Australian agricultural productivity growth

Past reforms and future opportunities

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Summary

There is widespread recognition of the importance of increasing agricultural productivity sustainably. Globally, agricultural productivity growth will enhance the long-term welfare and income of many in rural areas and help address food security issues. Australia’s ability to make the most of opportunities presented by future growth in global food demand depends on maintaining competitiveness through productivity improvements.

Domestic policy settings are important determinants of agricultural productivity because they shape farmers’ incentives and capacity to innovate and improve productivity. The Organisation for Economic Co-operation and Development (OECD 2013a) is developing a questionnaire for countries to use in reviewing agricultural and economy-wide policy settings, to help countries identify policy incentives and disincentives affecting innovation in agriculture. The questionnaire will also provide a basis for cross-country comparisons and will inform best-practice policy-making to increase agricultural productivity.

Australia is one of three countries participating in the OECD’s pilot country reviews of the questionnaire. For Australia, the pilot is an opportunity to consider how past agricultural and economy-wide reforms have contributed to its agricultural productivity growth. It also provides an opportunity to consider the scope for future reforms to promote further growth.

Historically, Australian governments have employed a range of agricultural policy measures to maintain and stabilise farmer returns, including marketing and price support schemes and subsidies to reduce input costs. However, these assistance measures distorted resource use across farms and weakened farmers’ incentives to find better ways of managing risk and to improve productivity. Moreover, government assistance served to offset ‘normal’ adjustment pressures, impeding ongoing structural change and preventing more efficient farmers from expanding their operations.

Recognising this, the Australian Government and state and territory governments have largely reformed market interventions to the point where the level of agricultural producer support is currently the second lowest in the OECD area. These reforms have reduced the disparities in assistance that were encouraging inefficiencies in resource use across farms. The gains from reducing these inefficiencies (‘resource reallocation effects’) have made an important contribution to productivity growth, particularly in dairy and broadacre agriculture (extensive grain and livestock production). At the same time, reform and structural adjustment in agriculture were facilitated by economy-wide reforms that provided a more favourable enabling environment.

However, past reforms that made decision-making in Australian agriculture more responsive to market forces have largely run their course. Further effort to remove price distortions and increase exposure to competition is likely to yield minimal productivity gains. Instead, future opportunities for government to promote agricultural productivity growth may come from reducing regulatory burdens, improving the efficiency of the rural research, development and extension system, and building human capital through improving labour availability and skills. There is also scope to better align incentives under drought programs to facilitate more efficient resource use across farms.
Introduction

Globally, policy makers recognise the importance of increasing agricultural productivity sustainably, since it will enhance long-term welfare and income for many in rural areas and, in particular, it will assist in addressing food security issues. In turn, this recognition has focused attention on the opportunities for governments to promote productivity growth, including through increasing innovation in agriculture. In this respect, the OECD has emphasised the importance of economy-wide and agricultural policy settings in creating conditions conducive to innovation. In particular, it has underscored the innovation policy in ensuring an efficient and effective agricultural innovation system.

To this purpose, the OECD is developing a wide-ranging questionnaire for countries to use in analysing national approaches and best policy practices to increase innovation and productivity growth in agriculture (OECD 2013a). As pilot countries, Australia, Brazil and Canada are reviewing the suitability of the questionnaire as a framework to examine policy incentives and disincentives that affect innovation in agriculture. The feedback will provide a basis for refining a framework suitable for conducting cross-country comparisons and informing ‘best-practice’ policy-making to increase agricultural innovation, productivity and sustainability.

Over the past three decades or so, a key feature of Australia’s approach to improving productivity has been to deregulate agriculture and reduce distorting producer support. Historically, governments employed a range of support measures to maintain and stabilise farmer returns. However, recognising the sectoral and economy-wide costs of such assistance, successive Australian governments have largely withdrawn from such interventions. Australia’s total level of producer support is now the second lowest in the OECD, at 3 per cent of gross farm receipts.

This report describes the key reforms and considers how changes to Australia’s agricultural and economy-wide policy settings have contributed to agricultural productivity growth. In particular, inefficiencies due to distortions in resource allocation within agriculture were potentially very significant, due to wide disparities in levels of assistance across industries. Removing this source of inefficiency is likely to have contributed significantly to agricultural productivity growth.

The report concludes by considering opportunities for government to promote innovation and productivity growth in agriculture. Agricultural industries in Australia face a number of pressures that may constrain their capacity to realise ongoing productivity improvements, sustainably, including:

- relatively high production costs, in particular, labour costs
- costs arising from unnecessarily burdensome regulation
- natural resource pressures associated with climate change
- shifts in societal expectations regarding technology, the environment and animal welfare outcomes.

At the same time, the sector is currently affected by a high exchange rate and adjustment pressures across the economy, driven by the resources boom and Australia’s historically high (national) terms of trade. In particular, the higher cost of Australian agricultural exports and
domestic cost pressures due to increased competition for inputs, such as labour, have reduced agricultural competitiveness. In this respect, it is timely to consider what more could be done to promote innovation and productivity growth in agriculture.

In the first instance, a consolidated framework identifying the main factors that influence productivity is proposed, which aims to draw attention to the main types of factors influencing agricultural productivity and their policy linkages. The framework provides space for all items in the OECD’s questionnaire but gives focus to the range of policy and external influences that shape the rural economic and policy environment and, in turn, that are conducive to on-farm innovation and productivity growth. It also aids in identifying constraints, or initiatives likely to promote agricultural productivity growth and innovation. Figure 1 summarises the main types of influences, distinguishing between:

- factors that are a direct outcome of decisions made by farm businesses
- wider economy and agriculture-specific policy influences
- factors that are external to the policy and farm production environment.

**Determinants of productivity growth**

At the farm level, an improvement in productivity reflects farmers producing more outputs (such as livestock and crops) from market inputs (land, labour, capital, materials and services). Measured at the industry level, productivity growth also reflects changes in industry structure, including the exit of less efficient farmers and more efficient resource use across farms.

Innovation is the main driver of farm-level productivity growth, as farmers reduce costs by adopting more efficient technologies and management practices. Forthcoming ABARES research finds that as the relative prices of farm inputs change over time, profit-maximising/cost-minimising farmers opt for lower-cost input combinations. This practice gives rise to substitution and income effects which, in the latter case, contribute to productivity growth from input saving. While some farmers may choose to produce the same output with fewer inputs, others may increase inputs and production—in some instances, through expanding farm size to further exploit the benefits from increasing returns to scale (Sheng et al. 2014). Farmers may also improve productivity by realising cost savings associated with changes in management and output mix (gains from specialisation and scope economies).

Farm and farm manager characteristics are also important determinants of productivity growth, insofar as they condition the extent to which farmers are able to innovate. These include characteristics associated with their capacity to innovate, such as experience, education and training, financial status and attitude towards risk. The relative importance of profit and non-profit objectives may also play a role.
Figure 1 Framework of major productivity determinants

Agricultural industry productivity growth
- structural adjustment (including exits by inefficient farms)

Farm productivity growth
Innovation
- build capacity to innovate
- improve willingness to innovate

Cost minimisation
- adopt lower cost inputs
- adopt lower cost management practices (including specialisation)
- reduce unit cost of fixed inputs (economies of size and scale)
- reduce unit cost of outputs (economies of scope)

Rural economic and policy environment

Policy opportunities for agriculture
Sharpening incentives
- promoting competition
- removing price distortions
- liberalising world agricultural markets

Improving operating flexibility
- eliminating unnecessary regulation
- setting appropriate regulatory standards

Building capabilities
- investing in R&DE and an efficient agricultural innovation system
- building human capital
- developing infrastructure

Broader policy influences
- macroeconomic stability & settings
- microeconomic reform
- openness of economy
- quality of institutions

External factors
- terms of trade
- consumer preferences
- community attitudes & values
- resource qualities
- seasonal conditions
At an industry level, ongoing resource reallocation is an important source of productivity gains. This largely takes place between existing farms of differing productivity levels, but also as a result of farms entering and exiting agriculture. In particular, exits of less efficient farm businesses release scarce resources for use by more efficient farms, which are able to expand and increase productivity, increasing the efficiency of resource use in agriculture as a whole.

Broader policy influences from across the economy are also important in creating conditions conducive to productivity growth. Factors such as macroeconomic settings and stability, and the broader institutional architecture (such as the rule of law; workplace bargaining arrangements; corporate governance; science, technology and innovation systems; and education and training systems) affect farmers’ costs of production and costs of doing business, and shape economic capabilities. For example, openness to trade and investment can increase the transfer of knowledge and technology between countries and, in effect, facilitate access to the outputs of foreign research and development (R&D). In addition, agricultural productivity growth may depend on the extent to which domestic policies distort or facilitate resource reallocation and adjustments in the structure of production in an economy.

The framework also points to agricultural policy areas with potential to influence agricultural productivity growth in the long term. These include building capabilities, including through investing in R&D (to increase the supply of innovations), education and training (to increase farmers’ capacity to innovate) and extension services (to increase capacity and willingness to innovate). Decision-makers can also promote productivity growth by ensuring policy settings do not distort farmers’ incentives or impede ongoing resource allocation in the sector, through continued micro-economic reform of agricultural input and output markets, and ongoing efforts to reduce unnecessary regulatory burdens.

Other factors that influence productivity are beyond the control of farmers and government. Changing consumer preferences and incomes, resource qualities (such as labour and natural resources) and seasonal conditions can drive profit-maximising farmers to change their input or output mix. The precise effect of various external factors can vary. On the one hand, for example, shifting community expectations and attitudes towards certain farming practices and technologies may present opportunities for product differentiation for farmers deciding to innovate. On the other hand, they may constrain farmers’ capacity and willingness to innovate. Government responses to such concerns can also affect productivity, particularly if policy instruments unnecessarily restrict farm operations.

**Structure of the report**

The report is structured as follows. The following chapter provides an overview of Australia’s agriculture sector, including its contribution to the Australian economy and the productivity performance of the broadacre and dairy industries (where much of the productivity research has been focused). Australia’s agricultural policy reforms, and the wider microeconomic reforms that occurred at the same time, are described next, followed by a discussion of how Australia’s reforms contributed to agricultural productivity growth. The report concludes with a discussion of future opportunities for governments to promote innovation and productivity growth.
Overview of Australia’s agriculture sector

Australia’s agriculture sector comprises a diverse range of industries. Australia has a comparative advantage in extensive broadacre agriculture (essentially non-irrigated crops, cattle and sheep) because of a relative abundance of land. Much of this comprises vast arid and semi-arid regions mostly suited to livestock grazing on native vegetation. Broadacre farms contribute 54 per cent of the gross value of agricultural production and make up around 53 per cent of agricultural businesses (ABARES data). High value horticultural industries also contribute significantly to the gross value of agricultural production, accounting for 16 per cent in 2011–12 (figure 2) (ABS 2012d; ABARES data).

Figure 2 Share of gross value of Australia’s agricultural production, by industry (2012–13)

Australian agriculture has a strong export focus. Around 60 per cent of the gross value of farm production is typically exported, although the share was closer to 75 per cent in 2011–12 (ABARES 2012).

In recent decades, Asia has increased in importance as a destination for Australia’s agricultural production. Asian markets accounted for over 60 per cent of the value of agricultural exports in 2011–12 (ABARES 2012). The main destinations were Japan, China, Indonesia and the Republic of Korea. At the same time, exports to Europe have generally declined and exports to the United States have increased—each accounting for around 10 per cent of the value of Australia’s agricultural exports.

Across the sector, industries differ in the extent to which they depend on export or domestic markets. Some high value industries primarily supply the domestic market. For example, in 2010–11 the horticulture industry exported only 15 per cent of the value of production. In contrast, the broadacre industries are strongly export focused. For example, wheat exports accounted for 67 per cent of the value of production in 2010–11 and almost all of wool production is exported (ABS 2012d).
Australia's agricultural imports are increasing. While Australia remains a significant net exporter of agricultural and food products, over the last 25 years imports have grown at nearly twice the rate of Australia's exports (ABARES 2012). In 2010–11, the value of imported food products was over $11 billion, mostly semi-processed and manufactured products, including seafood, fruit and vegetables, and beverage and malt products. Australia imports more food products from New Zealand than any other country (nearly 20 per cent of all food imports in 2011–12), followed by the United States (around 10 per cent in the same year) (ABARES 2012; ABARES data).

**Natural resources and climate**

The distribution of agricultural activities is largely dictated by several natural resource characteristics: soil type, topography, vegetation and rainfall (ABS 2012d). These define three broad zones: the pastoral, wheat–sheep and high rainfall zones. Large parts of Australia’s landscape comprise the pastoral zone, which is only suited to low-intensity grazing (see map 1). Much of it is characterised by low rainfall, less fertile soils and large area farming of beef and sheep. The principal farming activities in the wheat–sheep zone are winter cropping and livestock grazing. Most of Australia’s sheep flock is run in this zone. Prime lamb and beef production are undertaken in the high rainfall zone. Much of Australia’s dairy industry is found in the coastal areas, along with some dairying in inland irrigation areas.

