, at both a national and international level.

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WHO IS INTERESTED?

This research is of interest to a broad range of stakeholders concerned about Australia's agriculture future and factors that influence competitiveness and agricultural industry sectors:

- Owners of farm businesses.
- Agribusiness and service providers.
- Agricultural industry sectors and associates.
- Australian and State Governments.
- Agricultural research providers.

UNDERSTANDING AGRICULTURAL COMPETITIVENESS

The increasingly global nature of agricultural markets has encouraged a greater focus on research into agricultural competitiveness.

Assessing Competitiveness?

Assessing the competitiveness of a national economic sector is a complex task, as there are a wide range of different factors (from climate to exchange rates, for example) that can impact on the competitiveness of an agriculture sector, either in isolation or in combination.

Competitiveness has been defined in this research as a relative measure of the combined impact of a range of factors that affect the performance of businesses within a sector producing and trading goods and services, as well as supporting employment and raising living standards, over time.

Methods for investigating competitiveness

The full report provides an overview of some of the different assessment systems used internationally to assess the of a national economy, and some more specific to agriculture. The research shows that there is a range of methodologies used to compile assessments at a national, regional and sectoral level. It also notes the need for results they produce to be validated by the historic or subsequent performance of that nation, region or sector.

Assessments of competitiveness have generally been seen as an opportunity for stimulating meaningful discussions about decisions on economic reforms and productivity-enhancing investments, such as transport infrastructure. The development of a competitiveness indicator for Australian agriculture has the potential to provide a tool whereby the impact of changes to either national or agricultural policy on the competitiveness of the agriculture sector can be better understood. It also can provide a tool to monitor changes in relative competitiveness, as factors within and outside Australia change.

However, misunderstandings regarding the purpose of the comparison or use of an index, can lead to a poor interpretation of results. For example, it could result in wasteful spending of money supposedly to enhance an industry or nation's competitiveness in an area which has been wrongly identified as being important.

It is essential therefore that any indicators used to assess competitiveness are designed robustly, use accurate and timely data and are interpreted in a holistic manner.

“ Productivity growth in agriculture, which reflects increases in the efficiency of production processes over time, is a key determinant of farm profitability and an important mechanism for maintaining international competitiveness ”



A trial agricultural competitiveness index

Having identified potential advantages and disadvantages of a competitiveness index as a policy tool, the research proceeded to test its applicability to Australian agriculture. It analysed whether such a system could provide a useful tool to encourage policy focus on factors likely to enhance the competitiveness of the sector.

A **methodology** for the trial involved the development of a list of those factors that are important in enhancing the performance of farm businesses. Two categories of factors were identified – national and agricultural. For both of these six different sub-factors were identified, and time-series statistical indicators collated. The lack of consistent national agricultural statistics means that the agriculture-sector indicators selected for inclusion in the competitiveness assessment needed to be higher-order and aggregated indicators.

Data for each indicator was compiled and assessed for seven national agricultural sectors for the period from 1960 to 2013, or for the period over which comparable national data was available. The seven national agriculture sectors selected for inclusion in the comparison were Australia, New Zealand, the USA, Canada, Brazil, Ukraine and South Africa.

Validation of the data was undertaken. The usefulness of any of the composite indices developed (either weighted or unweighted) is highly questionable for a number of reasons:

- The complexity and variability of factors that contribute to an agriculture sector's competitiveness - many of the factors included in the analysis (for example exchange rates) vary through time as a consequence of factors not related to the agriculture sector.
- It is highly likely that the effect of several factors in combination (for example low exchange rates and improved infrastructure) might have a more significant impact on competitiveness than single factors in isolation.
- Factors suitable for inclusion in an indicator would be different depending on the primary purpose for which it is intended making it unlikely that a single agricultural competitiveness indicator would be of any real value.
- The quality and availability of comprehensive agriculture-sector statistics relevant to the factors contributing to the relative competitiveness of a national agriculture sector are not sufficient.



