



INDUSTRY COMMISSION
SUBMISSION TO THE
MID-TERM REVIEW
OF THE RURAL
ADJUSTMENT SCHEME

November 1996



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ISBN 0 644 47534 X

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Forming the Productivity Commission

The Commonwealth Government, as part of its broader microeconomic reform agenda, is merging the Bureau of Industry Economics, the Economic Planning Advisory Commission and the Industry Commission to form the Productivity Commission. With the agencies co-located in the Treasurer's portfolio, amalgamation has proceeded on an administrative basis. The relevant legislation will be introduced soon. This report has been produced by the Industry Commission.

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(also on www.indcom.gov.au/iclinks.html)

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ABBREVIATIONS

na	not available
..	nil or less than 0.5
0	small value rounded to zero in tables
ABARE	Australian Bureau of Agricultural and Resource Economics
ABS	Australian Bureau of Statistics
APEC	Asian Pacific Economic Co-operation
CES	Commonwealth Employment Service
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DC	Rural research and development corporation/council
DEET	Department of Employment, Education and Training
DPIE	Department of Primary Industries and Energy
DRP	Drought Relief Payment
DSS	Department of Social Security
EC	Exceptional Circumstance
EVAO	Estimated Value of Agricultural Output
FHS	Farm Household Support
GDP	Gross Domestic Product
HECS	Higher Education Contribution Scheme
IAC	Industry Assistance Commission
IC	Industry Commission
JSA	Job Search Allowance
LGA	Local Government Area
MFP	Multi-factor Productivity
QDPI	Queensland Department of Primary Industry
RAS	Rural Adjustment Scheme
RASAC	Rural Adjustment Scheme Advisory Council
RBA	Reserve Bank of Australia
R&D	Research and Development
SOI	Southern Oscillation Index
TAFE	Technical and Further Education
WTO	World Trade Organisation

EXECUTIVE SUMMARY

Adjustment to change is a continuing challenge for all industries, including the agricultural sector. The impetus for rural adjustment can come from many sources including changes in the weather, technology, the quality of management, conditions in local and international economies, and the natural environment. The importance of the various factors will vary over time.

In an uncertain environment, response to changing circumstances is inherently risky. To balance risk, there also needs to be rewards for farm businesses who are successful in adjustment — adapting resources to their most efficient use. How the agricultural sector responds to change depends on how farmers plan and manage their resource use and their expectations about the future. Their ability to respond efficiently to change is sensitive to the availability of information about varying market and agricultural conditions. Some government interventions, and failures in market processes can reduce or impede the flow of information to farmers, thereby limiting their opportunities for efficient adjustment.

This submission focuses on the efficient adjustment of resource use by the agricultural sector in response to changes in its circumstances. In particular, the submission canvases the issues underlying the level and form of any future government involvement to facilitate farmer responses to ongoing adjustment pressures.

The case for RAS support

This Mid-Term Review provides an opportunity to assess whether there are significant rural adjustment problems that warrant government action and, if so, the most efficient form of government intervention. From the perspective of making the best use of national resources, the major concern should be to ensure that change is not inhibited by factors within government control.

In the past, some factors have impeded entry into agricultural activities, particularly capital market controls, regulations governing the use of land and farm inputs, and statutory marketing arrangements for agricultural commodities. Many of these regulatory arrangements have now been dismantled or extensively modified, so the associated need for government involvement in rural adjustment has diminished.

While the lumpy and site-specific nature of farm assets may impede the withdrawal of resources from existing agricultural activities, on the face of it these features do not represent significant obstacles. Many other industries (eg those with large sunk costs) could claim similar barriers to exit.

Individual farmers are best placed to evaluate and manage their exposure to the risks associated with agricultural activities. Advances in information technology have increased the capacity of farmers to assess and evaluate alternative risk management strategies. However, the key issues are:

- whether significant information gaps remain;
- if so, whether the government has a role in overcoming such gaps; and
- whether any information provided by government should be on a fee-for-service basis.

In the past, rural adjustment assistance may have been justified to compensate the agricultural sector for the effects of other government policies, in particular assistance to manufacturing industry. However, the average level of assistance for manufacturing is now lower than that for agriculture. If there are concerns about the impact of other government interventions on agricultural industries, the most appropriate course of action would be to address the relevant interventions at source.

RAS assistance may have avoided resort to other, less efficient, forms of assistance to the agricultural sector. An issue for review is whether RAS continues to deflect demands for additional support, or whether it merely provides an institutional platform for mounting requests for support at the expense of initiatives that would normally be undertaken by individual farms.

Overall, the case for RAS on efficiency grounds does not appear to be strong. If, instead, RAS support is justified on welfare grounds, the following criteria should be satisfied:

- the welfare support should be delivered in a way that minimises negative feedbacks to efficiency; and
- the interaction between RAS welfare support and the general social security system should not create major inequities and/or adverse incentives for the allocation of resources.

Program performance

Analysis of ABARE farm survey data suggests that, on balance, overall adjustment and related assistance is impeding rather than facilitating adjustment in the size and ownership of farms. Doubts also exist about the performance of individual components of the RAS 1992 package in facilitating efficient adjustment in the agricultural sector.

Interest subsidies

The rationale for interest subsidies on efficiency grounds is not strong. There is little evidence that farmers as a group have difficulty in gaining access to finance. The fact that some farmers may not be able to attract the finance they need is more likely to be an indication of dubious financial viability rather than a market failure warranting government support.

In some circumstances, interest subsidies are likely to have no impact on loan allocations, but merely provide a windfall gain to the some 2 500 farm enterprises receiving the subsidies. In other circumstances they are likely to have an adverse effect on efficiency.

Overall, there is no evidence that the interest subsidy provisions of the scheme improve on the operation of the market.

Support for training and professional advice

This form of support can be justified if the benefits of education and training extend beyond those that can be captured by the recipient. However, the range of training and advice supported under the RAS is relatively narrow and targeted at the needs of particular farmers. The resultant benefits are likely to be wholly captured by the individual farmer or farming group.

The balance of benefits afforded by the training provisions of RAS needs to be reviewed, as does the role of RAS support in meeting the vocational and training requirements of the sector. The role of other information services in meeting farmers' needs should also be considered.

If, on balance, RAS grants for training and professional advice are maintained, the practicality of farmer contributions and/or repayment options should be considered.

Re-establishment grants

The extent of annual departures from the agricultural sector suggests that the evidence of significant regulatory barriers to exit from the agricultural sector is weak.

Given the way the grants are structured, it is possible that they defer rather than expedite departures from the industry. If they are maintained on welfare grounds, the present sliding scale of grant payments should be eliminated or modified to prevent any adverse impact on the pace of adjustment.

Land trading

The key issue is whether such a minor scheme materially adds to the re-establishment grants provision, and whether the costs of administration of this special element outweigh any economic or welfare benefits.

Support for exceptional circumstances

While farmers might prefer to operate in a more stable environment, this alone does not establish a case for intervention. If farmers' risk management options are curtailed there could be a case for intervention on efficiency grounds, but the appropriate intervention is more likely to involve addressing the impediments at the source rather than providing income support. A key issue for review is whether government assistance for exceptional circumstances is impeding the design and marketing of commercial insurance schemes and other rigorous farmer/financier risk management strategies.

The evidence available to the Commission suggests that support for farmers in exceptional circumstances (such as severe drought) may be detracting from self-reliance and effective risk management by farms. The evidence also raises questions as to whether the move to a contingency-based criterion for carry-on assistance has been an effective strategy for limiting assistance to those farm households in clear need of support.

Summing up

RAS has benefited individual farmers. However, a broad examination of the scheme reveals little evidence that its overall contribution to economic efficiency is positive. Indeed, much of the information examined by the Commission suggests that any contribution is likely to be negative. In particular, there are significant doubts about the appropriateness of the interest rate subsidies, re-establishment grants and the exceptional circumstances

provisions of the scheme. There are also doubts concerning the balance between the public and private benefits of the grants for training and professional advice, and whether RAS is the appropriate vehicle for providing these services. If the Scheme is to be retained, nevertheless, there appears to be scope to reduce its efficiency costs to the community through modifications to the support measures used.

PART 1 REPORT

1 INTRODUCTION

A Mid-Term Review of the Rural Adjustment Scheme (RAS) was first proposed when the current scheme (RAS 1992) was introduced. Details of the Review were announced by the Minister for Primary Industries and Energy in September 1996.

The purpose of the Review is to report on:

- the future adjustment challenges facing Australia's agricultural sector;
- the role of risk management in on-farm business strategies; and
- the role, if any, of government intervention.

The Review is required to examine the appropriateness of the RAS program, the efficiency and effectiveness of the delivery system, and the effectiveness of the support elements.

This submission to the Mid-Term Review focuses on economic efficiency issues, in particular the level and form of government involvement to facilitate farmer responses to ongoing adjustment pressures. In considering these issues, the submission adopts an economy-wide perspective. Thus, assessments of the efficiency of the present arrangements are based on the net benefits to the economy as a whole, not simply the benefits to farmers and farm households.

This submission:

- outlines the extent of rural adjustment, government assistance and the evolution of the current government measures that support rural adjustment (Chapter 2);
- considers the rationale for government involvement (Chapter 3); and
- examines the overall effectiveness of RAS 1992 and its key components (Chapter 4).