**Map 1 Australian broadacre zones**

![Map of Australia's broadacre zones](image)

*Source: ABARES*

Climate has a major impact on the agriculture sector’s performance. Most producers rely on seasonal rainfall to support crop and pasture growth, but Australia has one of the most variable climates in the world. As a result, production, particularly cropping, fluctuates considerably. In drought years, agricultural production can decrease sharply (figure 3).
A number of Australia’s agricultural industries depend on irrigation. These have developed around irrigation schemes, particularly in the Murray–Darling Basin (which covers parts of the mainland eastern states as well as South Australia). In 2010–11 irrigated agriculture used less than one per cent of agricultural land in Australia but made up nearly 30 per cent of the gross value of agricultural production. The major irrigated industries, by value, are vegetables, fruit (excluding grapes) and dairy (ABS 2012c).

Figure 3 Impact of drought on the gross value of agricultural production

Note: Chain volume measure, reference year is 2011–12.
Source: ABARES (2012)

Farmers play an important role in managing Australia’s natural resources. Over half of Australia's land is managed by farmers and much of Australia’s remaining native vegetation is found on this land (Harris-Adams et al. 2012). Farming practices can also affect the environment more widely, for example through erosion and flood control and the movement of fertiliser nutrients and farm chemicals into waterways. In general, farmers are increasingly expected to provide ecosystem services as well as produce food and fibre.

Contribution to the economy

Agriculture represents a small but important part of Australia’s economy. The real value of agricultural production was nearly $30 billion in 2011–12, up from around $14 billion at the start of the 1980s (ABARES 2012), and the sector makes a contribution to export revenue around five times its share of gross domestic product (GDP). Farm exports made up over 10 per cent of all goods and services trade in 2011–12 (ABARES 2012). The sector also contributes to employment in related industries—the food product manufacturing industry employed 200,000 people in 2010–11, more than any other manufacturing industry in Australia (ABS 2012d).

The importance of agriculture can also be seen in the direct and indirect effects of drought on the economy. As noted above, the effects of drought on agricultural production can be significant, but the secondary and tertiary effects on the economy can also be important. Widespread drought in 2006–07 is estimated to have decreased economic growth across Australia by around 0.75 percentage points (Penm & Glyde 2007).
Nevertheless, as other sectors have grown the relative importance of agriculture has declined. For the first half of the 20th century agriculture made up around a quarter of the economy and up to 80 per cent of exports (ABS 2012b). However, since the 1980s agriculture has accounted for around 2–3 per cent of gross domestic product. Over time, services have become increasingly important in the economy. In terms of exports, non-farm goods, predominantly from the resource sector, have grown significantly (figure 4).

Figure 4 Farm goods as a share of exports, by period

Productivity performance

Productivity growth has been central to the continued viability, and competitiveness, of Australian farm businesses. Over time productivity growth helped maintain farm profitability in the face of a declining trend in the terms of trade (output prices relative to input prices) and has driven output growth in Australia. For example, analysis of the performance of the broadacre and dairy industries shows that productivity has driven output growth, with declining input use in both industries (table 1).

Table 1 Average input, output and total factor productivity growth in the broadacre and dairy industries (% a year)

<table>
<thead>
<tr>
<th>Industry</th>
<th>Period</th>
<th>Input growth</th>
<th>Output growth</th>
<th>TFP growth</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broadacre</td>
<td>1977–78 to 2010–11</td>
<td>–0.9</td>
<td>0.1</td>
<td>1.0</td>
</tr>
<tr>
<td>Dairy</td>
<td>1978–79 to 2010–11</td>
<td>–0.2</td>
<td>1.4</td>
<td>1.6</td>
</tr>
</tbody>
</table>

Note: TFP total factor productivity.
Source: Dahl et al. (2013)

Average productivity growth across all broadacre agriculture (that is, non-irrigated cropping and extensive livestock industries) has been around 1 per cent a year for more than three decades. This has been largely due to reduced input use (–0.9 per cent a year), rather than output growth (0.1 per cent a year).
Trends among individual broadacre industries have varied markedly over time (figure 5). Productivity growth of cropping specialists averaged 1.5 per cent a year between 1977–78 and 2010–11, higher than the rate observed over the same period on farms in the beef (0.9 per cent) and sheep (0.0 per cent) industries. However, following the dismantling of the wool reserve price scheme in 1991, sheep industry productivity has increased at an average rate of 1.4 per cent a year since the mid-1990s (see box 3). The dairy industry has realised average annual productivity growth of around 1.6 per cent since the late 1970s. Productivity growth also varies considerably across farms, industries and regions (Dahl et al. 2013).

Figure 5 Broadacre and dairy industries total factor productivity growth, by period (%)

Notwithstanding decades of growth, recent studies comparing productivity growth rates over the past fifteen years with growth rates over earlier periods suggest that growth has slowed in the broadacre industries, particularly the cropping and mixed crop livestock industries (Hughes et al. 2011; Sheng et al. 2011b) and the agriculture sector more broadly (Nossal & Sheng 2013). Slower growth has been largely attributed to a combination of adverse seasonal conditions and stagnating investment in public agricultural R&D relative to the value of production.
Australia’s experience with policy reform

Over the last 30 years, the economic and policy environment within which farms operate has changed considerably. The Australian economy was gradually transformed by a series of macroeconomic and microeconomic reforms that gained momentum from the early 1980s. By exposing Australian industries to greater international and domestic competition, and ensuring prices reflected actual costs, the reforms aimed to increase national living standards by increasing flexibility and productivity, promoting structural change and improving the competitiveness of firms and industries (Industry Commission 1998).

Australia’s reforms took place at a time when the global economy was becoming more integrated, and as other countries were also initiating economic reforms. However, in contrast to most other countries, Australia also included agriculture in the wider reform process.

Australian agriculture was lightly assisted compared with other sectors, in particular manufacturing, and also compared with agriculture in North America and Europe. Nevertheless, a range of measures were in place to maintain and stabilise farmer returns and to compensate for the costs of assistance provided to other sectors. These included marketing and price support schemes in sensitive industries such as dairy, sugar and tobacco, and subsidies to reduce farm input costs. Coupled with significant differences in rates of assistance across the sector, many industries faced distorted price signals that impeded industry adjustment and efficient resource use.

Since then, Australian governments have largely withdrawn from interventions that distort agricultural product prices and input costs, and Australia’s current level of producer support (as a percentage of gross farm receipts) is the second lowest in the OECD area. This chapter reviews Australia’s agricultural policy reforms, as well as the wider microeconomic reforms that occurred at the same time.

More detailed discussions of Australia’s microeconomic reforms can be found in reports by the Productivity Commission (1999b) and its predecessor the Industry Commission (1998). The following sections also draw on their analysis.

Australia’s economic reforms

It became apparent from the 1960s that many of the policies adopted by Australian governments to pursue social and economic objectives were imposing costs on the economy and constraining income growth. A series of government commissioned reports emphasised the costs of protecting manufacturing industries from import competition, centralised wage determination and government ownership of economic infrastructure. These policies were intended to promote population growth, develop local manufacturing industries and redistribute the gains from natural resources. They had also served to make many parts of the economy inefficient, inward-looking and inflexible, by:

- encouraging a focus on the domestic market as manufacturers sought to counter imports
- discouraging output growth in more efficient industries by raising their input costs directly through tariffs and indirectly through effects on labour costs and access to capital
Australian agricultural productivity growth

ABARES

- discouraging exports from more efficient industries, including export-oriented manufacturing industries (resulting in a continued reliance on relatively volatile agriculture and mining for export earnings)
- encouraging diversification within industries, rather than specialisation in products in which Australian producers were better placed
- allowing poor management and inefficient work practices to develop and become entrenched
- enabling the continued use of out-dated technologies, combined with low innovation and skill development
- fostering a production culture that resisted change and showed weak commitment to improving performance (Productivity Commission 1999b, pp. 10–11).

In 1973 there were initial moves to open the economy and reduce Australia's high rates of tariff protection, with an across-the-board tariff cut of 25 per cent. However, by the early 1980s the continued poor performance of the Australian economy created pressure for more substantial and wider-ranging economic reforms. In order to increase national living standards, the reforms focused on increasing international competitiveness and industry self-reliance, signalling the end of 'made-to-measure' protection for import competing industries and opening the economy. In turn, greater exposure to international competition stimulated further pressure to reduce unnecessary business regulation, improve the efficiency of government business enterprises and increase the flexibility of capital and labour markets (Industry Commission 1998).

In all, a series of reforms over the 1980s and 1990s encompassed changes in monetary and fiscal policies, capital markets, trade barriers, industry assistance, taxation, corporatisation and privatisation of government business enterprises, business regulation, labour markets and industrial relations, competition policy, new regulatory arrangements for natural monopoly utilities, and innovation and training (Productivity Commission 1999b; Wonder 1995). (More detail on key reforms and policy developments since 1983 can be found in the appendix.)

Snapshot of agriculture before reform

Historically, Australian government interventions in agriculture were largely concerned with improving farmers' welfare and increasing production and exports to earn foreign exchange. In the 1950s Australia faced a balance-of-payments constraint to growth under fixed exchange rates and relied heavily on broadacre agriculture (and mining) exports to earn the foreign exchange needed to finance development objectives (Productivity Commission 1999b). Australia's policy of developing the manufacturing industry through import replacement further increased this reliance, by encouraging local industries to focus on the domestic market.

Other interventions aimed to stabilise and maintain farmers' incomes. In particular, domestic pricing arrangements (often supported by import controls) were used to stabilise prices and farmer incomes against volatile world prices and to maximise export returns. Assistance was also provided as compensation for the effects on farm input costs of protecting manufacturing industries from import competition (Martin 1989). For example, farmers were penalised by tariffs on materials and plant and machinery, and faced higher wage and finance costs (Productivity Commission 1999b).
Overall, producers received assistance through a wide range of measures (Industry Commission 1995; Wonder 1995), including:

- marketing and price support in sensitive industries, including home consumption price schemes for dairy, wheat, sugar, tobacco and dried vine fruits; export price underwriting for wheat; and a reserve price scheme for wool
- tariffs on citrus, dried vine fruits, wine grapes, vegetables and tobacco
- income tax concessions
- research funding
- assistance to inputs, including a fertiliser subsidy, concessional credit and an agricultural tractor bounty
- drought assistance (through Natural Disaster Relief Arrangements)
- assistance arising from under-priced infrastructure services, for example irrigation services (Industry Commission 1992).

**Recognition of the problems with assistance to agriculture**

Increasingly the sectoral and economy-wide costs of assistance to agriculture caused stakeholders to also question the effectiveness and efficiency of many agricultural policies.

In the first instance, most assistance measures were not an effective means to improve producer welfare. Larger producers gained the most from input subsidies and market price supports, and the expected benefits of assistance were usually capitalised into land values, providing a one-off gain to landowners. There was also evidence that assistance benefited non-farm industries. For example, transport and feed sectors captured fodder subsidies provided through drought support through higher prices (Wonder 1995).

The effects of domestic pricing arrangements on efficiency were also recognised, even as they increased in importance as a form of assistance during the 1970s and 1980s (Martin 1989). Home consumption price schemes transferred income from domestic consumers and users (mainly food processors) to producers by raising domestic prices and paying producers an average of the domestic and export prices. By increasing costs for domestic consumers and users, the schemes reduced domestic consumption and welfare relative to export or import parity prices and contributed to raising costs levels generally (Industry Commission 1995). In 1988–89, statutory marketing arrangements and associated measures (such as tariffs) taxed domestic consumers and users by around $550 million (Industry Commission 1991).

The structure of assistance was also distorting resource allocation across the sector. Rates of assistance varied considerably, from little or no assistance for most broadacre crops (excluding wheat) to substantial assistance for tobacco, milk production, eggs, citrus, wine grapes and dried vine fruits (Industry Commission 1995). This encouraged resources to move from lightly assisted and more efficient industries into supported ones, based on expectations about the returns that could be earned under the assistance scheme, rather than price signals in world markets (Wonder 1995). Inefficiencies due to distortions in resource allocation within agriculture were potentially very significant.

Finally, it was becoming clear that agricultural policies and assistance measures were distorting farmers’ incentives to find better ways of managing risks and to improve productivity more
generally. The way in which many domestic marketing schemes were implemented reduced incentives to improve productivity by differentiating production. In particular, compulsory statutory marketing arrangements prevented farmers from searching out new markets that would yield more than average returns (Productivity Commission 2000). And since drought was defined as a natural disaster, farmers received assistance automatically, including carry-on finance at concessional interest rates and subsidies for the purchase and movement of stock, fodder and water. By insulating farmers from the effects of drought, these measures discouraged self-reliance and distorted incentives to implement strategies to manage climate risk and prepare for drought (Wonder 1995).

Agriculture sector reforms

Reform of Australia’s agricultural policies began in the early 1970s, when governments sought to limit the amount of financial assistance provided through budgetary measures. Although agriculture was lightly assisted compared with other sectors, the costs of assistance were mainly borne by domestic consumers and—when subsidies were required to support guaranteed export prices or compensate for high farm input costs—taxpayers (Wonder 1995). Early reforms replaced ‘guaranteed’ prices with ‘stabilised’ prices in the wheat and dried vine fruits industries and placed a greater emphasis on providing adjustment assistance (Industry Commission 1998).