Conclusions drawn from the trial showed that none of the national indicators selected for inclusion in the analysis consistently correlated with the index value of RGVP for each nation. Even a factor such as exchange rates did not show a consistent relationship with the index of real national agricultural output. The results of the trial index made it apparent that it is highly unlikely that a single agricultural competitiveness indicator would be of any real value.

A national agricultural competitiveness 'dashboard'

Rather than developing a composite index, a preferred alternative may be to create a dashboard of some key indicators, and to utilise these as an indicator of factors that might improve agricultural competitiveness. The dashboard approach can be likened to the dashboard of a car, which provides the driver with information about a number of different systems that all contribute to the performance of the vehicle. It entails the collection of key indicators which could enable comparisons to be made of some of the important high-level contributors to the overall long-term competitiveness of a national agricultural sector.

Four widely available and relevant indicators which were assessed as providing a potential dashboard are:

- Total factor productivity.
- Agricultural revealed comparative advantage.
- Public agriculture Research, Development and Education (R, D & E) investment intensity.
- Organisation for Economic Co-operation and Development (OECD) producer support estimate.

» *Total Factor Productivity*

Total factor productivity (TFP) is estimated by comparing units of output with the units of inputs used to produce those outputs. If total factor productivity is increasing over time, then outputs are being produced more efficiently.

The breakout box below illustrates how this indicator was used in the research, the full report provides detail of the application of each of the four indicators.

TOTAL FACTOR PRODUCTIVITY OF SELECTED NATIONAL AGRICULTURE SECTORS

Subject to certain qualifications, the research indicates that New Zealand, Brazil and South Africa have all experienced relatively strong productivity growth over the past decade, which has likely contributed to enhanced competitiveness. On the other hand, the poor productivity performance of the Australian agricultural sector post 1997 is of major concern, as it is a very clear indication that the national agricultural sector is losing its competitiveness, relative to the other nations included in the analysis.

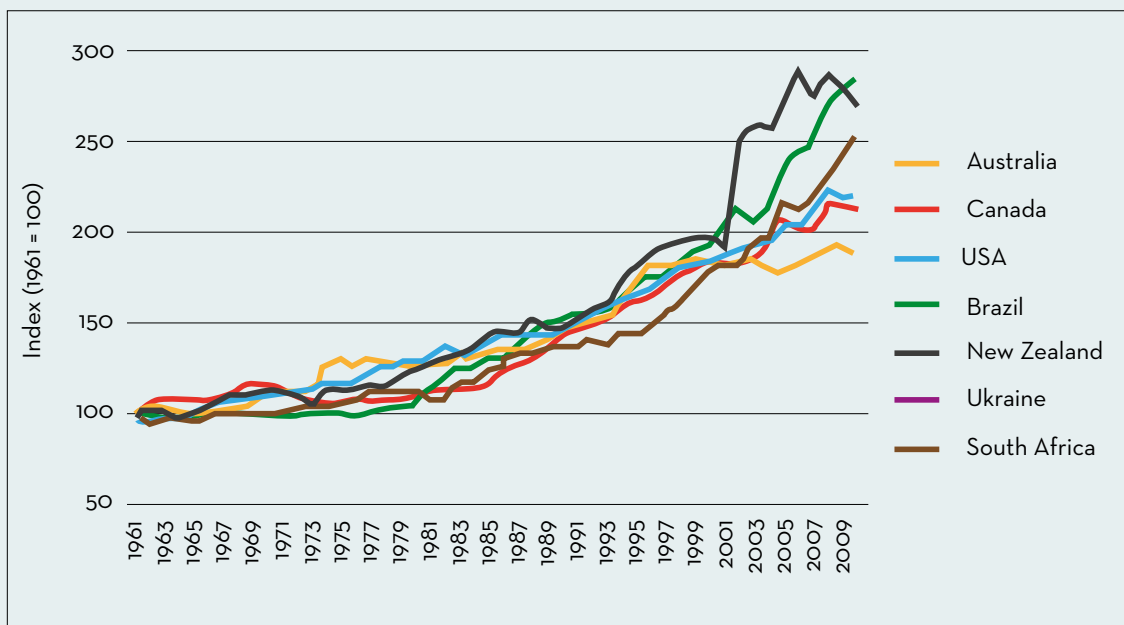


Figure 1 Total Factor Productivity of selected national agriculture sectors
(Source: Fuglie et al 2012)