2 RURAL ADJUSTMENT AND THE EVOLVING AGRICULTURAL SECTOR

2.1 Introduction

The agricultural sector traditionally has been characterised by significant government involvement. The Rural Adjustment Scheme (RAS) is but one form of that involvement. As the agricultural sector has experienced major changes over time in its size and composition, so too have the objectives and scope of government interventions changed. This chapter examines the evolution of the RAS, in the context of changes in agriculture and government assistance to agriculture more generally.

The chapter discusses first the nature and extent of adjustment occurring in agriculture. There have been changes in the size of agriculture relative to other sectors of the economy, changes in the mix of activities within agriculture, and changes in resource use and farm management practices within particular agricultural activities. The chapter then examines the level and mix of government support to agriculture, relative to that for other sectors. Finally, the chapter provides an historical perspective of the evolution of the RAS as the major vehicle for government support to facilitate economic change in agriculture.

2.2 The nature of agricultural adjustment

Australia's agricultural sector has undergone considerable change over the last fifty years. This has involved changes in the size and importance of the sector relative to the remainder of the economy and, perhaps more significantly, in the structure and operational characteristics of farms within the agricultural sector.

Sources of change

A number of factors have contributed to the change process, some of which are shared with other sectors and some of which are of particular importance to the agricultural sector.

All sectors have faced changes in the demand for their products as per capita incomes have risen, both here and overseas. To the extent that the agricultural

sector's products are necessities rather than luxuries, they have commanded a declining relative share of household budgets over time. The sector therefore has been less susceptible to variations in the growth in per capita incomes.

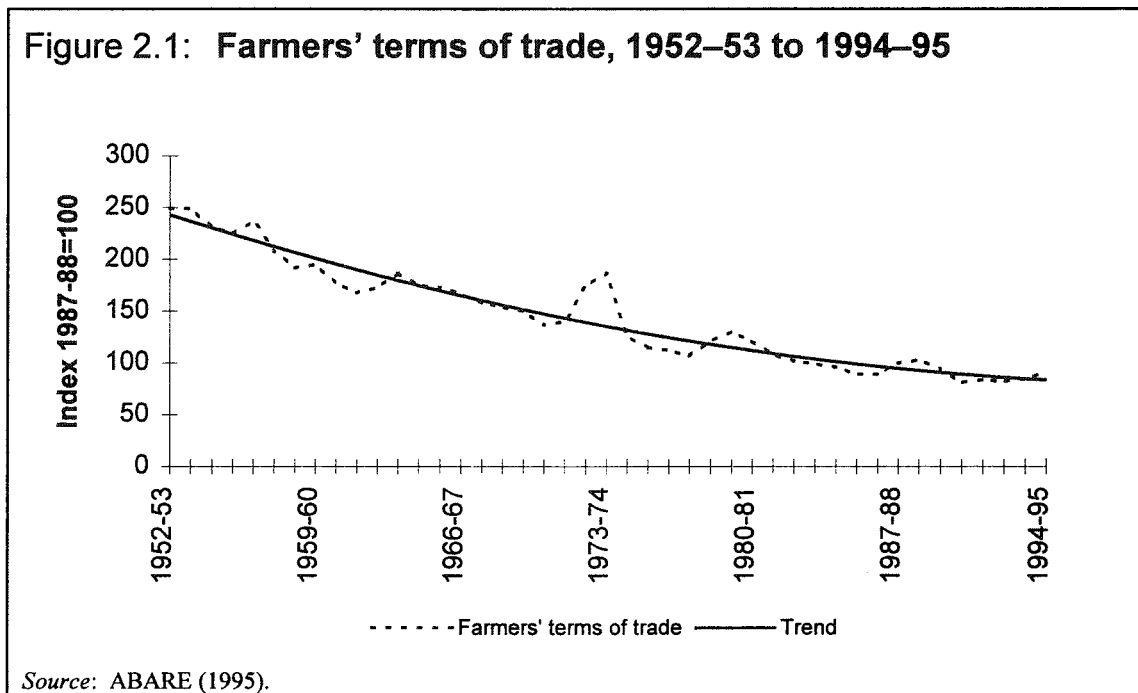
Nevertheless, all sectors have been affected by business cycles and associated changes in macroeconomic policy settings. Similarly, all sectors have been affected to varying degrees by microeconomic reforms and changes in trade policies, both here and overseas. Because Australia's agricultural sector is export-oriented, with limited ability to pass on cost increases in the form of higher prices, it has been a net beneficiary of domestic microeconomic and trade policy reforms. It has certainly been a major beneficiary of recent multilateral trade liberalisation initiatives through the WTO and APEC.

There are several sources of change which are of particular importance to the agricultural sector, not just because of their long-term impacts, but also because of the short-term volatility they introduce. The first source is changes in commodity prices and in the sector's terms of trade. Long-term trends in these have been driven by rising incomes and technological changes. Short-term fluctuations have often reflected variations in agricultural production around the world due to the second important source of change — the weather. The agricultural sector is particularly vulnerable to changes in seasonal conditions because of the biological nature of production. Successive versions of the RAS have increasingly focused on these two sources of change.

Prices and terms of trade

The agricultural sector predominantly comprises small businesses producing relatively homogeneous commodities traded on world markets. Most farmers have no control over the prices they receive for their output or the prices they pay for their inputs. The ratio of prices received for outputs relative to the prices paid for farm inputs — the farmers' terms of trade — is one of the sources of fundamental change in the agricultural sector. The terms of trade for the agricultural sector as a whole have declined over the past 40 years at an average annual rate of 2 per cent, with erratic year to year changes around this trend (Figure 2.1).

Figure 2.1: Farmers' terms of trade, 1952-53 to 1994-95



Weather

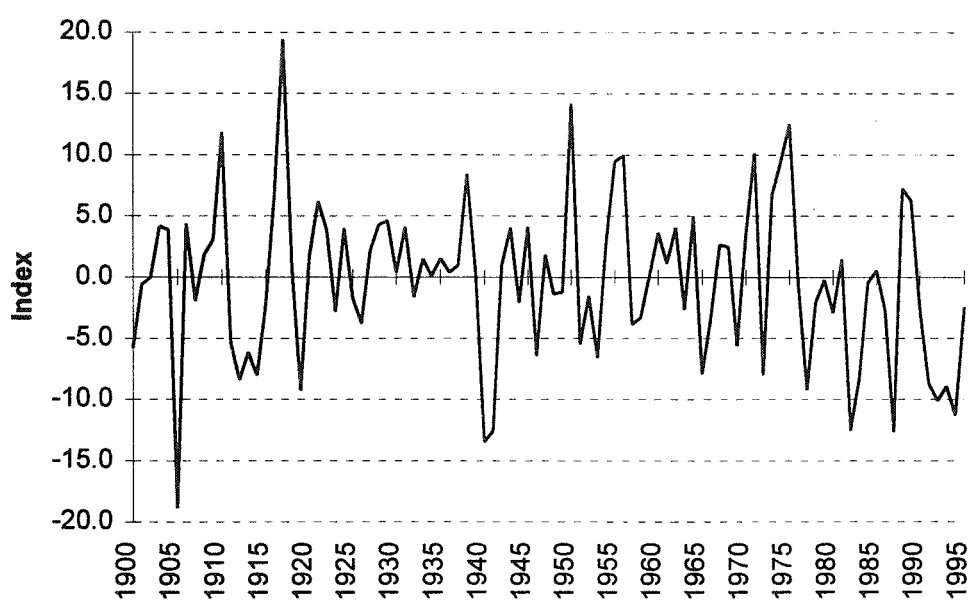
Rainfall in most of Australia's agricultural regions is relatively low on average and highly irregular compared to the rest of the agricultural world. As a result, drought occurs frequently and often over a wide area. Australia's weather patterns — rainfall, cloud cover, evaporation and humidity — are strongly influenced by air pressure changes caused by varying sea surface temperatures. These changes have been linked to the El Nino effect of widespread drought in eastern Australia. The Southern Oscillation Index (SOI) is a measure of the difference in air pressure between Darwin and Tahiti which has a strong positive correlation with rainfall in eastern Australia.¹

By itself, the SOI is too simple a measure to capture the incidence of drought, since this also depends on the timing of rainfall and the geographic location and agronomic systems being affected. However, it shows one of the important factors at work. Since the beginning of this century the SOI has shown wide variation, with many parts of eastern Australia recently experiencing several

¹ The SOI is an index ranging from -30 to +30. When the SOI falls below -5, there is 75 per cent chance that eastern Australia will experience lower than average rainfall. When the SOI lies above +5, there is 75 per cent chance that eastern Australia will experience above average rainfall.

periods of lower-than-average rainfall over a relatively short period (Figure 2.2).

Figure 2.2: The Southern Oscillation Index, 1900 to 1996



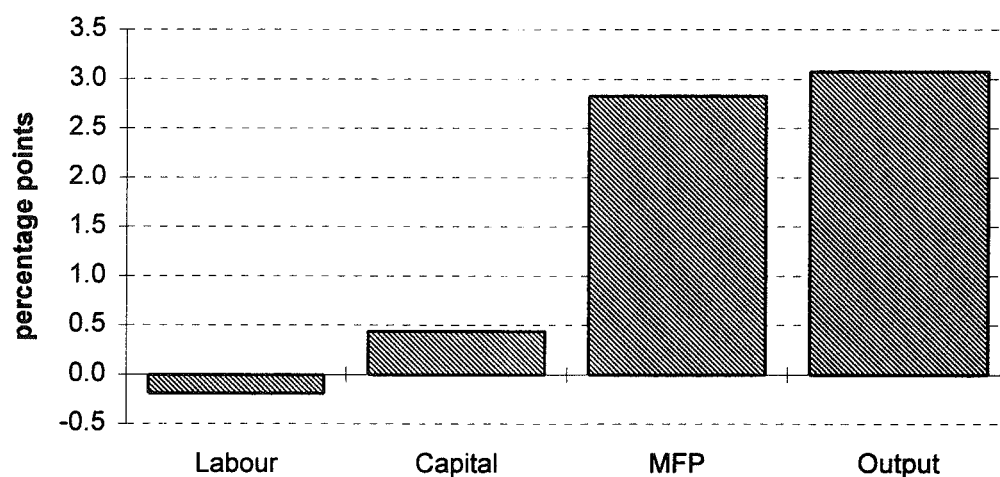
Source: QDPI (1996).