Subsequent reforms aimed to make decision-making more responsive to market forces, and progressively reduced the level and narrowed the differences in rates of assistance across the sector. Agriculture was part of the economy-wide reforms of the 1980s, including the phased reduction in tariff and other border protection measures announced in 1988. By 1995 all such assistance was removed for barley, cotton, fresh horticultural products, grain legumes, maize, tobacco, meat, oats, oilseeds, rice, sorghum, wheat and wool. Tariffs were progressively phased down or out in other industries (dairy, dried vine fruits, sugar and wine). The fertiliser consumption subsidy was also removed in 1988 (Industry Commission 1998).

Scrutiny of Commonwealth and state agricultural marketing arrangements increased in the 1980s. Reforms aimed to increase reliance on market forces and to remove impediments to efficient marketing of commodities, resulting in the dismantling of some statutory marketing authorities (SMAs) (Industry Commission 1998). During the 1990s and 2000s, SMAs and their enabling legislation came under the purview of National Competition Policy (NCP). Under the Legislation Review Program, Commonwealth, state and territory governments had agreed to review legislation that restricted competition, including that which gave the SMAs their monopoly powers to:

- compulsorily acquire (vest) an entire crop
- regulate the quality or price of a commodity
- act as the single-seller in either, or both, domestic and export markets (Productivity Commission 1999a).

Further, NCP extended the competitive conduct rules of the Trade Practices Act 1974 (now the Competition and Consumers Act 2010) to all businesses, including SMAs which had previously been exempt. As a result of these reforms and reviews, all Commonwealth and the majority of state SMAs have been dismantled, except for the New South Wales Rice Marketing Board and the Potato Marketing Corporation of Western Australia (box 1).
Box 1 Reforms to agricultural marketing arrangements

Since the 1970s, competition has been gradually introduced into most agriculture industries where compulsory agricultural marketing arrangements had governed processes between the farm and (either or both) domestic and export markets. Key reforms include:

<table>
<thead>
<tr>
<th>Decade</th>
<th>Commodity</th>
<th>Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1970s</td>
<td>Wheat</td>
<td>Move from guaranteed to stabilised prices; provision for ‘grower to buyer’ sales outside the pooling arrangements; home consumption price limited to wheat for human consumption and determined by a formula to take account of export prices.</td>
</tr>
<tr>
<td>1980s</td>
<td>Dried vine fruits</td>
<td>End of price stabilisation arrangements in 1980</td>
</tr>
<tr>
<td></td>
<td>Citrus</td>
<td>Decade-long phase down of tariffs from 30 to 5 per cent, beginning in 1986; state marketing boards amalgamated, reducing geographical barriers to competition.</td>
</tr>
<tr>
<td></td>
<td>Sugar</td>
<td>Queensland Cotton Board deregulated in 1989</td>
</tr>
<tr>
<td></td>
<td>Eggs</td>
<td>Domestic administered price arrangements and export controls terminated by the Commonwealth in the late 1980s</td>
</tr>
<tr>
<td></td>
<td>Cotton</td>
<td>Domestic market deregulated in 1989; grower levy fund introduced to replace the Commonwealth guarantee of Australian Wheat Board borrowing.</td>
</tr>
<tr>
<td>1990s</td>
<td>Barley</td>
<td>Competition gradually introduced into domestic feed and malting barley marketing in South Australia and Victoria from 1998</td>
</tr>
<tr>
<td></td>
<td>Dairy</td>
<td>Phased reductions in market support payments on export of dairy products</td>
</tr>
<tr>
<td></td>
<td>Dried vine fruits</td>
<td>Commonwealth price equalisation levy and statutory equalisation of domestic sales removed in the early 1990s, as was the industry’s exemption from section 45 of the Trade Practices Act (which reduced the scope for collusive price discrimination).</td>
</tr>
<tr>
<td></td>
<td>Horticulture</td>
<td>Underwriting scheme for apples and pears terminated in 1990</td>
</tr>
<tr>
<td></td>
<td>Tobacco</td>
<td>Local Leaf Content Scheme and the Tobacco Industry Stabilisation plan ceased in 1995; withdrawal of vesting powers in 1995</td>
</tr>
<tr>
<td></td>
<td>Sugar</td>
<td>Import tariffs and domestic price supports removed in mid 1997</td>
</tr>
<tr>
<td></td>
<td>Wheat</td>
<td>Australian Wheat Board converted from statutory authority to a grower-owned company in 1999</td>
</tr>
<tr>
<td></td>
<td>Wool</td>
<td>Reserve Price Scheme ceased in 1991</td>
</tr>
<tr>
<td>2000s</td>
<td>Dairy</td>
<td>State-based controls over sourcing and pricing of market milk ceased in 2000; 9-year Dairy Industry Adjustment Package (DIAP) concluded in 2009</td>
</tr>
<tr>
<td></td>
<td>Barley</td>
<td>South Australian single-desk arrangements terminated in 2007; Western Australian market deregulated in 2009 (allowing any number of licensed entities to export barley)</td>
</tr>
<tr>
<td></td>
<td>Canola</td>
<td>Exports of canola and lupins deregulated in Western Australia in 2009 (traders no longer required to apply for licenses to export)</td>
</tr>
<tr>
<td></td>
<td>Sugar</td>
<td>Queensland Sugar Limited lost its compulsory acquisition powers in 2006 and lost exemption from the Trade Practices Act in 2009</td>
</tr>
<tr>
<td></td>
<td>Wheat</td>
<td>Bulk exports deregulated in 2008, meaning proposals to export bulk wheat no longer needed approval from the single-desk seller (Australian Wheat Board)</td>
</tr>
<tr>
<td>Ongoing</td>
<td>Rice</td>
<td>NSW Rice Marketing Board still retains powers to vest, process and market all rice produced in NSW (around 99 per cent of Australian rice is produced in NSW)</td>
</tr>
<tr>
<td></td>
<td>Potatoes</td>
<td>Western Australian Potato Marketing Corporation still controls the supply of fresh table potatoes in that state</td>
</tr>
</tbody>
</table>

Other reforms from the 1990s onwards also encouraged greater market responsiveness, risk management and self-reliance. In particular, the 1990s saw a major shift in focus for drought policy in Australia. In 1992 the Australian, state and territory governments committed to a new National Drought Policy (NDP). This was a response to widespread recognition that drought is part of farmers’ normal operating environment in Australia and that previous measures treating drought as a natural disaster were poorly targeted and created disincentives for farmers to prepare for drought (Keogh et al. 2011; Wonder 1995). Subsequent NDP reviews and reforms have also emphasised increasing farm preparedness and providing social support for farming families and rural communities, rather than providing farm business support (see box 2). A detailed list of agricultural reforms to the late 1990s can also be found in Industry Commission (1998).

Box 2 Drought policy reform

<table>
<thead>
<tr>
<th>In 1992 the Australian, state and territory governments committed to a new approach to managing drought, the National Drought Policy (NDP), having recognised the disincentive to self-reliance and effective risk-management created by drought relief measures. The policy objectives were:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• to encourage primary producers and other sections of rural Australia to adopt self-reliant approaches to managing climatic variability</td>
</tr>
<tr>
<td>• to maintain and protect Australia’s agricultural and environmental resource base during periods of extreme climate stress</td>
</tr>
<tr>
<td>• to ensure early recovery of agricultural and rural industries (including the fishery and forestry industries), consistent with long-term, sustainable levels (Productivity Commission 2009b).</td>
</tr>
<tr>
<td>While this meant that drought would no longer be regarded as a natural disaster, the policy still operated on the basis that some rare and severe droughts could not be managed and prepared for by even the most prudent farmer (Productivity Commission 2009b). Support measures would be provided to farmers in those areas experiencing an ‘exceptional circumstances’ (EC) event. To be EC-declared, a drought event had to:</td>
</tr>
<tr>
<td>• be rare and severe—that is, it must not have occurred more than once on average in every 20 to 25 years and must be of a significant scale</td>
</tr>
<tr>
<td>• result in a rare and severe downturn in farm income over a prolonged period of time—that is, greater than 12 months</td>
</tr>
<tr>
<td>• not be predictable or part of a process of structural adjustment (in Keogh et al. 2011).</td>
</tr>
<tr>
<td>The existing Rural Adjustment Scheme was modified to reflect the policy focus of the NDP. The scheme was an existing vehicle for structural adjustment policy, aiming to help farmers with a profitable future to grow and unviable farmers to exit agriculture. The key features of drought programs from the early 1990s were:</td>
</tr>
<tr>
<td>• access to concessional credit, later known as the Exceptional Circumstances Interest Rate Subsidy</td>
</tr>
<tr>
<td>• rolling back of transaction-based assistance (such as fodder and stock freight subsidies)</td>
</tr>
<tr>
<td>• family support payments and Exceptional Circumstances Drought Relief Payments</td>
</tr>
<tr>
<td>• an income smoothing scheme, later known as the Farm Management Deposit scheme</td>
</tr>
<tr>
<td>• re-establishment grants (Keogh et al. 2011; Productivity Commission 2009b).</td>
</tr>
<tr>
<td>These arrangements remained in place (largely unchanged) until the late 2000s, despite several reviews of drought policies during the 1990s and 2000s. A recurring finding in these reviews was that interest rate and transaction-based subsidies should be phased out and that greater emphasis should be given to programs that encouraged farmer preparedness (see table 4.1 in Productivity Commission 2009, p. 88).</td>
</tr>
<tr>
<td>However, by 2008, EC arrangements were acknowledged as being no longer appropriate. The Australian Government commissioned a National Review of Drought Policy, which assessed the economic, social and climatic aspects of drought and drought policy. In particular, the findings in the economic assessment reiterated those of earlier reviews—that the NDP’s EC declarations and related drought assistance programs do not help farmers improve self-reliance, preparedness and climate change management. More specifically:</td>
</tr>
<tr>
<td>• EC interest rate subsidies and state-based transactions subsidies are ineffective and can perversely encourage poor management practices</td>
</tr>
<tr>
<td>• EC household relief payments are limited to those in drought-declared areas, ignoring hardship elsewhere or for other reasons</td>
</tr>
<tr>
<td>• the EC declaration process is inequitable and unnecessary (Productivity Commission 2009b).</td>
</tr>
</tbody>
</table>
In response to these and other findings, the Australian and Western Australian governments conducted a pilot of drought reform measures in parts of Western Australia. The pilot trialled reforms focused on farm preparedness and social support for farming families and rural communities.

Following the National Review of Drought Policy in 2008–09 and the two-year pilot of drought reform measures in Western Australia, a new national package of drought programs was announced, to be implemented from 1 July 2014. This was the outcome of an Intergovernmental Agreement on National Drought Program Reform between the Australian, state and territory governments. The package comprises:

- a farm household support payment
- continued access to Farm Management Deposits and taxation measures
- a national approach to farm business training
- a coordinated, collaborative approach to the provision of social support services
- tools and technologies to inform farmer decision-making (SCoPI 2013).

Importantly, the new drought policy package does not include the national EC Interest Rate Subsidy, which was closed on 30 June 2012. This decision was based on the findings of successive drought policy reviews that the subsidy was ineffective and could result in farm businesses being less responsive to drought conditions (Ludwig 2012).

Current agricultural policies

Australia’s level of producer support (PSE) is now the second lowest in the OECD (3 per cent of receipts in 2010–12, down from 10 per cent in 1986–88). As a share of PSE, support that is most distorting has also declined from 87 per cent in 1986–88 to 6 per cent in 2010–12 (figure 6). This decline reflects reduced payments made under the Exceptional Circumstances Interest Rate Subsidy. Australia no longer provides any market price support to producers (OECD 2013b), although some sensitive items (for example, cheese, certain vegetables, certain oils and fats) continue to receive tariff protection, and tariff-rate quotas affect certain types of cheese. The average level of most favoured nation tariff protection for agriculture is a negligible 1.4 per cent (WTO 2011).

Figure 6 Estimates of support to agriculture

Note: PSE producer support estimate.
Source: OECD (2013b)
Other programs provide targeted support directed at improving producers’ ability to manage different production risks in agriculture. Most of these take the form of grants aimed at helping producers improve productivity and efficiency, facilitate structural adjustment, adapt and adjust to climatic change, and improve environmental management of natural resources (see table 2).