» *Agricultural Revealed Comparative Advantage*

Revealed comparative advantage has been widely used as a measure of a nation's relative ability to successfully produce and export goods in comparison with its trading partners. Essentially, the measure uses historical patterns of trade to infer relative competitiveness, rather than attempting to identify and quantify all the various factors that may be contributing to that relative competitiveness.

» *Public agriculture research, development and extension (RD&E) investment intensity*

Agricultural research and development investment has long been considered to be a critical factor in enabling productivity growth in an agricultural sector. The estimated rates of return associated with RD&E investment continue to be relatively high despite the uncertainty of the empirical relationship between RD&E investment and agricultural productivity growth.

» *OECD Producer Support Estimate*

Globally, the agriculture sectors of national economies have traditionally been subject to a wide range of government regulations and support measures. The methodology developed by the OECD combines the value of trade restrictions, government subsidy programs and indirect payments to farmers (through tax concessions etc.) into a single value, termed the Producer Support Estimate. The Producer Support Estimate is expressed as the estimated value of government support measures as a percentage of average annual farm receipts.



An agricultural competitiveness dashboard case study

In order to further consider the usefulness of this dashboard approach to comparisons of agricultural competitiveness, a case study analysis was carried out involving a comparison between the agriculture sectors of the USA and Australia. Details are included in the full report.

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» *Future potential actions which could be considered include:*

1. Further development of a dashboard of key indicators could be valuable, especially in light of challenges experienced by agricultural sectors globally.
2. To the extent that it is feasible, the Australian Government could provide support steps to improve the quality and comparability of international agricultural statistics.
3. A focus on improving the availability and quality of agricultural statistics is key to the development of meaningful assessments of competitiveness of Australian agriculture.
4. Internationally, there appears to be merit in encouraging relevant agencies to become involved in further developing and refining comparisons of international agricultural competitiveness.

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METHOD

The research initially involved desktop analysis of available literature on competitiveness, including several internationally published competitiveness indexes. Subsequent research involved the design of a trial national competitiveness index, and the collection and collation of relevant agricultural statistics.

Analysis was then carried out to ascertain the extent to which the trial national agricultural competitiveness index accurately reflected national agriculture sector performance for seven different nations. The research then involved further analysis to identify and quantify a small number of high level agricultural sector indicators that may be of use as part of a dashboard to be used to better understand national agricultural competitiveness.

This research was conducted by the following researchers:

Mick Keogh, Adam Tomlinson and Mark Henry.



The Rural Industries Research and Development Corporation (RIRDC) invests in research and development to support rural industries to be productive, profitable and sustainable. RIRDC's National Rural Issues program delivers independent, trusted and timely research to inform industry and government leaders who influence the operating environment of Australia's rural industries.

This research:

- Informs policy development and implementation
- Identifies future opportunities and risks
- Covers multiple industries and locations

RIRDC invests approximately \$1 million per annum in the National Rural Issues program and attracts other investment and partnerships to undertake research that supports cross sectoral and national decision making. From 2015, RIRDC will host an annual Agricultural Policy Roundtable to identify emerging opportunities and issues that independent, trusted and timely research could contribute to.

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Full report

This document provides a summary of the findings and approach used in the development of *Assessing the competitiveness of Australian agriculture*. A separate full report document has been prepared with the details of the analysis undertaken in the project and is commended to the reader for further information in support of the issues outlined in this document

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