Responses to change by the agricultural sector

The downward trend in commodity prices would, in isolation, be a disincentive to expanded production. However, largely because of technological change which has lowered unit costs, agricultural output has continued to expand. Over the 20-year period 1974–75 to 1993–94, the real value of farm product has grown at an average annual rate of 3.1 per cent. A myriad of technological and land use changes in the production of individual commodities has driven this expansion.

The Commission has segmented the main sources of this output growth into three components: labour, capital and productivity growth (Figure 2.3). This analysis shows that productivity has been the main contributor to the growth in agricultural output. As the sector has moved toward more capital intensive techniques, growth in capital inputs has also made a small positive contribution to output growth, as has a decline in labour inputs.

Figure 2.3: Contributions to average annual growth in real output of the agriculture, forestry, fishing and hunting sector, ^{a,b} 1974–75 to 1993–94 (percentage points)



MFP Multi-factor productivity.

a Labour is measured by total hours worked.

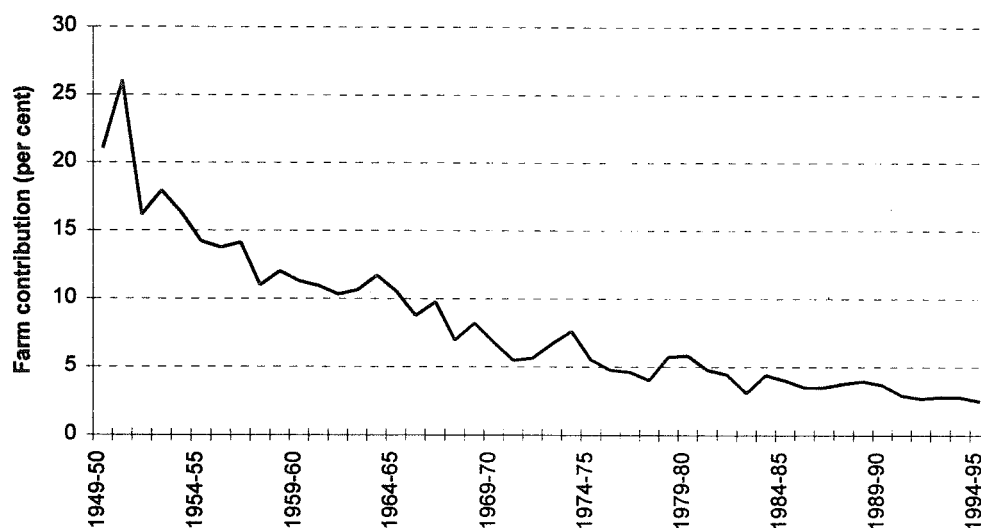
b Multi-factor productivity is estimated by subtracting from output growth the contributions due to labour and capital growth.

Sources: ABS (1996a, 1995).

Adjustment between agriculture and other sectors

Despite the absolute growth in the output of the agricultural sector, its relative importance has declined. The contribution of farm product to the economy has fallen from around 20 per cent of GDP at the end of the 1940s to less than 3 per cent in the 1990s (Figure 2.4). Average annual growth in farm product (at current prices) over this period was 7.9 per cent, compared with 10.7 per cent for the economy as a whole (ABS 1996a).

Figure 2.4 Contribution of the farm sector to gross domestic product, 1949–50 to 1994–95 (per cent)



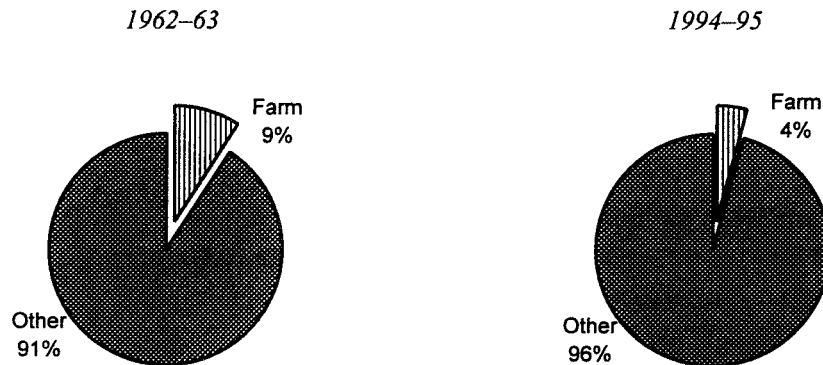
Source: ABS (1996a).

Changes in agricultural use of labour, capital and land

With improvements in agricultural productivity and emerging production opportunities in other sectors (the service industry in particular, see IC 1993, Appendix D), the labour and capital committed to agriculture relative to other sectors has also declined.

In the case of labour, the number of people directly employed in the agricultural sector (including owner-operators) declined by 19.2 per cent — from 443 000 persons in 1962–63 to 358 000 in 1994–95. This resulted in agricultural employment falling from about 9 per cent to 4 per cent of total employment (Figure 2.5).

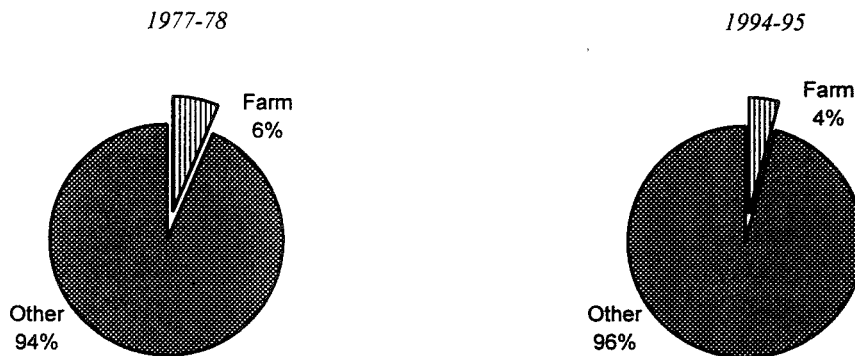
Figure 2.5: Contribution of the farm sector to national employment, 1962–63 and 1994–95



Source: ABARE (1995).

Over the period 1977–78 to 1994–95, the fixed capital stock in agriculture rose in absolute terms. However, because investment in other industries rose at a greater rate, the share of agricultural fixed assets in the national capital stock declined from around 6 per cent to 4 per cent (Figure 2.6).

Figure 2.6: Contribution of the farm sector to national fixed capital stock, 1977–78 and 1994–95



Source: ABS (1995).

Finally, there have been changes over time in the amount of land devoted to agricultural uses. The total area rose from about 440 million hectares in 1950 to

around 495 million hectares in 1980, but subsequently declined to around 460 million hectares in 1993 (see Figure 2.8).

Over the last 35 years, there has also been a significant reduction in the number of farms, and therefore of farm operators. Between 1952–53 and 1992–93, the number of farms declined from 204 200 to 120 655 (ABARE 1995).²

With the changes in the total area of land committed to agriculture, and the decline in the number of farms, the average farm size has increased between 1952–53 and 1992–93 from 2 205 to 3 813 hectares.³

Adjustment within the agricultural sector

While land, labour and capital have shifted between the agricultural sector and the rest of the economy, these resources have also moved within the agricultural sector. The latter reflects the relative ease of reallocating labour and fixed capital between agricultural activities and the capacity to use land for different purposes. Shifts in resource use between activities within agriculture have been a key way in which the sector has responded to cyclical changes in its business environment, particularly in the market prices of various agricultural commodities. Diversification — undertaking more than one activity at once — and farm enlargement have also helped to cushion individual farms against certain types of volatility.

Composition of agricultural output

Wheat, beef and wool remain the major contributors to agricultural output. However, the relative size of some activities have changed substantially, particularly wool and other crops (horticulture, extensive irrigation and high rainfall, and extensive crops other than wheat). For example, the contribution of other crop production in 1994–95 amounted to 40 per cent of the value of agricultural production, compared with 23 per cent nearly thirty years earlier (Figure 2.7). Conversely, the relative contribution of wool to agricultural production has fallen from 25 per cent to 15 per cent over the same period.

² This reduction is overstated by a break in the series. Before 1986–87, the data included agricultural establishments with an estimated value of agricultural operations (EVAO) of \$2 500 or more. From 1986–87, the threshold EVAO was raised to \$20 000, and again from 1991–92 to \$22 500. Nevertheless, this break does not reverse the downward trend in the number of farms. On one crude correction for the series break, the number of farms still falls by 25 per cent.

³ This increase in farm size is also overstated as it is calculated using the number of farm establishments which has a break in the series. On one crude correction for the series break, the average farm size still rises to 2 800 hectares.