Table 2 Key Australian Government agricultural programs

<table>
<thead>
<tr>
<th>Program</th>
<th>Elements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Funding for rural research and development</td>
<td>The Australian Government has a range of programs, spread across several departments, which provide funding for rural R&amp;D (R&amp;D for the agricultural, fishery and forestry industries). The Australian Government invests around $715 million in rural R&amp;D annually.</td>
</tr>
<tr>
<td>Biosecurity</td>
<td>The Australian Government Department of Agriculture primarily manages biosecurity risk at the border and offshore. This involves inspecting vessels, goods and passengers as they enter Australia, and assessing risks posed by proposed import of goods, including plants, animals and their products. While the Quarantine Act does not provide powers for the Australian Government to manage post-border pests and diseases in general, it does allow the Australian Government to play a role during emergency situations.</td>
</tr>
<tr>
<td>Drought-related programs</td>
<td>Assistance provided to farmers under drought programs aims to help farmers prepare for and manage the effects of drought and other challenges.</td>
</tr>
<tr>
<td>Rural Financial Counselling Service</td>
<td>Provides free financial advice for primary producers, fishers and small rural businesses experiencing financial hardship.</td>
</tr>
<tr>
<td>Transitional Farm Family Payment</td>
<td>Provides payments to farmers experiencing significant financial hardship, paid at a fortnightly rate equivalent to the Newstart Allowance.a</td>
</tr>
<tr>
<td>Taxation assistanceb</td>
<td>A number of special tax measures and concessions are available to primary producers, including:</td>
</tr>
<tr>
<td></td>
<td>• tax averaging across years                                                                eña</td>
</tr>
<tr>
<td></td>
<td>• Farm Management Deposits (allowing farmers to set aside pre-tax income to smooth income across years)</td>
</tr>
<tr>
<td></td>
<td>• ability to access a range of other offsets, deductions and concessions to reduce their assessable income.</td>
</tr>
<tr>
<td>Farm finance initiative</td>
<td>Announced in April 2013, this program aims to support farmers currently struggling with high levels of debt, who nevertheless demonstrate long-term viability. Eligible farmers are able to access short-term (up to five year) concessional loans.</td>
</tr>
<tr>
<td>Carbon Farming Futures and the Carbon Farming Initiative</td>
<td>Programs aim to create opportunities for land managers to enhance productivity, gain economic benefits and help the environment by reducing greenhouse gas emissions. Through the Carbon Farming Futures program, funds are available for research, on-farm demonstration, extension and outreach activities. The Carbon Farming Initiative operates as a voluntary offset scheme to facilitate the sale of carbon credits generated from eligible activities within the land sector to international and domestic carbon markets. It funds eligible on-farm activities that generate carbon credits.</td>
</tr>
<tr>
<td>Caring for our Country</td>
<td>The program aims to protect Australia’s natural environment and sustainability. Farmers and other land managers can apply for funding to undertake projects that improve biodiversity and sustainable farm practices. This includes funding for Landcare, a community-based organisation that has worked to raise awareness and influence farming and land management practices since the 1980s.</td>
</tr>
<tr>
<td>Disaster income recovery subsidy</td>
<td>Provided to assist farms (and other businesses) who experience a loss of income as a result of a disasters such as bushfires and flooding.</td>
</tr>
</tbody>
</table>

Note: a For information on the Transitional Farm Family Payment and Newstart Allowance, see humanservices.gov.au/customer/services/centrelink/transitional-family-farm-payment. b Tax provisions available to primary producers can be found in Keogh et al. (2011, appendix E) and PwC (2011).

Source: Department of Agriculture
The level of producer support varies in any given year, since assistance is generally provided in response to specific conditions and removed when they improve. For example, the level of producer support was relatively higher over the period 2006–08 (5 per cent of receipts) because of higher outlays due to drought (OECD 2013b).

General services make up an increasingly large share of total support to agriculture (over 40 per cent in 2010–12, up from 6 per cent in 1986–88) (figure 7). The majority of general services support is R&D funding and support through inspection services and infrastructure (see OECD 2013c for sources and estimates of support to Australian farmers).

Figure 7 Producer support and general services support as a percentage of total support, by period

Note: PSE producer support estimate. GSSE general services support estimate.
Source: OECD (2013b)

Australia’s rural R&D system contrasts strongly with those in other OECD countries, in that government is the main source of rural R&D funding in Australia. Most of this comes through the Australian Government’s levy matching funding of the rural research and development corporations (RDCs) and as core funding for the Commonwealth Science and Industrial Research Organisation (CSIRO). Funding to universities and other Australian Government programs is also significant (Productivity Commission 2011b).

In 2008–09 total funding was in the order of $1.5 billion (equivalent to about 3.3 per cent of the gross value of production for the agriculture, fisheries and forestry sector in that year). The government share of this total funding was approximately 75 per cent. The Australian Government contributed around two-thirds of total government funding (table 3).

Historically, state and territory governments provided a significant level of extension services in rural industries, often on a producer-specific basis. However, in recent years the funding and delivery of extension has changed considerably, with government agencies reducing direct provision of extension services. This reflects budget constraints, but also adoption of user-pays principles and the view that public extension activities should not crowd out private providers.

In response, private sector investment in extension-related fields has increased, and it appears that the withdrawal of the public sector from this area is being compensated for, at least in areas where private (productivity) benefits dominate. In particular, there has been an increase in the number of private agronomists, farm consultants and input suppliers providing these services, as well as grower groups and some joint public and private investment. In some industries, RDCs
have taken on extension roles formerly provided by state and territory governments. Government agencies are increasingly focusing extension activities in areas that yield public benefits, such as biosecurity and practices to improve on-farm natural resource management (Primary Industries Standing Committee 2011, pp. 35–6).

Table 3 Rural R&D funding, 2008–09

<table>
<thead>
<tr>
<th>Organisation type</th>
<th>Funding ($ million)</th>
<th>Share (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Australian Government</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cooperative Research Centres</td>
<td>63</td>
<td>–</td>
</tr>
<tr>
<td>Core funding for the CSIRO</td>
<td>193</td>
<td>–</td>
</tr>
<tr>
<td>Core funding for universities</td>
<td>118</td>
<td>–</td>
</tr>
<tr>
<td>Research &amp; Development Corporations (RDCs)</td>
<td>218</td>
<td>–</td>
</tr>
<tr>
<td>Other departmental programs</td>
<td>114</td>
<td>–</td>
</tr>
<tr>
<td>Foregone tax receipts arising from R&amp;D tax concession</td>
<td>9</td>
<td>–</td>
</tr>
<tr>
<td>Total Australian Government</td>
<td>715</td>
<td>48</td>
</tr>
<tr>
<td><strong>State and territory governments</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Project-related budget allocations</td>
<td>348</td>
<td>–</td>
</tr>
<tr>
<td>Capital investment in R&amp;D facilities</td>
<td>47</td>
<td>–</td>
</tr>
<tr>
<td>Payments to other funders and suppliers</td>
<td>21</td>
<td>–</td>
</tr>
<tr>
<td>Total state and territory governments</td>
<td>416</td>
<td>28</td>
</tr>
<tr>
<td><strong>Private/industry</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Levy payments provided to RDCs</td>
<td>248</td>
<td>–</td>
</tr>
<tr>
<td>Other (for which a tax concession is claimed)</td>
<td>116</td>
<td>–</td>
</tr>
<tr>
<td>Total private/industry</td>
<td>364</td>
<td>24</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1495</td>
<td>100</td>
</tr>
</tbody>
</table>

Notes: a These data do not include funding from royalties and other intellectual property income (on the basis that these have been generated by past funding from governments and private parties). Also, the data do not include in-kind contributions from the private sector, such as through the provision of land and facilities for experiments. b Only the portion of the budget assigned to rural R&D is included. c Estimated by applying the rural share of total university funding received from contestable sources and the portion of university students studying in agriculture-related areas to the three largest university block grants. d Includes programs aimed at wider issues (such as climate change), programs with no sector-specific focus and any one-off payments. e Includes rural R&D and associated extension funding for programs facilitated within the primary industry department (or its equivalent). Any funding for rural R&D from state and territory government environment departments and the like is not included. f Calculated using tax concession data (including an estimate for concessions claimed for R&D on agricultural chemicals). Also includes payments made to the Australian Animal Health Laboratory.

Source: Productivity Commission estimates (2011b, p. 13)
Contribution of policy reforms to agricultural productivity growth

This chapter discusses how Australia's policy reforms have contributed to agricultural productivity growth. It first describes the mechanisms by which economy-wide reforms and those specific to agriculture have improved productivity. It then draws on ABARES productivity analyses to assess how reforms have driven industry productivity growth, before considering the implications of past reforms for future productivity growth.

Effects of economy-wide reforms

For agriculture, an important outcome of Australia's economy-wide reforms was lower prices for a broad range of farm inputs, including imported machinery, materials (such as fertiliser), labour and infrastructure services (namely electricity, water, communication and transport). These allowed farmers to substitute towards lower cost input combinations, leading to productivity growth through input savings. At the same time, financial sector deregulation helped reduce a key constraint on farmers' capacity to innovate—access to financial resources, including access to credit.

Importantly, the timing of these reforms also meant that farm input costs were falling at the same time as governments implemented reforms to agricultural policies, making it easier for farmers to adjust to reductions in assistance (Anderson et al. 2007).

For example, the initial tariff cut in 1973 and subsequent phased tariff reductions from the late 1980s onwards directly lowered the cost of farm inputs such as farm chemicals and tractors, harvesters and tillage equipment. Tariffs on these inputs had imposed significant costs on the agriculture sector. In 1970–71 the penalties associated with tariffs on materials and plant and machinery amounted to 52 per cent of the total assistance provided to agriculture by tariffs and domestic marketing arrangements (Industry Commission 1995).

Reforms that increased the flexibility of input markets (see appendix) also benefited agriculture, since as an export-oriented sector, agriculture had little opportunity to pass on cost increases to consumers (Martin 1989). For example, agriculture may have gained indirectly from the effects of wage restraint in other sectors due to the 'wages accord' that operated between the government and the unions, which limited wage demands.

Similarly, National Competition Policy (NCP) reforms that reduced rigidities in input markets—or established markets or market-based approaches, such as in the case of natural resources management—facilitated resources moving to higher value uses. In particular, reforms that established water markets and trade (see appendix) encouraged a shift away from crops that used a lot of water for relatively poor returns towards higher value horticultural crops, in addition to delivering improved environmental outcomes (Productivity Commission 2005a).

Agriculture may also have received spillover benefits from NCP reforms of government business enterprises and infrastructure services, including electricity, water supply, communications and transport (Parham 2004). Given the tight margins on many agriculture products, improvements in the efficiency of infrastructure services were important in allowing farmers to contain production costs (Productivity Commission 2005b).
Financial sector reforms meant that farmers were able to access a greater range and variety of lending options to finance innovation (Martin 1989). Although concessional interest rates had made finance available to rural borrowers at less than true market rates, it was rationed. This meant that less finance was available to farmers, who instead had to rely on farm cash flows to fund investment. Deregulation removed restrictions on the entry of new banks as well as the requirement that banks provide concessional interest rates for rural loans. Although capital accumulation following financial market reforms in the 1980s was subdued by higher interest rates and lower labour prices (following the wages accord), subsequent on-farm investment was enhanced.

**Effects of agricultural policy reforms**

An outcome of Australia’s agricultural policy reforms was that farmers were no longer hampered in their efforts to adjust to changing market conditions by distorted price signals, due to statutory marketing arrangements (SMAs) and output price supports. Eliminating output price support also reduced disparities in rates of assistance across agriculture. This was a source of inefficiency, in that resource allocations reflected returns achievable under assistance schemes, rather than actual or emerging market opportunities. These inefficiencies were potentially very significant. The standard deviation in the effective rate of assistance (by activity or industry) to agriculture—an indicator of the potential for distortions in resource allocation—was very high in the 1970s and 1980s, although its value fluctuated between years (see Industry Commission 1995; Productivity Commission 2001).

In addition, the restrictions introduced by SMAs had reduced incentives to innovate by improving quality or finding new ways of marketing, as farmers were prevented from choosing how, when, at what price and to whom they sold (National Farmers’ Federation 1998). Deregulation of SMAs provided opportunities for farmers to develop new products and find new markets that would yield more than average returns, improving productivity growth through higher value products. It also allowed buyers to seek specialised producers without being constrained by SMA regulations (Productivity Commission 1999a, 2005b).

Moreover, although structural adjustment was occurring across agriculture, government assistance offset adjustment pressures and, in effect, impeded ‘normal’ structural adjustment. As reforms progressed—over many years in some industries, such as dairy, and effectively overnight in others, such as the wool industry—farmers found it profitable to move into more efficient, lightly assisted industries. More efficient farmers were also able to expand by buying-out less efficient farms, as reforms removed incentives to delay adjustment decisions on the expectation of receiving government assistance (Anderson et al. 2007).

ABARES broadacre and dairy industry total factor productivity data provide an insight into the significance of more efficient resource use across farms and structural adjustment—‘resource reallocation effects’—as a driver of industry-level productivity growth.

Comparing trends in industry outputs and input use with average outputs and input use per farm suggests that many farms have expanded by purchasing resources (such as land) released by exiting or downsizing farms (see table 4, figure 8 and figure 9). At the industry level, the broadacre and dairy industries have increased output, despite declines in aggregate input use. In contrast, individual broadacre or dairy farms have, on average, increased outputs by using more inputs.
Australian agricultural productivity growth  

Table 4 Average output, input and productivity growth in broadacre and dairy industries (% a year)

<table>
<thead>
<tr>
<th>Industry</th>
<th>Broadacre industry</th>
<th>Dairy industry</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Average per farm</td>
<td></td>
</tr>
<tr>
<td>Output</td>
<td>0.1</td>
<td>1.4</td>
</tr>
<tr>
<td>Input</td>
<td>-0.9</td>
<td>-0.2</td>
</tr>
<tr>
<td>Productivity</td>
<td>1.0</td>
<td>1.6</td>
</tr>
</tbody>
</table>

Note: Assuming that all farms are identical, the average output and input use per farm are derived by dividing the industry gross output and input series by the number of farms. The broadacre series covers the period 1977–78 to 2010–11; the dairy series covers the period 1978–79 to 2010–11.

Source: ABARES data

Diverging trends in input use at the industry level, and for farms on average, illustrate a trend towards fewer, larger broadacre and dairy farms in Australia. This, combined with output growth at both the industry levels and for farms on average, suggests that farm exits and entries have made a significant contribution to productivity growth. Over time, changes in industry structure and resource reallocation between exiting and entering farms have been an important source of productivity growth in the broadacre and dairy industries.

Figure 8 Broadacre input and output, by average farm and industry, 1977–78 to 2010–11

Sources: ABARES data

As an example, Australia’s dairy industry illustrates how reforms have promoted improved productivity through structural adjustment. The dairy industry has been subject to reform and adjustment schemes since the early 1970s, culminating with the removal of all price support in July 2000. As a result, ongoing structural adjustment has transformed the dairy industry and continues to contribute to industry-level productivity growth.

At the industry level, productivity has grown at an average annual rate of around 1.6 per cent since 1978–79, growing most strongly in the past decade since deregulation (see figure 5). Before deregulation in July 2000, total output of the industry increased as a result of productivity growth as well as growth in total inputs used. Since the removal of industry price supports, industry output and input use have trended downward, with productivity gains.
Australian agricultural productivity growth

occurring as input contracted more rapidly than output. Many smaller producers have exited the industry, and the production share of small operations remaining in the industry has gradually declined (Dahl et al. 2013). In contrast to industry trends, individual dairy farms have, on average, continued to expand, although at a slower rate than in the decades before deregulation (table 5).

Table 5 Dairy input, output and productivity growth, by average farm (%)

<table>
<thead>
<tr>
<th>Period</th>
<th>Input</th>
<th>Output</th>
<th>Productivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>1979 to 2000</td>
<td>2.8</td>
<td>4.4</td>
<td>1.7</td>
</tr>
<tr>
<td>2001 to 2011</td>
<td>1.0</td>
<td>3.1</td>
<td>2.0</td>
</tr>
</tbody>
</table>

Note: a Financial year ended.
Source: ABARES data

Figure 9 Dairy input and output, by average farm and industry, 1978–79 to 2010–11

Preliminary analysis by ABARES provides further insights into the relative importance of resource reallocation effects. A method proposed by Olley & Pakes (1996) can be used to measure the gains from the reallocation of resources due to farms exiting and entering broadacre agriculture, and due to resources moving between farms with differing levels of productivity. Annual industry-level broadacre productivity growth was decomposed into average on-farm productivity growth, measuring changes in on-farm efficiency, and resource reallocation effects, measuring changes in how efficiently the broadacre industry as a whole is using available resources (capturing the effects of more efficient resource use across farms, as well as the effects of farms exiting and entering broadacre agriculture) (table 6).

Resource reallocation effects have increased in importance over time as a source of TFP growth in broadacre agriculture. Although, resource reallocation slightly detracted from on-farm gains between 1977–78 and 1989–90 (−4.1 per cent a year) as farmers pursued higher profits in less efficient industries, it has subsequently played a major role. Efficiency gains from the reallocation of resources accounted for over a third (34.5 per cent a year) of broadacre TFP growth between 1989–90 and 1999–2000 and two-thirds (66.7 per cent a year) between 1999–2000 and 2009–10, partly offsetting the effects of declining on-farm productivity.
Table 6 Olley-Pakes decomposition of broadacre industry productivity, 1977–78 to 2009–10

<table>
<thead>
<tr>
<th>Period</th>
<th>On-farm growth (%)</th>
<th>Resource reallocation effects (%)</th>
<th>Industry-level TFP growth (%)</th>
<th>On-farm share of TFP (%)</th>
<th>Resource allocation share of TFP (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1978 to 2010b</td>
<td>0.73</td>
<td>0.26</td>
<td>0.99</td>
<td>73.7</td>
<td>26.3</td>
</tr>
<tr>
<td>1978 to 1990</td>
<td>2.03</td>
<td>-0.08</td>
<td>1.95</td>
<td>104.1</td>
<td>-4.1</td>
</tr>
<tr>
<td>1990 to 2000</td>
<td>1.27</td>
<td>0.67</td>
<td>1.94</td>
<td>65.5</td>
<td>34.5</td>
</tr>
<tr>
<td>2000 to 2010</td>
<td>-0.50</td>
<td>0.20</td>
<td>-0.30</td>
<td>-166.7</td>
<td>66.7</td>
</tr>
</tbody>
</table>

Note: a Productivity growth due to resource reallocation effects is measured by the co-variance between changing weights and farm-level productivity growth. b Financial year ended.

Source: ABARES data

A key factor affecting productivity performance between 1989–90 and 1999–2000 was the demise of the Wool Reserve Price Scheme in 1991 (box 3). This led to significant changes in the structure of Australia’s broadacre industries, as many farmers left the wool industry for crop and sheep meat production, characterised by purpose-bred sheep breeds. In the short term, on-farm productivity growth appears to have slowed, as farmers adjusted their enterprises.

Although the analysis also points to declining on-farm productivity over the following decade (1999–2000 to 2009–10), this should not be interpreted as technical regression. Australia experienced poor seasonal conditions over much of the 2000s, which had a significant effect on broadacre productivity. For example, drought is estimated to have reduced the output of mixed crop–livestock producers and cropping specialists by around 11 per cent since 2000 (Hughes et al. 2011). More broadly, figure 3 illustrates the impact of drought on the gross value of agricultural production in Australia.

Even taking recent droughts into account, broadacre productivity growth has slowed. Beyond drought, slow growth in average on-farm productivity also reflects a widening gap between the productivity of the 'best-performing' farms and 'average' farms, notably in the cropping and mixed crop–livestock industries. While farms are generally improving overall, average farms have not been improving at the same rate as the best-performing farms. This widening gap has acted as a drag on productivity growth (Hughes et al. 2011).

One reason may be that some farmers are not undertaking sufficient innovation to maintain past rates of on-farm productivity growth (Nossal & Lim 2011). Innovation depends on farmers having the capacity to adopt and implement innovations and being willing to do so. In this respect, important questions are whether there are characteristics specific to lagging farms or the farm operating environment, or external factors such as the regulatory environment, underlying poor innovation rates. On-farm innovation also depends on the rural research, development and extension (RD&E) system delivering a supply of appropriate innovations 'on the shelf'. These potential constraints on on-farm innovation are explored in the following chapter.
At face value, ABARES total factor productivity estimates suggest that the Australian sheep industry has not improved its productivity between 1977–78 and 2010–11 (0 per cent TFP growth). However, the long-run growth rate obscures strong growth following the collapse of the Wool Reserve Price Scheme (WRPS) in 1991. The WRPS, which operated between 1974 and 1991, aimed to stabilise future large movements in wool prices by purchasing wool that did not achieve the agreed floor price and then selling wool later in times of strong demand. The scheme collapsed in 1991 when low wool demand and high reserve prices (set during a period of high demand in the late 1980s) contributed to the stockpile reaching unsustainably high levels. Following the collapse, many producers left the wool industry or shifted focus to cropping and slaughter lamb production. Consequently, annual wool production fell by more than 50 per cent while slaughter lamb production increased by more than 35 per cent between 1990–91 and 2010–11 (Dahl et al. 2013).

Resultant changes in the composition of the sheep flock and land management practices delivered significant productivity growth. In contrast to other broadacre industries, which have experienced a slowdown in productivity growth over the past decade, sheep industry productivity has increased at an average rate of 1.4 per cent a year since the scheme collapsed; this is in contrast to declines in productivity growth in earlier periods (figure 5). For example, during the 1980s, negative productivity growth coincided with rapid industry expansion in response to strong global demand and rising wool prices.

Other factors have also contributed to increased sheep industry productivity since the collapse of the scheme, including advances in animal breeding and genetics, and improved herd, disease and fodder management. In particular, the strong shift to prime lamb production has been characterised by a higher proportion of ewes in flocks and use of non-merino rams (leading to a higher incidence of twinning). In addition, increased use of improved pasture species and fodder crops has improved ewe fertility and reduced lamb mortality, leading to higher lamb turn-off rates and to higher average slaughter weights (ABARE 2007).
Implications of reforms for future productivity growth

The productivity payoff to Australia’s agricultural policy reforms has been significant, particularly the payoffs to reforms that encouraged greater efficiency in resource use across farms. But those reforms, with their emphasis on making decision-making in agriculture more responsive to market forces, have largely run their course. Although slowing productivity growth—and slow on-farm growth in particular—raises the question of whether some policy settings continue to distort incentives for innovation, the scope and extent of Australia’s market reforms suggests that the majority of distorting measures have been addressed.

The reforms of the past 30 years mean that Australian agriculture is strongly market-oriented. Farmers are exposed to competition in domestic and world markets, and governments have largely removed production- and trade-distorting support. With few exceptions (namely the New South Wales Rice Marketing Board and the Potato Marketing Corporation of Western Australia, see box 1), domestic statutory marketing arrangements and export single-desk arrangements were deregulated, and tariffs and other border protection measures were removed for the majority of agricultural commodities. Reforms dismantling all Australian government SMAs and the majority of state SMAs also introduced competition into agricultural value chains.

The gains from past reforms have also largely been realised, although exposure to competition will continue to provide farmers with an incentive to innovate. Some of the productivity growth attributable to reform may reflect efficiency gains from ‘one-off’ adjustments, which farmers have made in response to changes in the economic and policy environment. Similarly, some resource reallocation effects may reflect resources moving ‘permanently’ out of industries that had previously been in receipt of significant amounts of assistance.

Finally, remaining reform opportunities aimed at removing price distortions and increasing exposure to competition are limited. Governments still provide some support to farmers with the potential to distort efficient investment decisions, particularly subsidies for irrigation infrastructure (OECD 2012), and some sensitive products continue to receive tariff protection. In addition, statutory marketing arrangements are ongoing in some industries, namely rice and potatoes. While further reforms in these areas are, of course, warranted, they are unlikely to yield productivity gains comparable to historical rates of growth.
Future opportunities

With past agricultural reform initiatives and their attendant effects on productivity largely exhausted, it is timely to consider what more governments can do. Future growth in global food demand presents a significant opportunity for Australian agriculture, as populations and incomes increase in key developing economies. While Australia is well placed to meet some of this higher demand (Linehan et al. 2012), the ability of the sector to do so will depend, in large part, on maintaining competitiveness and productivity growth relative to competitors for those export markets.

The framework of major productivity determinants in figure 1 provides a useful starting point. It summarises the range of policy and external influences that shape the rural economic and policy environment, and hence farmers’ incentives and capacity to innovate and improve productivity. It also identifies the channels through which governments can promote or influence farm productivity and structural adjustment within agriculture, and emphasises opportunities that arise within an agricultural policy framework, specifically policies that affect incentives, operating flexibility and capabilities (Productivity Commission 2008a).

In considering possible future initiatives for government, this chapter focuses on potential policy opportunities for agriculture. There is, of course, scope to improve policy settings and institutions across the Australian economy—commentators have warned Australia against complacency in the face of pressure for further reforms and highlighted a number of reform opportunities (for example, Banks 2005, 2012; OECD 2010, 2012; WTO 2011).

Such reforms, if progressed, could also facilitate agricultural productivity growth, to the extent that they reduced farms’ production costs and costs of doing business and facilitate on-farm investment. Here, key areas include taxation, labour markets and infrastructure governance and pricing. However, Australia has made significant progress in many areas (see appendix) and, as a result, institutions and broader policy settings across the economy generally support innovation and productivity growth at the farm level. The focus, therefore, is on opportunities within the agriculture policy framework to sharpen incentives, improve operating flexibility and build capabilities.

Moreover, as discussed in the previous chapter, Australia’s agricultural reforms have largely dealt with support measures that were distorting incentives. Australian agriculture is already strongly market-oriented, and remaining reform opportunities aimed at removing price distortions and increasing exposure to competition may only have a small impact on productivity. On the other hand, there is scope for governments to facilitate efficient resource use across farms by ensuring that incentives under drought and natural resource management programs encourage scarce resources to move to their highest value uses.

The framework (figure 1) points to a number of opportunities to improve operating flexibility and build the capabilities of the agriculture sector.

Among other policy opportunities, the framework underscores the contribution of infrastructure in building the capabilities of the agriculture sector. Economic infrastructure—namely transport, water, energy and telecommunications facilities—is a key input into agriculture, accounting for around 11 per cent of total intermediate input costs in the agriculture, forestry and fishing sector in 2008–09 (ABS 2012a; Nguyen et al. 2013). As a result, infrastructure that is characterised by bottlenecks and/or unreliable service can lower agricultural productivity growth and reduce the competitiveness of the sector.
Agriculture gained from past reforms of infrastructure industries, particularly in telecommunications and transport. However, pressure on the infrastructure currently supporting agricultural supply chains is likely to increase with the potentially significant expansion of Australia’s production and exports of key agricultural commodities. For agricultural industries to take advantage of new export opportunities, Australia’s infrastructure systems must be able to support a growing food industry by moving food cost-effectively and efficiently to markets.