Figure 2.7: Contribution of agricultural activities to the value of agricultural output, 1964–65 and 1994–95

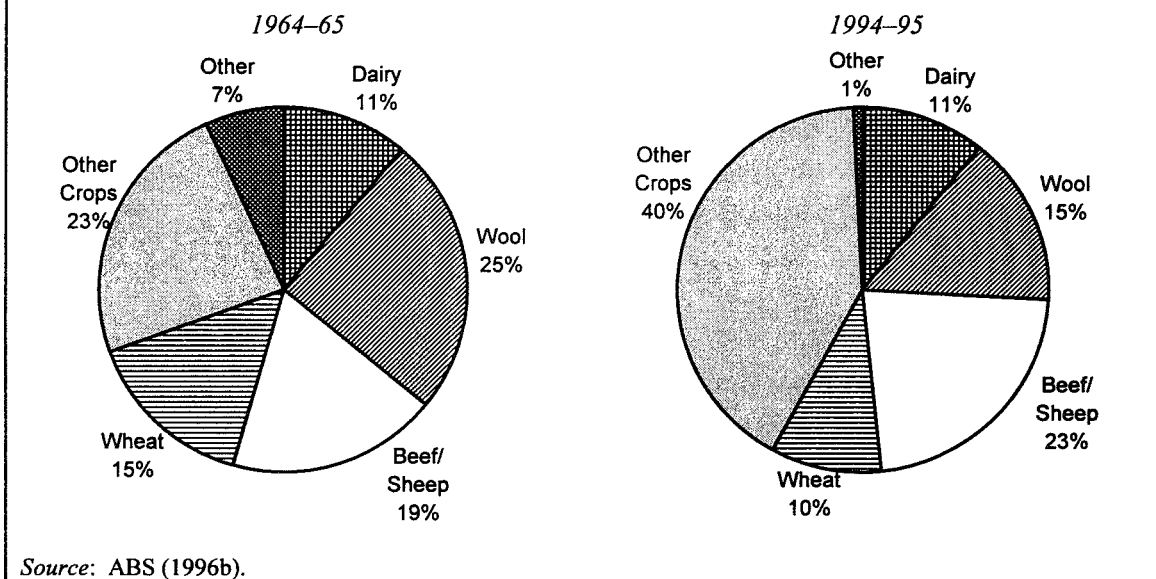
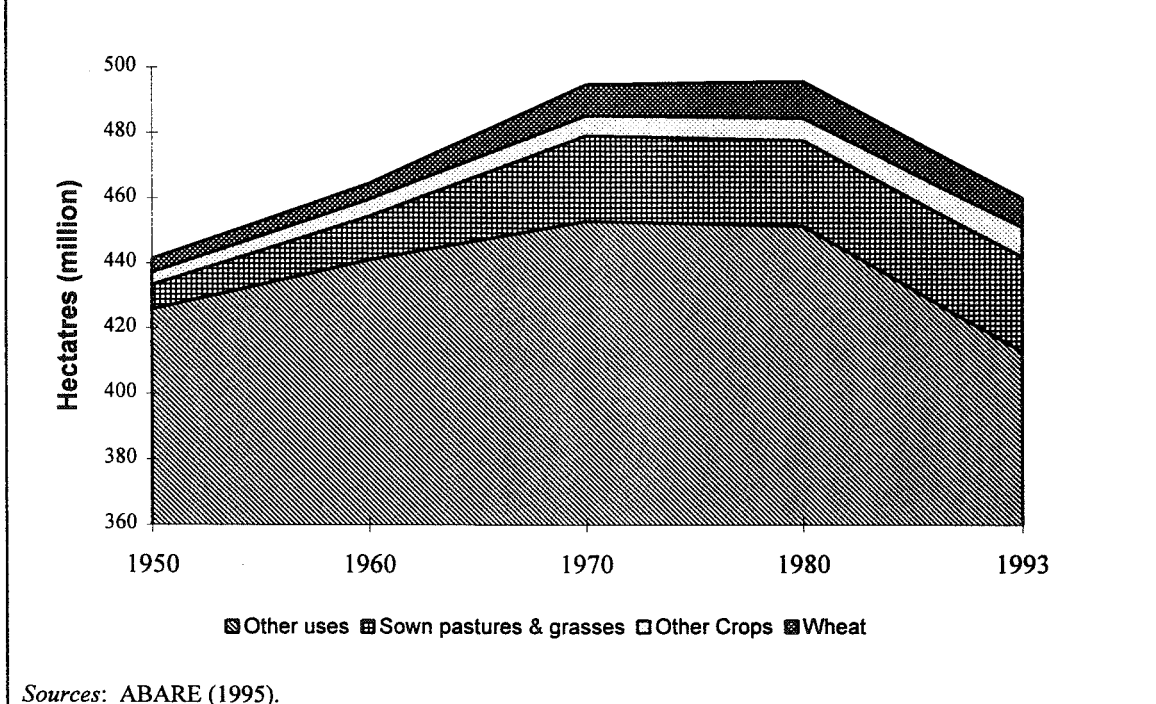


Figure 2.8: Deployment of land for agricultural uses, 1950 to 1993



Land usage

As noted, the total area of land committed to agriculture has expanded and then contracted in absolute terms (Figure 2.8). Within the total, the areas devoted to alternative uses have also changed substantially. While the area devoted to 'other' uses declined in absolute terms between 1980 and 1993, the areas committed to crops (including horticulture, extensive irrigation and high rainfall, and extensive crops) and sown pastures increased in absolute terms throughout the entire 1950–1993 period.

Adjustment within activities/enterprises

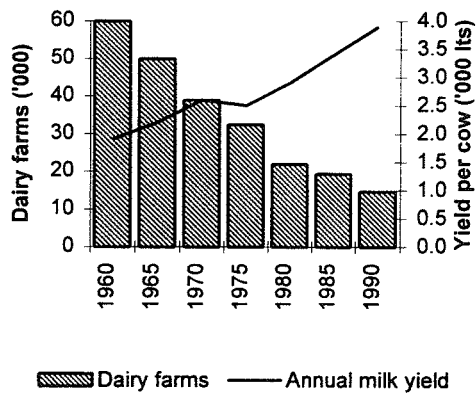
Aggregate changes in farm numbers conceal substantial restructuring and other adjustments that have occurred at the farm level in individual activities.

Dairying provides one example. While the number of dairy farms fell from nearly 60 000 to just under 15 000 between 1960 and 1990, the average number of cows per farm doubled. At the same time, annual milk output per cow increased from 1 900 litres to 3 900 litres (Figure 2.9), increasing total milk production from 6.1 billion litres in 1960 to 6.4 billion litres in 1990.

Similarly, the number of pig farmers dropped by about 90 per cent between 1960 and 1994 (primarily through the departure of small non-specialist producers), while the average herd size increased from under 5 sows to nearly 70. Combined with increases in slaughterings per sow and the average slaughter weight of pigs, this has increased pigmeat production from 267 000 tonnes in 1985 to a record 347 000 tonnes in 1994 (IC 1996a).

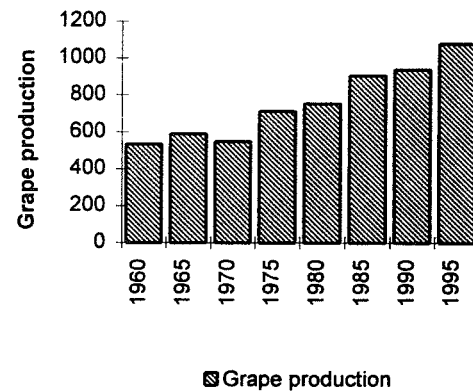
In the grape industry, land use has increased, but production has grown at an even faster rate. Land committed to grape growing increased 67 per cent between 1960 and 1995, but grape production more than doubled (Figure 2.10).

Figure 2.9: Number of dairy farms and annual milk yield, 1960 to 1990



Sources: IAC (1983a), IC (1991), ABARE(1995).

Figure 2.10 Grape production, 1960 to 1995



Source: ABARE (1995).

Changing government involvement

Without government involvement, the direction of agricultural change would be determined solely by costs of production and marketing, and consumer tastes both in domestic and export markets. However, the agricultural sector has a substantial history of government involvement that has affected the allocation of resources between activities in the agricultural sector and between the agricultural sector and the rest of the economy. Furthermore, as the agricultural sector has evolved, so too has the nature and extent of government involvement.

The next section examines the overall level of government support recently afforded the agricultural sector. In light of changes in the industry itself, the following section then looks at the evolution of government support for agricultural adjustment over the last 60 years.

2.3 Government assistance to agriculture

Agriculture receives support from a number of Commonwealth, State and local government programs (Appendix A). The support is provided through government outlays to industry, and through market interventions such as the operation of statutory marketing arrangements.

The Commission has analysed Commonwealth budgetary assistance and marketing arrangements to estimate total assistance to agriculture. Across all agricultural industries, this assistance was equivalent to around 11 per cent of value added in 1994–95 (Table 2.1). Rural adjustment assistance provided through the RAS contributed around 1.4 percentage points to this total. The level of rural adjustment support differed only fractionally between agricultural activities. Extensive grazing activities received proportionally the most support in 1994–95, due primarily to wool marketing and drought ‘exceptional circumstances’. Horticulture received the least support from adjustment assistance.