Ongoing ABARES research is assessing future infrastructure requirements to support growth in Australia’s agrifood industry and examining impediments to investment in infrastructure, including private provision of infrastructure (see Nguyen et al. 2013). The following sections consider the remaining four opportunities for government listed in the framework:

- facilitating structural adjustment and efficient resource use across farms
- reducing unnecessary regulatory burdens and setting appropriate regulatory standards
- investing in RD&E and an efficient agricultural innovation system
- building human capital through improving labour availability and skills.

**Facilitating structural adjustment and efficient resource use across farms**

Future productivity growth depends on whether scarce resources, including farm land, labour, irrigation water and other capital, can move freely between farms to higher value uses. Resource reallocation—whether through structural adjustment or, more generally, resources moving between farms—is an important productivity driver at an industry level (see box 4).

**Box 4 Productivity and farm size**

A trend towards larger farms is associated with higher productivity. ABARES has generally found higher productivity among larger broadacre cropping farms (Alexander & Kokic 2005; Kokic et al. 2006; Zhao et al. 2009) and livestock farms (ABARE 2004a, 2004b; Nossal et al. 2008), and the Productivity Commission reports similar trends for intensive livestock industries such as the poultry and pigmeat industries (in Productivity Commission 2005b).

Recent ABARES research has found that large farms achieve higher productivity through changes in production technology rather than through changes in scale (Sheng et al. 2011c). In some industries, technologies may be better suited to larger farms because of the lumpy nature of investment in, for example, cropping machinery and dairy shed technologies. However, in other cases, farm size itself may not be the constraint, if smaller farms do not have the capacity to adopt technologies suited to their size. For example, smaller farms may be constrained by access to skilled labour or available cash flow.

Governments can promote productivity growth by ensuring policy settings do not impede ‘normal’ structural adjustment within agriculture, including exits by inefficient farm businesses.

In Australia, drought and rural assistance programs have tended to hamper, rather than facilitate, structural adjustment. By supporting expectations that governments would assist farm businesses experiencing financial hardship, measures reduced incentives to adjust or exit farming. Where support becomes capitalised into land values, the ‘wedge’ between land values and production may have prevented more efficient farmers from expanding their scale of operations. The recent national review of drought policy recognised that exceptional
Australian agricultural productivity growth

ABARES

circumstances (EC) declarations and related drought assistance programs prevented productivity growth and hindered adjustment, but reform is underway (see box 2).

Of course, a range of non-financial factors can also act to delay structural adjustment. These include inadequate formal recognition of transferable skills and management experience gained while farming and a reluctance to move away from the family home and local community (Productivity Commission 2009b). However, it is important that governments remain committed to reforming drought and assistance programs that distort financial incentives, focusing instead on implementing measures that provide household support and encourage self-resilience and preparedness in managing production and climate risks.

Reducing regulatory burdens

Australian governments have largely withdrawn from interventions affecting agricultural output prices and input costs. However, (non-price) regulation of agricultural inputs has generally increased in recent years, with governments using a range of regulatory arrangements to achieve various efficiency or equity objectives on behalf of the broader community. According to the World Economic Forum (2013) rankings of the burden of agricultural policy costs, Australia’s scores have declined since 2009, suggesting a growing burden on farmers relative to competitors (figure 10).

Figure 10 Country rankings of the burden of agricultural policy costs, 2008–2013

Note: Survey questions asked for responses on the question ‘In your country, how would you assess the agricultural policy? [1 = excessively burdensome for the economy; 7 = balances well the interests of taxpayers, consumers, and producers]’.
Source: World Economic Forum (2013) and earlier reports

Australian Government and state and territory government regulations combine to affect farm business operations at each stage of production. Regulation of agricultural inputs covers aspects of land acquisition, land preparation, cropping and animal husbandry operations, on-farm processing operations, transportation of the product to market, and the marketing and sale of farm products (table 7). An increasingly important area is regulations and standards that respond to community concerns about various aspects of agriculture, such as environmental
sustainability, animal welfare and new technologies. Two issues likely to have ongoing implications for agricultural productivity are:

- moratoria on commercial release of genetically modified (GM) crops, which have prevented farmers from adopting GM crops with regulatory approval, as well as reduced private sector investment in developing GM varieties adapted to Australia's conditions

- community concerns about foreign ownership of agricultural land, agribusinesses and agricultural food production (reported in DAFF 2012a), which may lead to further barriers being placed in the way of foreign investors, reducing the flow of foreign capital into Australian agriculture. Australia is ranked tenth among OECD member countries for the most restrictive on foreign direct investment (FDI) in agriculture (OECD 2013d).

Although some regulations benefit farmers, other regulations, which are unnecessarily burdensome, complex or redundant, can constrain productivity growth and impose heavy costs on farm businesses. This might occur where regulations:

- limit opportunities for farmers to employ innovative or lower cost approaches to meet the intended outcomes of the regulation

- discourage innovation if compliance burdens associated with some regulations create a disincentive for farmers to implement innovations

- reduce the value of farmers’ property rights or constrain land-use options (Productivity Commission 2007).

Over time, changes to farm operating environments can alter the balance of key policy dimensions (such as efficiency, effectiveness, equity and sustainability) and, where the benefits of reform exceed its costs, adjustments to policy settings may be justified. Many factors can skew the original benefit–cost considerations behind regulations, or subsequently lead to unintended consequences, including:

- shifts in societal preferences and attitudes

- emergence of other policy imperatives

- development of more efficient policy instruments

- changes to international policy environments

- changes in markets and technologies

- accumulated interactions between different regulations and jurisdictions.

Even where an existing regulatory objective and approach is still appropriate, more flexible settings can, in some cases, enable farmers to improve productivity and to meet broader community objectives in ways that minimise costs to society as a whole. This is especially relevant where, as noted above, pressure to regulate is driven by negative community attitudes towards specific practices or technologies, or society expects farmers to perform dual roles as providers of food and fibre as well as providers of ecosystem services (Gray et al. 2012).
### Table 7 Agriculture value chain and the impact of regulations

<table>
<thead>
<tr>
<th>Key Australian Government involvement/regulation</th>
<th>Key stages of agricultural cycle</th>
<th>Key state/territory government involvement/regulation</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Aboriginal land rights/native title</td>
<td>acquisition of arable land</td>
<td>• land use and planning regulation</td>
</tr>
<tr>
<td>• environmental protection and biodiversity conservation</td>
<td>preparation of land</td>
<td>• Aboriginal land rights/native title</td>
</tr>
<tr>
<td>• Aboriginal and Torres Strait Islander cultural heritage</td>
<td>farming</td>
<td>• land use and planning regulation</td>
</tr>
<tr>
<td>• natural heritage, world heritage</td>
<td>• cropping</td>
<td>• native vegetation legislation</td>
</tr>
<tr>
<td>• international treaties and conventions covering natural and cultural heritage</td>
<td>• animal husbandry</td>
<td>• water regulation</td>
</tr>
<tr>
<td>• licensing and approval of chemicals, fertilizers and pesticides</td>
<td></td>
<td>• weed and vermin control regulation</td>
</tr>
<tr>
<td>• environmental protection and biodiversity conservation</td>
<td></td>
<td>• laws relating to Aboriginal and Torres Strait Islander cultural heritage, archaeological and Aboriginal relics, sacred sites</td>
</tr>
<tr>
<td>• chemical and pesticide supply and registration</td>
<td></td>
<td>• use of chemicals, fertilizers and pesticides</td>
</tr>
<tr>
<td>• access to drought support</td>
<td></td>
<td>• natural heritage</td>
</tr>
<tr>
<td>• fuel tax regulation</td>
<td></td>
<td>• environmental protection/assessment</td>
</tr>
<tr>
<td>• national pollutant inventory</td>
<td></td>
<td>• building regulations</td>
</tr>
<tr>
<td>• biosecurity regulation</td>
<td></td>
<td>• animal welfare regulation</td>
</tr>
<tr>
<td>• immigration regulation</td>
<td></td>
<td>• transport regulation affecting use of farm machinery</td>
</tr>
<tr>
<td>• water access and regulation</td>
<td></td>
<td>• vehicle and machinery licensing regulation</td>
</tr>
<tr>
<td>• research and development funding and support</td>
<td></td>
<td>• livestock regulation and identification</td>
</tr>
<tr>
<td>• export certificates</td>
<td>on-farm processing</td>
<td>• access to drought support</td>
</tr>
<tr>
<td>• industrial relation regulations</td>
<td></td>
<td>• workplace, health and safety regulation</td>
</tr>
<tr>
<td>• immigration regulation</td>
<td></td>
<td>• fire control regulation</td>
</tr>
<tr>
<td>• environmental regulation</td>
<td></td>
<td>• weed and vermin control regulation</td>
</tr>
<tr>
<td>• industrial relations regulation</td>
<td></td>
<td>• livestock disease control regulation</td>
</tr>
<tr>
<td>• national pollutant inventory</td>
<td></td>
<td>• livestock movement regulation</td>
</tr>
<tr>
<td>• national land transport regulatory frameworks</td>
<td>transport and logistics</td>
<td>• water access and regulation</td>
</tr>
<tr>
<td>• shipping and maritime safety laws</td>
<td></td>
<td>• chemical and pesticide use</td>
</tr>
<tr>
<td>• international maritime codes and conventions</td>
<td></td>
<td>• building regulations</td>
</tr>
<tr>
<td>• competition laws/access regimes</td>
<td></td>
<td>• machinery operations</td>
</tr>
<tr>
<td>• animal welfare</td>
<td></td>
<td>• certification and labelling</td>
</tr>
<tr>
<td>• marketing legislation (mandatory codes and acquisition)</td>
<td>marketing</td>
<td>• industrial relations regulation</td>
</tr>
<tr>
<td>• food safety regulation</td>
<td>• boards</td>
<td>• workplace health and safety regulation</td>
</tr>
<tr>
<td>• quarantine regulation</td>
<td>• customers</td>
<td>• government-owned public/private transport infrastructure</td>
</tr>
<tr>
<td>• export controls</td>
<td></td>
<td>• access regimes</td>
</tr>
<tr>
<td>• export incentives</td>
<td></td>
<td>• interstate certification arrangements</td>
</tr>
<tr>
<td>• WTO obligations</td>
<td></td>
<td>• taxation</td>
</tr>
<tr>
<td>• market access and trade agreements</td>
<td></td>
<td>• taxation</td>
</tr>
<tr>
<td>• taxation</td>
<td></td>
<td>• interstate certification arrangements</td>
</tr>
</tbody>
</table>

Source: Updated from Productivity Commission (2007, pp. 31–32)
For example, in some agricultural areas of Australia, state government regulations that prohibit farmers from clearing native vegetation restrict changes in land use and reduce the efficiency of normal farm-management practices. While such ‘command and control’ approaches can increase the provision of socially valued ecosystem services on private land, they are typically inefficient because of the heterogeneity of the ecosystem services (however assessed) and opportunity costs across rural landscapes. In contrast, greater use of market-based instruments (such as biodiversity tenders) would exploit this heterogeneity and may achieve similar (and, in some instances, potentially greater) levels of ecosystem services at a lower cost to farmers (Davidson et al. 2006; Harris-Adams et al. 2012). While some governments have sought to lower the cost to farmers of seeking approvals to change native vegetation management (such as in New South Wales), there nevertheless remains scope to improve the efficiency with which many states achieve socially acceptable levels of environmental outcomes.

All Australian, state and territory governments have now introduced, or upgraded, regulatory impact systems to improve the scrutiny of new regulatory proposals likely to impose a significant burden on businesses (Productivity Commission 2011a). While these processes help ensure that the flow of new regulation is effective and efficient, it is also important for governments to commit to regular reviews of their stock of regulation, to ensure it remains ‘fit for purpose’ (Gibbs et al. 2013).

A recent ABARES review of a subset of agricultural and forestry regulations identifies some areas where the Australian Government could improve regulation (Gibbs et al. 2013; summarised in box 6). Beyond these discrete policy issues, the review also identified inconsistent regulations across the states and territories as a significant contributor to the burdens on farm businesses. Greater effort to reduce unnecessary regulatory inconsistencies is likely to benefit rural businesses operating in multiple jurisdictions.

Given the very limited scope of the ABARES review, there are likely to be benefits gained from extending review processes across the broad spectrum of (Australian Government and state and territory government) regulation intersecting with agriculture. Strategically and proactively assessing the efficiency and effectiveness of regulation, as well as whether policy objectives are still appropriate, can help ensure that policy settings do not unnecessarily constrain innovation and productivity growth (Gibbs et al. 2013).

The Australian Government has already begun to focus its attention on reducing unnecessary and inefficient regulation through changes to its culture, processes and practices. The Australian Government is currently re-examining its stock of regulation to identify opportunities to reduce the regulatory burden it imposes on businesses, community organisations and individuals. In addition, all Australian Government departments have been tasked with reducing the burden of regulation with a view to improving productivity and profitability across all sectors of the economy, including agriculture.
Box 5 Summary of findings from the ABARES Review of Selected Regulatory Burdens on Agriculture and Forestry Businesses

Under the regulatory reform stream of the National Reform Agenda (see appendix), the Australian Government asked the Productivity Commission to undertake a series of reviews of the burdens on business from Australian Government regulation. The Productivity Commission explored regulatory burdens on primary sector businesses in 2007, finding that, from the perspective of farmers and other primary sector businesses, governments impose a heavy burden of regulation. It recommended removing or reducing Australian Government regulations that are unnecessarily burdensome, complex or redundant, or are duplicated across portfolios or with state and territory regulation (Productivity Commission 2007).