Table 2.1: Effective rates of assistance by industry group and component, 1994–95 (per cent)

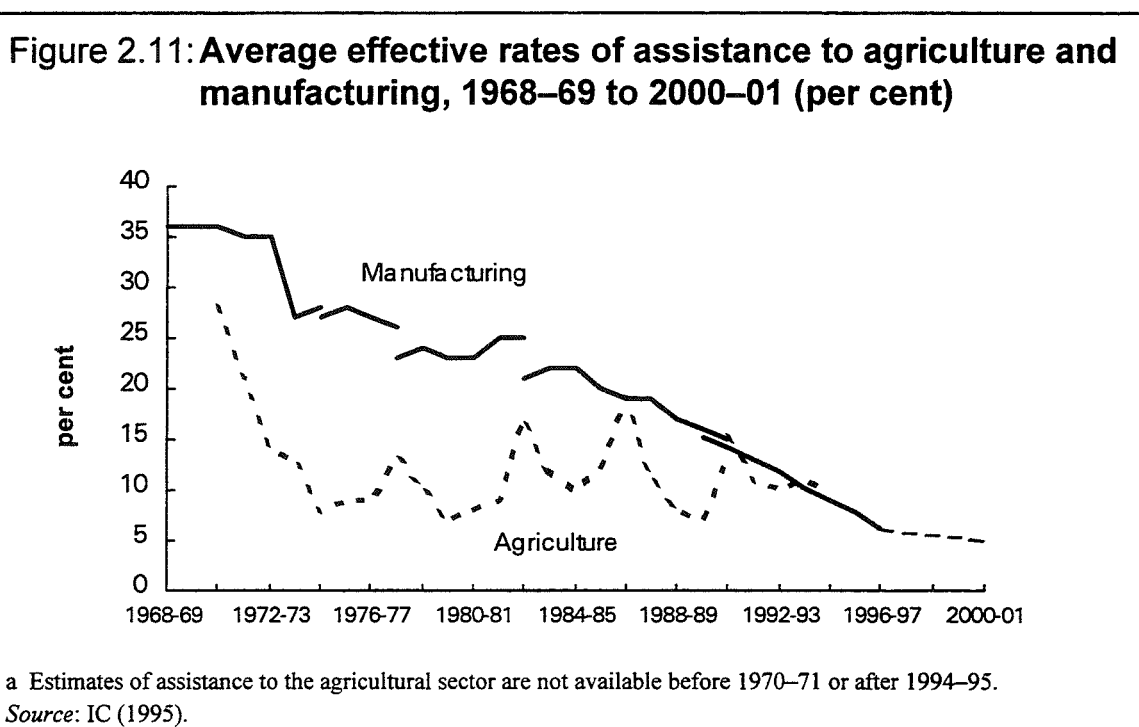
	<i>Adjustment assistance</i>	<i>Research and development</i>	<i>Domestic pricing arrangements</i>	<i>Other</i>	<i>Effective rates</i>
Horticulture	0.4	1.4	1.3	1.2	4.3
Extensive cropping	1.2	1.9	0.0	1.1	4.1
Extensive irrigation and high rainfall cropping	1.1	2.5	6.2	-0.9	8.9
Extensive grazing	2.0	1.9	0.0	0.8	4.7
Intensive livestock	1.1	2.0	47.7	0.7	51.5
Total agriculture	1.4	1.9	6.6	0.8	10.7

Source: IC (1996b).

On average, domestic price supports were the largest contributors to effective assistance in agriculture in 1994–95, but their importance varied considerably between agricultural activities. The level of price support afforded intensive livestock was well above the sector average of 6.6 per cent, mainly due to dairy price support. Other activities to receive above-average price support included tobacco (before the abolition of the tobacco industry marketing arrangements in January 1995), dried vine fruits, wine grapes and sugar (Table SA 2 in the Statistical Annex, available on request). Many of the price supports are presently being unwound or are the subject of government reviews. For example, a joint Commonwealth/Queensland Government working group is

currently reviewing the sugar industry, including an investigation of pricing arrangements and tariff protection.

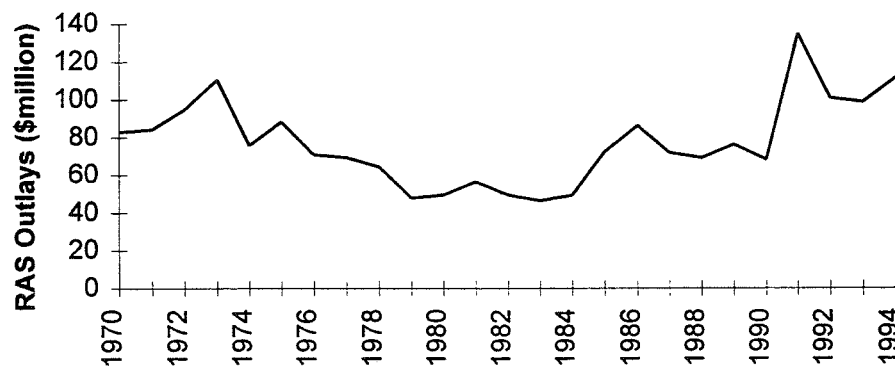
Assistance to agriculture has changed over time (Figure 2.11). The move away from cost-based price stabilisation schemes in the early 1970s is reflected in the large drop in effective assistance at the time. However, the effect on assistance of this shift was offset to some extent by the introduction of some commodity underwriting and other measures to cushion the impact of extreme deteriorations in price. Subsequent fluctuations in assistance reflect the operation of such measures. For example, the peak in 1977–78 was mainly due to outlays under the Beef Industry (Incentive Payments) Act 1977 of \$85 million, made in response to depressed market conditions in the 1970s (IAC 1983b). Fluctuations also occurred because of special payments to industry. For example, the peak in 1990–91 was due to the one-off Commonwealth Government contribution of \$300 million to the wool supplementary payments scheme.



Variability over time has also been a feature of payments made under the RAS (Figure 2.12). In terms of economy-wide prices, the level of rural adjustment support has been maintained over the period 1970 to 1994. Nevertheless, there have been substantial year-to-year fluctuations, mainly reflecting the triggering of assistance in response to market downturns or drought. Because of the

decrease in the agricultural sector's terms of trade, the value of RAS payments in terms of agricultural output prices has risen.

Figure 2.12: Real Commonwealth budgetary RAS outlays, 1970–71 to 1994–95^{ab} (1989–90 \$million)



a Real expenditures have been derived by adjusting nominal expenditure by the GDP implicit price deflator.

b Prior to 1977, expenditure was under the Rural Reconstruction Scheme.

Source: IC (1995).

As well as benefiting its recipients, assistance also affects indirectly the allocation of resources between sectors and industries. These wider effects depend on the level of assistance for an individual industry, the magnitude of that assistance relative to assistance afforded other industries, and the ability of resources to move between sectors.

While the rate of overall agricultural assistance declined in the early 1970s, it has fluctuated in the 10 to 15 per cent range since that time. Manufacturing has been the other main beneficiary of industry assistance, mainly in the form of tariffs and quotas. The average effective assistance provided to manufacturing was for many years well in excess of that provided to agricultural activities. However, with the progressive lowering of tariffs and abolition of quotas, manufacturing assistance has fallen to a level slightly below that afforded agricultural activities (Figure 2.11). Manufacturing assistance is projected to fall further to 5 per cent by 2000–01 with the planned reductions in assistance to TCF and passenger motor vehicles over that period.

2.4 Changing government involvement in rural adjustment⁴

Since the early 1970s, the level of government support for rural adjustment has fluctuated from year to year. However, the average level of assistance over the period has been maintained. This is in contrast to the ongoing reductions in assistance occurring in manufacturing.

The form in which support has been provided to the agricultural sector has changed significantly, largely because of changes in the policy environment. Increasing emphasis has been placed on encouraging farmers to become more self reliant and to adopt their own risk management strategies.

Pre-war adjustment assistance schemes

Farm adjustment assistance was introduced as early as 1935, in the form of debt reconstruction and farm build-up schemes. This assistance was introduced against a setting of high unemployment and external deficits due in part to declining commodity prices. It was intended to have two main effects: maintaining farmers' incomes at a level that would keep them on the land; and maintaining or increasing export revenue through increased production. Administration of the farm adjustment assistance was mainly a State responsibility, with the Commonwealth Government role limited to providing some of the funds. The Commonwealth discontinued payments to the States under the adjustment schemes in 1943.

Evolution of product-based market support schemes

Immediately following the Second World War, rural assistance policies generally were aimed primarily at expanding agricultural output. Policy makers regarded higher agricultural output levels as a means of raising exports and adding to the supply of foreign exchange. Various commodity marketing schemes sought to guarantee a price for farm produce based on the cost of production plus some surplus for the producer. This period saw the formalisation of what became the characteristic stabilisation scheme, based on the average cost of production for the particular commodity.⁵

⁴ The main general sources for this section are Davidson (1990), DPIE (1993), IAC (1976), IAC (1984a), IAC (1984b), Malcolm (1994), Mauldon (1976), RASAC (1996), and Stayner and Gow (1992).

⁵ Guaranteed prices were determined by assessing producers' average cost of production. Farmers paid a levy into a stabilisation fund if export prices exceeded the cost of

Through the 1960s, the basic weaknesses of the cost of production basis for determining the level of support prices became apparent. Because support prices were cost rather than demand based, farmers were encouraged to increase output without reference to underlying demand conditions. The output support, being strongly related to the quantity of the commodity produced, led to a gradual increase in the level of assistance needed to equalise returns across producers and subsidise losses incurred on 'marginal' export sales (which were required to avoid stock build-ups).

By the end of the 1960s, changes in the economy began to affect agricultural policy. Manufacturing had expanded ahead of agriculture, resulting in the relative decline of agriculture's contribution to domestic production. In addition, rapid growth in mining exports in the early 1960s lessened the dependence of the economy on the export of agricultural commodities. Growth in non-agricultural industries reduced the difficulties in absorbing workers into the non-farm sectors.

Despite the substantial government support provided to the agricultural sector, price support schemes did not solve problems associated with low incomes of some farmers. For example, the pricing policy for dairy products and the dairy product bounties did not prevent the deterioration of incomes of an increasing number of dairy farmers, wheat production and stocks were increasing, and fruit growing industries faced major over-supply problems as export markets shrank. Lack of capital and knowledge precluded the quick adoption of new technology, and often the small size of farms prevented the application of technology to realise economies of scale.

In response to changes in general economic conditions and the dependence of agricultural industries on government support, the government sought to limit the amount of financial assistance it provided to the agricultural sector.

A shift towards support for farm adjustment

The need to limit assistance signalled a change in agricultural policy. Although still prepared to provide significant assistance when prices declined drastically, governments could not sustain assistance based on farmers' cost of production. Furthermore, by the end of the 1960s, the general structure of agricultural land policy, which for a century had favoured closer settlement through soldier settlement schemes and home maintenance area legislation, had clearly become

production, while payments were to be made from the fund when export prices fell below the guaranteed price. When needed, the fund was supported by the government.

counter-productive. Small farms and policies designed to keep farmers in farming were causing social problems rather than contributing to social stability. With the exception of the short-lived Marginal Wheat Area Reconstruction Scheme of the 1930s, no assistance was specifically directed at building up the size of farming units. It was in this context that farm reconstruction schemes were reintroduced in the early 1970s.

The Government introduced farm reconstruction schemes to cope with specific agricultural crises (eg the collapse of wool prices in 1969 and the downturn in apple, pear and canned fruit export markets in the late 1960s and early 1970s). The Marginal Dairy Farms Reconstruction Scheme 1970 and the Rural Reconstruction Scheme 1971 were similar in character to schemes of the 1930s. They provided concessional loans for special purposes to certain farmers with financial difficulties. These loans were available to farmers unable to obtain finance from commercial sources and who could demonstrate reasonable prospects of continued success in farming. The assistance provided under these new schemes was mainly intended to build up the farm's land base or restructure its debts. On-farm development works were not explicitly included in the adjustment assistance framework. The provision of these funds at interest rates substantially below the general level led to long-term concessional finance being built into the notion of farm viability.

In some instances, assistance was also provided for the removal of redundant assets (Marginal Dairy Farms Reconstruction Scheme 1970) or surplus assets (Fruitgrowing Reconstruction Scheme 1972). In other instances, assistance was provided directly to farmers who left the industry (Rural Reconstruction Scheme 1971). The concept of household support — to meet living expenses and alleviate conditions of personal and family hardship while farmers considered whether or not to leave farming — was introduced with the crisis faced by beef producers in the 1970s (IAC 1975).

By the time the Industries Assistance Commission (IAC) reviewed these schemes in the mid-1970s, most of the crises had passed and the review focused on whether the schemes still had an ongoing role. If there was a role for government assistance, it was to lessen the evident weaknesses of the earlier schemes. By not providing opportunities for farmers to adjust to market-determined price incentives, these earlier schemes had not solved the rural adjustment problems. The IAC also found a lack of co-ordination and liaison between State and Commonwealth governments was leading to differential treatment of recipients.

The IAC recommended the introduction of a single, integrated Rural Adjustment Scheme (RAS). This scheme was to replace the existing ad hoc schemes and operate under a Commonwealth-State agreement to facilitate a consistent treatment of farm adjustment across different regions and activities. The IAC recognised that adjustment pressures in some areas or industries might, in exceptional circumstances, be more appropriately managed by special assistance measures. Nevertheless, it considered that any special measures should be consistent with the broad aims and provisions of the general scheme and be subject to a specific time limit.

The RAS was introduced in 1977. It provided six measures of assistance, funded in three parts (Box 2.1). Assistance under the programs of Parts A and B was generally available by way of concessional loans. The funds under Part C were initially available as a concessional advance, but could be converted to a grant if the farmer left the industry within three years. This amalgamation of features of existing schemes into a single RAS represented a consolidation of types of adjustment assistance previously offered. Nevertheless, the scheme did not include the asset removal feature of the Fruitgrowing Reconstruction Scheme nor the land bank feature of the Marginal Dairy Farms Reconstruction Scheme.

Box 2.1: Provisions of the 1977 Rural Adjustment Scheme

The Scheme comprised three parts.

Part A provided assistance in the form of concessional loans or grants to farmers for debt reconstruction, farm build-up and farm improvement. These measures were available to full-time farmers offering prospects for long-term commercial viability but who are unable to obtain commercial finance.

Part B provided advances for essential carry-on expenses payable when a rural industry was assessed as suffering a severe market downturn or similar situation (excluding natural disasters).

Part C provided rehabilitation grants (or loans) and household support assistance to farmers assessed as non-viable. To obtain a rehabilitation grant, the applicant's property needed to be purchased by another property owner who was being assisted under the farm build-up provisions of Part A. Household support was paid as an advance for one year sufficient to raise the applicant's estimated future income from all sources to a level applicable to him if he were eligible for unemployment benefits. The benefit could be extended to two years in special circumstances.

Source: DPIE (1996a).

When it was introduced in 1977, the Government identified a number of objectives for the RAS. They included the encouragement of the reallocation of resources

... to help restore to economic viability those farms and farmers with the capacity to maintain viability once achieved. (DPIE 1977d)

This objective was implemented through Part A of the scheme which supported debt reconstruction, farm build-up and farm improvement, and Part C which facilitated the exit of non-viable farmers through rehabilitation grants. A condition for support for farm build-up was that farmers could not obtain finance on 'reasonable terms and conditions' from any other source. The farm build-up and rehabilitation grant elements of RAS 1977 focused on changing land ownership, and increasing farm size and capital intensity to facilitate adjustment. The farm build-up and debt reconstruction components supplemented commercial sources of finance.

These elements of RAS were complemented by provisions aimed at farm household support. These included Part B of RAS which afforded carry-on finance to farmers facing severe market downturn or similar circumstances, but who had reasonable prospects of long-term commercial viability, and Part C, which also provided farm household support for low income farmers who were not viable in the longer term.

The IAC evaluated the performance of the 1977 scheme in 1984. It found that:

- the RAS had operated largely as an adjunct to the commercial finance market, but there was no evidence that it had improved the efficiency of that market;
- lenders in the regulated commercial credit market had probably benefited by virtue of the reduced default risk which resulted from the over availability of RAS finance to some farmers;
- the States had so far retained a significant proportion of the concessional funds paid out under the States Grants (Rural Adjustment) Act;
- farmers assisted by the scheme did not fall into any well-defined group; and
- although gaps in Australia's social welfare system were inevitable, there was no evidence that the scheme filled those gaps by offering general welfare support to low-income farmers. Some of the assistance provided through concessional credit had probably been capitalised into land values.

The Commission concluded that RAS 1977 did not fulfil the Government's stated objectives and it cast doubts on the usefulness of the RAS from a national

viewpoint. However, the scheme could not be assessed in isolation from the environment in which agricultural policies were implemented. There was the possibility that the abandonment of the RAS would lead to its replacement with more costly ad hoc assistance measures. The review recommended that the RAS be discontinued as a generally available scheme, but that its programs be available to farmers in a specific industry, region or other appropriate grouping as determined by public inquiry. Despite these recommendations, the Government made no major changes with the introduction of new legislation in 1985.

The re-orientation of RAS towards improved farm management

The Government implemented changes to the RAS in 1988 after a consultant's review. The announced intention of RAS 1988 was to allow it to operate

... in a more flexible and innovative way so as to address more adequately the changing structural adjustment forces acting on businesses in the agricultural sector. (Kerin 1988)

Within this broad direction, the focus on long-term viability was strengthened:

The third key policy aspect is that there is to be a much stronger emphasis on the notion that farming is first and foremost a business — which must be run along sound business lines if it is to survive and prosper. (Kerin 1988)

To improve the quality of financial analysis available to the farmer, RAS 1988 included a Farm Financial Management Skills Program under Part A of the scheme. Grants were made to farmers for training and obtaining advice to improve performance and profitability of their farm enterprise by improving their managerial, husbandry, technical and financial knowledge and skills, and by seeking professional advice in these areas. The new scheme also included drought assistance as a provision under Part B to coincide with the exclusion of drought from the schedule of national disasters. The rehabilitation grant in Part C was also replaced by a re-establishment grant to non-viable farmers wishing to leave farming. The new provision did not link receipt of a re-establishment grant with the sale of the recipient's farm to another farmer receiving farm build-up assistance under Part A, as had been the case previously. The farm household support provisions remained for low income farmers considering leaving agriculture.

Another review preceded the introduction of RAS 1992 (Box 2.2). This new scheme recast the earlier farm build-up and debt reconstruction elements of RAS (Part A) as explicit productivity improvement measures. The intention of the RAS 1992 was to improve the effectiveness of management of the farm

businesses through productivity growth and farm adjustment. This objective was implemented through interest rate subsidies for on-farm productivity improvements, grants for skill enhancements and professional advice, and re-establishment grants for non-viable farmers leaving agriculture. The focus on productivity and long-term viability was elevated by making eligibility for an interest subsidy conditional on the farm being eligible for commercial finance. This provision was not included in previous schemes. The new arrangements also explicitly linked the National Drought Management Strategy into the RAS through 'exceptional circumstance' provisions. To provide a national strategic view of the RAS, the Government established the Rural Adjustment Scheme Advisory Council.