Recently, ABARES re-examined and updated the Productivity Commission’s review under the Agricultural Productivity Work Plan of the Productivity and Regulatory Reform Committee, a subcommittee of the Primary Industries Standing Committee. The ABARES review aimed to identify areas of unnecessarily burdensome regulation which, if improved, could raise productivity in Australia’s rural industries. Specifically, ABARES assessed the effectiveness and efficiency of 20 policy areas covering 32 regulatory issues relating to agriculture and forestry. Its remit was limited to regulatory issues affecting these sectors to which the Productivity Commission (2007) had responded and, in turn, to which the Australian Government had accepted or noted. Following the Productivity Commission’s approach, ABARES did not assess whether the underlying policy objectives were necessarily appropriate.

Current policy arrangements were viewed through the lens of efficiency and effectiveness with their underlying objectives treated as a given. The results suggested that potential future action by the Australian Government to improve regulatory arrangements typically fell within three broad categories:

- further action could potentially reduce unnecessary regulatory burdens
- further action could complement state and territory government efforts to reduce unnecessary regulatory burdens
- no further action required at this stage (beyond ongoing commitments).

ABARES found that further Australian Government action could reduce unnecessary regulatory burdens for 8 of the 32 issues investigated. For these, there is merit in the Australian Government considering additional action to improve current arrangements. In doing so, the next step would be to consider the overall costs and benefits involved in committing to further reform activities. The policy issues are:

- overly prescriptive animal health and welfare requirements of Marine Orders Part 43, relating to the transport of live animals on ships
- the lack of clarity about what constitutes a ‘significant impact’ under the Environment Protection and Biodiversity Conservation Act 1999
- overlap in regulation of live animal imports
- building regulations and the energy efficiency of timber (in particular, the incomplete representation of a building’s energy use over its life cycle under current energy efficiency rating schemes)
- inconsistent taxation of non-resident and resident workers
- inconsistent work health and safety regulation between states and territories
- the cost of and access to permits for minor use of agricultural chemicals and veterinary medicines
- overlap, inconsistency and duplication in agricultural chemical and veterinary medicine regulation across jurisdictions.

While there is a prima facie case for reform in these areas, it is important to note that further analysis is needed to determine the merit associated with potential regulatory changes. In other words, scope for regulatory improvement does not necessarily justify reform activity. Regulatory reform can be costly and its benefits can vary significantly in magnitude and distribution. The implications of further Australian Government involvement and the likelihood of society realising a net benefit require additional consideration.

There is also scope for the Australian Government to consider addressing several cross-jurisdictional issues (4 of 32) by enhancing coordinated action between state and territory governments. While state and territory governments generally have powers to regulate over many matters relevant to rural businesses, the Australian Government often assists in coordinating a national approach, or otherwise supporting their activities. Australian Government involvement typically occurs through the Standing Council on Primary Industries and other intergovernmental bodies.
The four issues identified are:

- genetically modified crops being subject to lengthy and inconsistent pathways to market because of state-based moratorium legislation
- water property rights that are inconsistently defined between jurisdictions
- inconsistency in regulating chemicals of security concern between jurisdictions
- inconsistent food regulation between jurisdictions.

For the majority of issues investigated (20 of 32), ABARES concluded that further action by the Australian Government to reduce unnecessary regulatory burdens was unlikely to significantly improve the productivity of rural businesses. Four broad reasons stood out:

- the regulatory burden is no longer a concern for industry
- major reforms have recently occurred or are planned
- the regulatory burden is solely an issue for state and territory governments
- the regulatory burden is necessary to achieve broader policy objectives.

Source: Gibbs et al. (2013)

Improving the efficiency of the rural RD&E system

Investing in rural R&D policy remains a key part of the Australian Government’s commitment to increasing the productivity, sustainability and resilience of rural industries. A significant proportion of new technologies and management practices driving farm productivity growth are the outputs of public investments in R&D. In turn, public extension activities have facilitated adoption of such innovations by gathering, interpreting and communicating information on the latest technologies to farmers.

Investments by the Australian, state and territory governments in rural R&D and extension have had a significant effect on agricultural productivity. ABARES research found that past investments in broadacre R&D and extension by Australian governments (with the latter mainly provided by state and territory government primary industries departments) have generated internal rates of return that could be as high as 28 per cent and 47 per cent a year, respectively (Sheng et al. 2011a). Other studies examining the return to public investments in R&D and extension in Australia have estimated similar internal rates of return (for example, Mullen 2007; Mullen & Cox 1995).

In addition to innovations generated domestically, Australian agriculture has also benefited from knowledge and technology developed overseas. ABARES research found that spillovers from foreign R&D (proxied by investment from the United States) have accounted for average broadacre TFP growth of around 0.63 percentage points annually (Sheng et al. 2011a). Moreover, the relative contributions of foreign and domestic research (including domestic extension) to broadacre TFP growth have been roughly equal, suggesting that Australian agriculture relies heavily on international research spillovers (figure 11).
Future agricultural productivity growth will depend on the capacity of rural RD&E systems to supply innovations to a diverse sector. Given expanding and competing demands for scarce public funds, a key challenge lies in maximising the payoffs to public investments, to the wider community, while minimising transaction costs across the multiple R&D and extension providers and jurisdictions that comprise the Australian system. At an aggregate level, this also requires finding the optimal balance in allocating scarce funds between competing objectives, including:

- R&D that generates maximum payoffs over the longer run and extension that brings forward farmers’ adoption of currently available innovations

- R&D with a stable, long-run focus versus finite funding directed at a short- to medium-term payoff

- R&D with an on-farm/production focus, an off-farm focus (such as quality and food safety management across value chains, processing innovations, and promotion) or a natural resource management focus

- R&D that is cross-cutting versus commodity-specific.

Commentators have also called for a more appropriate balance between public and private funding. The public sector is the main source of rural R&D funding in Australia, yet the Productivity Commission (2011b) has argued in its review of the rural research and development corporations (RDCs) that government’s funding contribution is likely to have induced only a modest overall amount of additional, socially valuable research. A challenge for Australian agricultural R&D policy lies, in the first instance, in allocating public support in ways that are likely to yield a net payoff to the community (Banks 2012) and, in the second instance, in encouraging greater private investment.

Although the share of rural R&D undertaken by the private sector is increasing, a recent survey of potential private investors in rural R&D raised a number of impediments to increased private funding in Australia (see Keogh & Potard 2011). As assessed by the Productivity Commission
some impediments are not an appropriate target for policy action. This includes the costs of doing research locally and the small size of the Australian market. However, there may be greater scope to address other impediments, such as:

- time consuming and costly requirements for testing and registering new agricultural and veterinary chemicals
- aspects of the arrangements governing the use of genetically modified crops, to the extent that inconsistencies between some state governments’ and the Australian Government's regulation of genetically modified crops are a disincentive to industry investment (Statutory Review Panel 2006)
- particular features of Australia’s intellectual property laws impinging specifically upon rural R&D
- the difficulties for private parties seeking to engage in collaborative research with RDCs and government research suppliers to come to an agreement on ownership of intellectual property rights.

The Productivity Commission also noted that in seeking to encourage additional private investment in rural R&D, it is important that policymakers treat the private sector as an integral part of the overall framework. For example, submissions to the Productivity Commission inquiry into the RDCs suggested that there was little consultation with private companies or individual producers as part of the development of the National Primary Industries RD&E Framework (Productivity Commission 2011b).

In addition, given Australia’s small domestic capacity for R&D relative to larger economies, realising benefits from international collaborations and research spillovers remains a priority. While some organisations, including RDCs (for example, the Grains Research and Development Corporation and Dairy Australia) have developed strong international research linkages, more can be done. For example, in considering opportunities to enhance public extension initiatives, decision-makers could consider the scope for emphasising extension initiatives directed at accelerating foreign knowledge and technology spill-ins, rather than limiting the concept of extension simply to indigenously generated knowledge. At the same time, Australia’s rural RD&E system will need to invest in maintaining sufficient capacity and developing networks to identify, adapt and exploit technologies and knowledge developed outside Australia.

**Labour availability and skills**

The availability of labour, particularly skilled labour, is an important determinant of agricultural productivity growth. ABARES research has shown that farmer educational attainment has a positive and significant impact on farmers’ innovativeness, in terms of the number of new practices or technologies implemented by farm businesses that they are likely to continue using (Nossal & Lim 2011). As farm systems become more complex, farmers will need more advanced skills to better manage risks, and to identify and apply new technologies and management practices. Demand for skilled farm labour will increase as farm businesses seek to capture the benefits of more sophisticated technologies and raise farm capacity for innovation and adoption.

However, labour availability is an issue for many agricultural industries (see IDC 2009). Australia has a small and ageing labour force and high demand for labour across the economy. Although this has provided strong incentives for Australian agriculture to become more efficient in its use of labour (freeing labour for use elsewhere), Australian farm labour inputs have
become relatively more costly than those in key competitors, affecting Australia’s competitiveness. Moreover, although farmers have access to temporary and permanent overseas labour through a variety of programs and visa arrangements (including the Seasonal Worker Program, and working holiday-maker and temporary business visa schemes), continuing concern about labour shortages suggests employers still face challenges in accessing workers through those initiatives.

Significant skills shortages are also expected. Beyond those factors affecting the supply of skilled labour, discussed above, stakeholders have also pointed to lack of emphasis on education and training in the industry, citing low levels of industry participation in vocational education and training, and a lack of time to train, compounded by the need to travel significant distances to and from structured learning activities (among other factors) (see IDC 2009).

Wider labour market reforms are potentially a high priority for Australia (Banks 2011; OECD 2012). Improving flexibility in wage determination and recruitment, and enabling businesses to make organisational changes more easily, could yield productivity improvements for many rural businesses. In addition, improving arrangements around access to overseas labour, including temporary and permanent migrant workers, could also serve to improve agricultural productivity (Nossal & Sheng 2013), although improvements have been made in recent years (see Gibbs et al. 2013). There is also scope for established farmers to invest in improving their productivity by continuing formal education and training. Given constraints on farmers’ time and travel, advanced communication technologies may increase their access to more flexible learning opportunities.
Appendix: Key reforms and policy developments since 1983

Australia’s program of economic reform since 1983 has progressed in three main waves and has included extensive policy changes in the areas of:

- trade and financial regulation
- labour markets, public monopolies and competition policy
- the burden of regulation on business.

This section builds on Banks (2005) and Productivity Commission (2011a).

Trade and financial regulation

Capital markets

The Australian dollar was floated in March 1983. Foreign exchange controls and capital rationing (through interest rate controls) were removed progressively from the early 1980s and foreign-owned banks were allowed to compete, initially for corporate customers and then, in the 1990s, to act as deposit-taking institutions.

As an outcome of these reforms, the Australian financial sector is highly developed and internationally competitive. Financial services available to rural areas are also highly competitive, with the major banks and smaller rural banks providing tailored services. The Australian Government-owned national postal service (Australia Post) provides banking services through its network of retail outlets in select regional areas.

Trade reform

Reductions in tariff assistance began in 1973 with an across-the-board cut of 25 per cent. Further phased tariff reductions began in 1988 and 1991. Other reforms such as the abolition of quantitative import controls—mainly in the automotive, whitegoods, and textile, clothing and footwear industries—gathered pace from the mid 1980s. The effective rate of assistance to manufacturing fell from around 35 per cent in the early 1970s to 5 per cent by 2000 (Productivity Commission 2013).

As a result of these reforms, Australia’s economy is one of the most open and transparent in the world, although World Trade Organization (WTO) members also identified a number of policies and practices they considered could be improved, including:

- Australia’s strict sanitary and phytosanitary requirements and the absence of a cost-benefit approach
- remaining foreign investment restrictions in sensitive sectors
- the use of government procurement as an instrument of industry policy, mostly at the state and territory level of government
- Australia's anti-dumping and countervailing duty system (Productivity Commission 2011c).
Australia remains committed to multilateral trade reform. For example, Australia continues to push for the liberalisation of trade in agricultural exports through the Cairns Group of agricultural exporting countries. Australia has also signed a number of bilateral free trade agreements, including with Chile, Malaysia, New Zealand, Singapore, Thailand and the United States. In addition, Australia has a regional free trade agreement with the Association of South East Asian Nations and is negotiating agreements with China, India, Indonesia, Japan and the Republic of Korea. These agreements also cover a range of agricultural trade issues including: exchange of scientific information, protocols for live animal trade, agricultural cooperation, dialogue on trade policy, mutual recognition, trade facilitation, and specific bilateral trade issues (WTO 2011).

**Macroeconomic policy**

From the mid 1980s fiscal policy targeted higher national saving (and a lower current account deficit) and, from the mid 1990s, concentrated on reducing government debt, primarily financed through asset sales (privatisation). Inflation targeting was introduced in 1993.

**Foreign investment**

The reforms of the 1980s that opened the economy also liberalised foreign investment, increasing competition through the entry of foreign producers into domestic markets.

Although Australia has reduced its restrictions on foreign investment, the OECD reports that Australia imposes more restrictions on foreign investment than most other developed countries. Australia is ranked as the seventh most restrictive for foreign direct investment in the OECD area, and the tenth most restrictive for foreign investment in agriculture. However, Australia imposes fewer restrictions on foreign investment in agriculture than the OECD average (OECD 2013d). Australian industries facing more restrictions than the OECD average include the transport, media, telecommunications and financial services industries.

Australia’s investment regulation aims to encourage foreign investment that is consistent with the national interest. Under the *Foreign Acquisitions and Takeovers Act 1975*, the Foreign Investment Review Board (FIRB) screens certain foreign investment proposals to determine whether it is against the national interest (taking into account national security, competition, impacts on the economy and community, Australian Government policies such as tax, and the character of investors). Reviews are triggered by thresholds dependent on the nature of the investment (SRRATRC 2013).

Capital inflows arising from foreign investment in Australian agriculture have been vital to the sector’s development. Rural land purchases automatically fall under FIRB scrutiny if the value of the assets exceeds $248 million (or $1047 million for United States investors). The appropriateness of this threshold is currently being debated due to community concerns over foreign ownership of rural land. Nevertheless, the vast majority (88.7 per cent at 31 December 2010) of agricultural land is still fully Australian owned (ABS 2011).

However, foreign investment in Australian agribusiness appears to be higher than in farmland. There is no systematic source of data on foreign ownership of agribusiness in Australia, but there has been significant investment in wheat marketing, red meat processing, dairy manufacturing, and sugar milling and marketing. Investors have typically financed expansion or restructuring to improve efficiency and viability (Moir 2011). This was made possible by deregulation in agriculture industries, particularly the removal of statutory marketing authorities with powers of compulsory acquisition and single-desk selling arrangements.
Labour markets, public monopolies and competition policy

Labour market policies

Award restructuring and simplification, and the shift from centralised wage fixing to enterprise bargaining (decentralisation of wage bargaining mechanisms), began in the late 1980s. Reform accelerated in the mid 1990s with the introduction of the Workplace Relations Act 1996, further award simplification (through limiting prescribed employment conditions in enterprise bargaining agreements) and the introduction of individual employment contracts (known as Australian Workplace Agreements).

The current national workplace relations system, governed by the Fair Work Act 2009, commenced on 1 July 2009. A new regulatory body, Fair Work Australia, supports the new workplace relations laws and monitors their implementation.

National Competition Policy

The Australian and state and territory governments commenced reforms in the key infrastructure sectors of electricity, gas, road transport and water in the late 1980s. In 1995 these reform processes were consolidated and extended in a coordinated National Competition Policy (NCP).

NCP extended competition into areas of the economy that had been dominated by government monopolies, typically in the provision of infrastructure, or where competition has been restricted by legislation (including by statutory agricultural marketing arrangements).

NCP consisted of three agreements between the Australian Government and all state and territory governments:

- The Competition Principles Agreement set out principles for reforming government monopolies (including structural reform requirements and, where they were retained, pricing oversight), access regimes for essential infrastructure facilities, 'competitive neutrality' mechanisms and pricing oversight of government businesses. The agreement led to the review of over 1800 items of anti-competitive legislation.

- The Conduct Code Agreement extended Australia’s competitive conduct rules (then the Trade Practices Act 1974, now the Competition and Consumer Act 2010) to previously exempt government businesses and unincorporated enterprises. The Act (and a range of additional legislation) is administered by an independent statutory agency, the Australian Competition and Consumer Commission, established in 1995.

- The Implementation Agreement recommitted governments to earlier reforms in gas, electricity, water and road transport. It specified a program of $16 billion in financial grants to state and territory governments, contingent on implementation of reforms (Productivity Commission 1999a).

NCP reforms delivered substantial benefits to the Australian community, stimulating innovation and contributing to growth in productivity and household incomes, and directly reducing the prices of some goods and services. Conservative estimates of the benefits of NCP reforms up to 2000 suggest they increased Australia’s GDP by 2.5 per cent in 2005 (Productivity Commission 2005a).
Infrastructure services

Partial deregulation and restructuring of airlines, coastal shipping, telecommunications and the waterfront occurred from the late 1980s. Across-the-board commercialisation, corporatisation and privatisation initiatives for government business enterprises were progressively implemented from around the same time.

Under NCP, the electricity, gas, urban water, telecommunications, urban transport, ports and rail freight sectors experienced reforms, including the introduction of third-party access regimes to infrastructure on reasonable terms and moves towards cost-recovery pricing.

There have been three significant changes in this area:

- extending the Trade Practices Act to apply to government business enterprises (GBEs)
- structural reform of GBEs (and introducing competitive neutrality provisions)
- third-party access arrangements for infrastructure services.

Reform to infrastructure services (including some that began as GBEs) provided substantial benefits. Productivity and price changes in key infrastructure in the 1990s were estimated to have increased Australia’s GDP by 2.5 per cent by 2000 (Productivity Commission 2008a). This estimate does not include the likely ‘dynamic’ efficiency gains from more competitive markets. Nor does it account for the benefits households receive from paying less for goods and services (because businesses also spend less on infrastructure services).

Government services

Competitive tendering and contracting out, performance-based funding and user charges were introduced in the late 1980s and extended in scope during the 1990s; administrative reforms (for example, financial management and program budgeting) were introduced to human service provision in health, education and community services in the early 1990s.

Rural water reforms

Significant reforms to the institutions and processes for allocating and pricing rural water were motivated by the need to ensure the long-term sustainability of both the water sector and the environment. While prices for irrigation services generally covered direct operating and maintenance costs, no allowance was made for asset depreciation. As a result, many river systems were over-extracted and priced for less than the cost of service provision (Industry Commission 1992).

In 1994 the Council of Australian Governments (CoAG) agreed to a reform framework (later incorporated in the NCP agreements) to make the Australian water industry more efficient and sustainable. Key principles of the 1994 water reform agreement were to achieve full cost recovery, separate water entitlements from land titles, allocate water specifically for environmental use, encourage intrastate and interstate trading in water entitlements, and improve water quality. In addition, a cap was placed on river diversions within the Murray–Darling Basin. The cap effectively limited water use in the Basin to 1993–94 levels (see Hogan & Morris 2010; Industry Commission 1998; Productivity Commission 2005a). Through NCP, many irrigation schemes were corporatised, leading to a focus on ensuring access and use prices that reflected the costs of supply.
In 2004 most governments in Australia agreed to the National Water Initiative, which was designed to complement and extend the 1994 reform framework. Some key features of the initiative were to create water access entitlements for consumptive water that were separate from land, give statutory recognition to environmental water, adjust over allocated and/or overused water systems to more sustainable levels of use, and implement water trading arrangements that facilitated the efficient operation of water markets.

In 2007 the Water Act 2007 created the Murray–Darling Basin Authority, which was responsible for developing the Murray–Darling Basin Plan. The Basin Plan sets new environmentally sustainable limits on the volumes of surface water and groundwater that can be diverted from the basin for consumptive use (surface water diversions are to be reduced by 2750 GL on average) and develops an environmental watering plan.

Reducing the burden of regulation on businesses

National Reform Agenda

Following the conclusion of NCP in 2005, many of its objectives were taken up in the COAG National Reform Agenda (NRA). In addition to facilitating competition, the agenda also focused on promoting best-practice regulation and reviewing legislation to reduce burdens on business, as well as human capital reform to improve health, learning and work outcomes. All Australian, state and territory governments have now introduced, or upgraded, regulatory impact systems to improve the scrutiny of new regulatory proposals likely to impose a significant burden on businesses. In particular, the legislation review program aimed to ensure that legislation did not restrict competition unless it could be shown that the benefits to the community outweighed the costs, and that the objectives of legislation could only be achieved by restricting competition.

Under the regulatory reform stream of the National Reform Agenda, the Australian Government asked the Productivity Commission to undertake a series of reviews of the burdens on business from Commonwealth regulation, to identify areas where regulatory reform would provide significant net benefits to business and the community. These were completed for the primary sector (including agriculture), the manufacturing sector and distributive trades, social and economic infrastructure services, and business and consumer services (Productivity Commission 2007, 2008b, 2009a, 2010).

Further reviews examined the frameworks and approaches that could most effectively identify areas for regulation reform and methods for evaluating reform outcomes (Productivity Commission 2011a), as well as Australia’s regulatory impact assessment frameworks (Productivity Commission 2012). In the latter case, Australia's regulatory impact assessment frameworks are generally consistent with OECD principles. In practice, however, the primary potential benefits have often been forfeited because assessments are often conducted after policy decisions are made or in a perfunctory manner, with diminished opportunity to adequately evaluate all relevant policy options.

Other key reforms and reviews

Taxation reform

Capital gains tax and the dividend imputation system were introduced in 1985 and 1987, respectively. The company tax rate has been lowered progressively from the late 1980s. A broad-based consumption tax, the goods and services tax (GST), was implemented in 2000, replacing the narrow wholesale sales tax system and a range of state-based duties. At the same time, income tax rates were lowered.
In 2008 the Australia’s Future Tax System Review (the Henry tax review) was established to review Australia’s tax system. The final report was released in 2010 (AFTS 2010) and identified 138 recommendations under nine broad themes:

- concentrating revenue-raising on four efficient tax bases
- configuring taxes and transfers to support productivity, participation and growth
- an equitable, transparent and simplified personal income tax
- a fair, adequate, and work-supportive transfer system
- integrating consumption tax compliance with business systems
- efficient land and resource taxation
- completing retirement income reform and securing of aged care
- toward more affordable housing
- a more open, understandable and responsive tax system.

Some key recommendations and issues raised in the review, along with stakeholder views relevant to agricultural industries, are outlined in PwC (2011). In addition, the Australian Government is intending to prepare a Taxation White Paper during its first term.

Biosecurity

Australia’s biosecurity system is responsible for managing biosecurity risks associated with the international movement of people and goods. Australia’s biosecurity policies and risk management measures aim to prevent or control the entry, establishment or spread of pests and diseases that could cause significant harm to people, animals, plants and other aspects of the environment (DAFF 2011).

The Australian Government’s biosecurity policy approach is to allow imports if the expected biosecurity risk is assessed to be within Australia’s appropriate level of protection. The Australian Government, with the agreement of all state and territory governments, has expressed Australia’s appropriate level of protection as ‘providing a high level of sanitary and phytosanitary protection aimed at reducing risk to a very low level, but not to zero’ (DAFF 2012b, p.5).

Over the years, Australia’s biosecurity system has been the subject of a number of reviews which have identified a range of strengths and weaknesses (for example, Beale et al. 2008; Nairn et al. 1996).

In February 2008 the Australian Government appointed an independent panel to review Australia’s quarantine and biosecurity arrangements. The Beale review, One biosecurity: a working partnership (Beale et al. 2008), concluded that Australia operates a good biosecurity system that has protected the Australian people, economy and environment from significant damage in the past but there was significant scope for improvement. It proposed significant reforms to strengthen the system by revising legislation and improving governance arrangements, transparency, timeliness and operations across the biosecurity continuum. Key concerns identified by the Beale review, as given in DAFF (2012b, pp. 7–8), include:
the use of mandatory intervention targets, which led to resources being allocated to lower risk areas rather than where they could achieve a better biosecurity outcome

- outdated information technology capability, leading to inefficient operations and higher costs to business

- complicated and dated legislation, leading to complex administration and compliance costs

- a need for comprehensive onshore monitoring and surveillance to support Australia’s exports, which are classed as having a low pest and disease risk, and a need to support onshore pest management

- a need for an improved partnership approach to biosecurity in which all stakeholders play a role

- inadequate resources for the task, particularly for offshore and onshore activities. The review recommended an increase in funding of about $260 million a year, subject to budgetary processes. It also identified the need for an investment in the order of $225 million to improve information and technology systems

- suboptimal organisational structures and governance arrangements that did not support a clear role for the Australian Government or Parliament, encouraged the perception of political interference and detracted from the sharing of information and a common mission.

In December 2008 the Australian Government agreed in principle to the recommendations outlined in the report and commenced Australia’s biosecurity reform process. The reform process is wide-ranging and is based on five key principles:

- implementing a risk-based biosecurity management

- managing biosecurity risk across the continuum (offshore, at the border and onshore)

- strengthening partnerships with stakeholders

- Intelligence-led and evidence-based decision-making

- supported by modern legislation, technology, funding and business systems.

Specific aspects of the biosecurity reforms and an overview of the achievements and progress made against these five key principles, linked to the applicable recommendations of the Beale review, can be found in DAFF (2012b).
Glossary

COAG  Council of Australian Governments
CSIRO  Commonwealth Science and Industrial Research Organisation
EC  exceptional circumstances
FDI  foreign direct investment
FIRB  Foreign Investment Review Board
GBE  government business enterprise
GDP  gross domestic product
GM  genetically modified
GVP  gross value of production
NCP  National Competition Policy
NDP  National Drought Policy
OECD  Organisation for Economic Co-operation and Development
PSE  producer support estimate
R&D  research and development
RDC  research and development corporation
RD&E  research, development and extension
SMA  statutory marketing authority
WTO  World Trade Organization
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