Box 2.2: Provisions of the 1992 Rural Adjustment Scheme

RAS 1992 provided a single scheme to replace Parts A, B and C of the earlier scheme. The key elements of the 1992 scheme are:

- grants or loans to the farm enterprise for farm management training and professional advice;
- interest subsidies up to 50 per cent of the cost of commercial finance to eligible farm enterprises for increased productivity growth of the farm unit;
- a re-establishment grant of up to \$45 000 paid to farm owners who have elected to leave the industry because their farm enterprise is no longer viable, with the grant being subject to a farmer asset test (excluding household and personal effects) and payable after the sale of productive farm assets (although payment can be made before the sale under certain circumstances);
- special interest subsidies, up to 100 per cent, to provide additional support for productivity improvements, carry-on finance and debt reconstruction for farm enterprises experiencing exceptional circumstances; and
- an additional re-establishment grant of \$30 000 payable to farm owners who have elected to leave the industry and are located in exceptional circumstance areas.

Source: DPIE (1996a).

In all of its forms, RAS has contained a combination of elements that are intended to hold some farmers in agriculture while supporting others to leave. In RAS 1977, the emphasis was on reducing the number of farms and making marginal farms more profitable by increasing their size and capital intensity, and improving the structure of their debts. Concessional finance and grants supported this process. In subsequent schemes, the focus on long-term viability was progressively strengthened. The emphasis on solutions, such as improving capital structure and increasing farm size and capital intensity, was replaced by

an emphasis on productivity enhancement. Throughout, these elements of RAS were designed to facilitate adjustment.

On the other hand, the RAS has also included income support/carry-on elements and related social welfare programs. These elements have the potential to slow down or prevent adjustment. In particular, Part B of RAS 1977 and 1988 and the exceptional circumstances provisions of RAS 1992 were directed explicitly at keeping farmers in the sector during hard times. Both have been supplemented at various times with additional special payments to farm businesses. In addition, the facility to maintain farm household support payment as a loan (initially under Part C of RAS and later as the separate Farm Household Support Program, see Box 2.3) has provided some farmers the option of remaining in agriculture after their farm business has ceased to be viable, while hoping to repay the loan component at a later date. Because of a very low level of uptake, this provision was withdrawn in the 1996–97 Commonwealth Budget.

The RAS 1992 included a termination clause and the requirement for a Mid-Term Review.

Box 2.3: RAS related rural welfare programs

Farm Household Support and Drought Relief Payments are RAS related welfare programs administered by the Department of Social Security (DSS) on behalf of the Department of Primary Industries and Energy (DPIE).

Farm Household Support (FHS) (*Funding withdrawn from 1996-97*)

FHS was paid as a loan to farm households to meet day-to-day living expenses. To be eligible for FHS, the farm enterprises had to have been certified as being unable to access further commercial finance. Income and asset tests applied, with farm assets, life insurance and superannuation held by the farmer being excluded from the test. The payment was equivalent to the Job Search Allowance (JSA) and could be made for a period of up to period of two years. If the household elected to stay in the industry, the loan was repayable. If the farmer left the land prior to receiving two years of payments, the first nine months were converted to a grant. Farmers who left the industry may also have been entitled to apply for a re-establishment grant (or enhanced re-establishment grant) under RAS 1992.

Drought Relief Payment (DRP)

DRPs are made to farm households to meet day-to-day living expenses. To be eligible for DRP, the farm enterprises must be certified as being in an exceptional circumstances drought effected area. Income and asset tests apply, with farm assets being excluded from the assets test. The payment is equivalent to the JSA. Payments continue while the exceptional circumstance declaration is in force and, subsequently, for a recovery period of six months.

Source: DSS (1995).

3 FACTORS INFLUENCING GOVERNMENT SUPPORT FOR RURAL ADJUSTMENT

3.1 Introduction

As outlined in the previous chapter, government support for rural adjustment has been a feature of Australian agriculture for many years. However, the level and form of support has varied considerably over time in response to changing economic conditions and changes in the government policy environment.

This Mid-Term Review provides an opportunity to assess the efficacy of the existing arrangements in the light of current circumstances. This should involve consideration of whether there are significant rural adjustment problems that warrant government action and, if so, the most efficient form of government intervention.

This chapter addresses the first of these issues. The second is dealt with in the next chapter. This chapter briefly outlines some rationales commonly used to support rural adjustment assistance and, where available, relevant empirical evidence. As a precursor to this, the following section discusses the emphasis placed on efficiency in RAS 1992.

3.2 Efficiency perspective of RAS

Previous rural adjustment programs have had objectives relating to both industry efficiency and income support. However, the stated objective of RAS 1992 is primarily on productivity and efficiency:

The objective of RAS '92 is to encourage the development of a more resilient and self reliant farm sector in the face of international competition and ongoing and inevitable structural adjustment and seasonal variation. RAS '92 has moved away from assisting farmers in trouble and towards improved farm productivity, profitability and sustainability, or farm exit.

RAS '92 places much greater emphasis on actively helping the process of structural adjustment, and in particular helps farmers to adopt productivity measures to help them respond to change, before they get into long-term difficulty. (DPIE 1996a)

Structural change is a feature of all sectors of the economy. It reflects adjustments made by firms in response to on-going changes in market conditions — such as changing input costs, output prices, the development of new products and new technologies, changing consumer tastes and social attitudes — and changes in government policies. Structural change is essential if our economy is to fully capitalise on its resource base and provide higher living standards.

The pressures for adjustment vary over time and between industries. The exposure of agricultural activities to considerable climatic variation and to fluctuating prices may result in them facing different adjustment pressures from those in other industries (Chapter 2). However, to the extent that such pressures merely reflect the environment in which agricultural activities operate, the pace of change — and differences within and between agricultural activities and between the agricultural and non-agricultural sectors — should not be a primary focus of economic policy. From an economic efficiency perspective, the major concern should be to ensure that change which enhances efficiency is not inhibited by factors within government control.

The adjustments that need to be made by most industries presently take place without sector or industry-specific assistance. Consequently, to warrant government support directed specifically at rural adjustment, it needs to be demonstrated not only that there are factors impeding adjustment, but that these factors (or their incidence) are capable of being overcome by the measures in question. Industry-specific interventions may be a desirable way of dealing with more general problems when more broadly-based solutions are difficult to implement. However, a broadly-based solution will generally be preferable.

Factors which have sometimes been regarded as impeding adjustment in agriculture include certain barriers to entry and exit, information gaps, and government interventions in other sectors of the economy. There is also a rationale for rural adjustment assistance on welfare grounds. Each of these matters is discussed below.

3.3 Barriers to entry or to changing activity

Adjustment is impeded if there are obstacles to the entry of new farmers or to changing the size or mix of activities undertaken by existing farm businesses. The operations of the capital market and the regulation of agricultural activities and resource use have been cited as possible obstacles to agricultural adjustment.

Availability of capital

In the past, the availability of capital was frequently identified as a major impediment to agricultural adjustment. More specifically, it was often argued that government regulation of the capital market had the effect of restricting the supply of funds to the agricultural sector, thus limiting entry and opportunities for expanding existing farms. However, during the 1980s, there was considerable deregulation of Australian capital markets. Consequently, regulatory limitations that previously may have affected the supply of debt or equity finance to the agricultural sector have now been reduced substantially or eliminated.

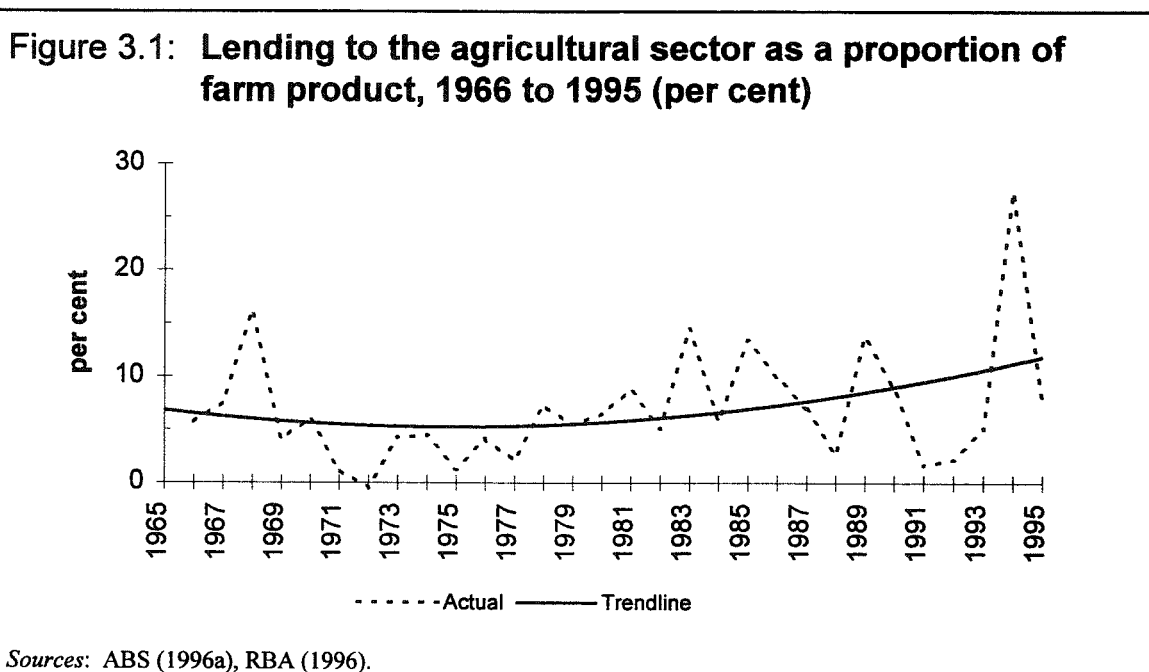


Figure 3.1 shows the pattern of agricultural lending by banks and other financial institutions between 1966 and 1995 relative to agricultural output. The most pronounced feature is the volatility of lending relative to agricultural output.¹ Although the volatility tends to obscure the underlying trend, there appears to have been a distinct upward trend in lending to the agricultural sector since the late 1970s.

¹ The volatility is attributable to two factors — variations in the level of agricultural output and fluctuations in total borrowings.

A recent survey of bank lending to small business (RBA 1994) also provides some (albeit indirect) information about restrictions on external agricultural borrowings.² The survey found that rural borrowers were generally satisfied with the level of service from their bankers.

Small businesses often express the general view that banks are letting them down and inhibiting their growth but individual experiences with banks tend to be more satisfactory. (RBA 1994, p. 37)

Significantly, the survey found that rural borrowers recorded higher levels of satisfaction than their metropolitan counterparts. Such an outcome would be less likely if there were significant constraints on agricultural lending.

On the supply-side of agricultural finance, there are a number of institutions with a strong rural presence whose lending to the sector outstrips the sector's share of GDP. Among commercial banks, there is some variability in lending commitment to the sector and their incidence of debt writeoffs. For example, in 1995, loans to agriculture accounted for 6.9 per cent of outstanding loans by the National Australia Bank (NAB 1996). The corresponding figure for the Commonwealth Bank of Australia was much lower — 3.9 per cent (CBA 1996). The variation in write-offs of agricultural debt was greater. Agricultural debt write-offs as a proportion of all doubtful debt was 0.6 per cent for the National Australia Bank and 2.5 per cent for the Commonwealth Bank. This variability points to significant differences in banks' exposure to agricultural borrowings, and could also imply differences in the nature of the risks which particular banks are willing to finance. It also suggests that there is scope for farm owners to 'shop around' to obtain financial backing. Nonetheless, it is clear that there will be limits to the risks that banks are prepared to finance. Thus, the fact that some farmers cannot attract funding does not necessarily indicate a general problem or barrier to adjustment.

Agricultural sector regulation

Barriers to entry can also arise from regulations governing the use of land, farm inputs and marketing arrangements. Schemes which broke up large tracts of land were developed to meet specific land settlement objectives such as soldier settler programs. Regulations limiting the size of holdings also supported closer settlement policies. In some regions, there are limits on the use of farm inputs such as location-specific irrigation water entitlements or land allocated to specific crops (eg sugar). These were introduced for conservation objectives or to restrict volumes of products entering the market, but they have also restricted

² A significant proportion of agricultural investment is financed by equity contributions.

the use of farm resources generally. Market entitlements also have been used to limit the supplies entering the market and thereby raise prices.

These forms of regulation restricted farmer options for adjustment in the agricultural sector. One government response has been provided through RAS and earlier adjustment schemes. Now many of these regulatory arrangements have since been dismantled or extensively modified. Unless the Review Committee can find evidence of significant regulatory impediments remaining, government involvement in rural adjustment on these grounds is difficult to justify.

3.4 Barriers to exit

Rural adjustment involves exit as well as entry. Indeed, the number of farmers overall has been falling steadily for many years. It is therefore pertinent to ask whether there is evidence of substantial barriers to exit that warrant government intervention. Exit may involve leaving one activity on a farm for another, or leaving the farm altogether.

A number of factors may act as barriers to exit.

First, agricultural land holdings are lumpy assets and their most likely buyers are neighbouring land holders (particularly if the land for sale would be sub-economic as a separate business). While other farmers in the same locality, intent on building up their agricultural enterprise, may provide the most likely source of demand, local buyer interest (and offer prices) may be sensitive to the timing of the sale. This may limit an individual farmer's immediate exit prospects. An issue for review is the likelihood and extent of 'stickiness' in the agricultural land market. Another is whether such a stickiness is different in nature from that of asset sales in other industries.

Second, some farm fixed assets may be site-specific and of limited use to other farmers (eg tobacco leaf drying kilns, piggeries, fruit trees and milking sheds). Thus, a farmer may find few, if any, buyers for some secondhand equipment and other on-farm assets, and be faced with a capital loss in the case of exit. This prospect could be sufficient to deter, or defer, exit.

In the past, ad hoc assistance packages have been provided from time to time to write off such assets (eg to remove fruit trees, write off redundant assets in the amalgamation of dairy farms, or reduce flock sizes). An issue for review is whether the gap between acquisition costs of new agricultural assets and disposal values which leads to asset fixity differs in nature from asset fixity in

other industries and is of sufficient magnitude to warrant separate government action.

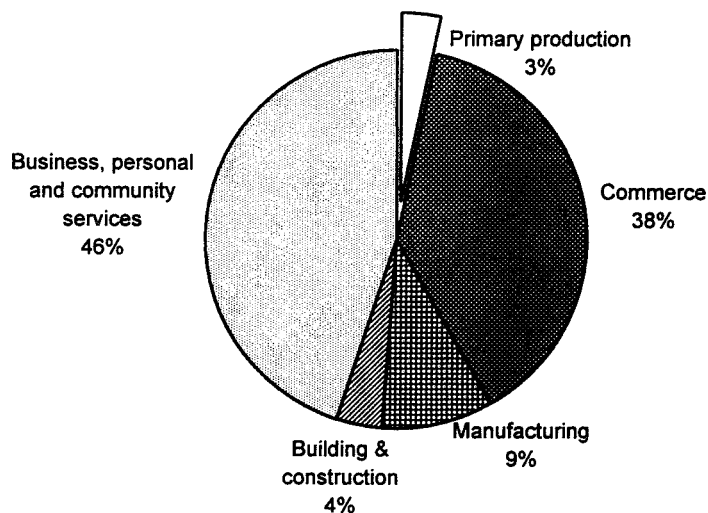
Third, a farmer may lack the information necessary to know or fully appreciate the limitations of his/her operation or (better) alternatives elsewhere. Such an information gap would act as a barrier to exit. Information gaps are addressed in the following section.

While the factors outlined above could impede exit, and hence adjustment, it is not clear that they represent significant obstacles. Moreover, it is likely that many other industries (eg those with large sunk costs) could claim that they face similar barriers to exit.

Bankruptcy statistics shed some light on the incidence of forced exits from the agricultural sector. They do not suggest that there are greater difficulties in exiting from agriculture than from other sectors. For instance, for the period 1989–90 to 1994–95, primary industries contributed around 3 per cent of total bankruptcies. This is roughly equivalent to their contribution to GDP. Most bankruptcies were associated with firms involved with commerce, and business, community and personal services (Figure 3.2).

This finding would not hold if agricultural businesses are inherently more risky than those in the rest of the economy. However, it is not clear that this is the case. Banking data do not suggest any significant difference in the incidence of bad debts between agricultural and non-agricultural activities (CAB 1996, NAB 1996). Furthermore, the average level of long-term debt to equity (ie the 'gearing' ratio) for agriculture is around 10 per cent (ABS 1996c). This is low by general industry standards — the average for manufacturing enterprises is around 50 per cent, and for mining 66 per cent. However, the measure of average indebtedness does not provide an indication of the distribution of the debt. Despite the relatively low average, there are likely to be farm enterprises that have relatively high gearing ratios.

Figure 3.2: Sectoral incidence of bankruptcies, average 1989–90 to 1994–95 (per cent of the total number of bankruptcies)

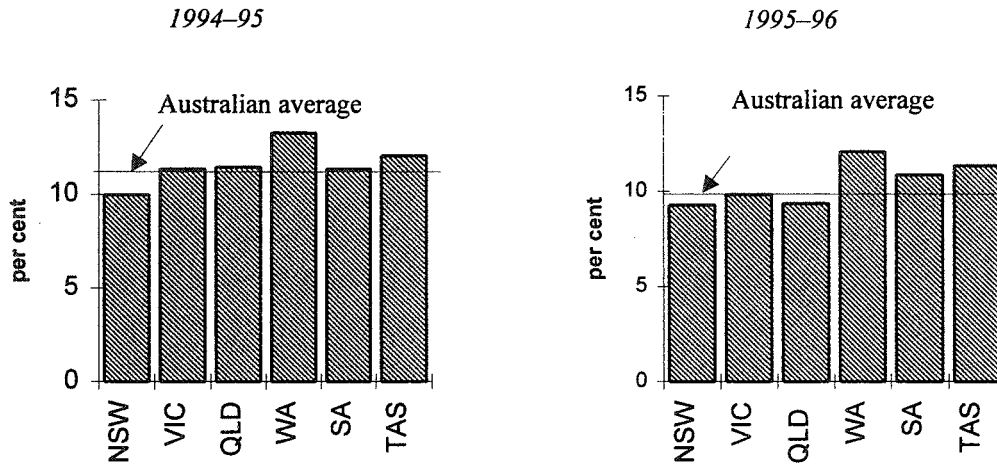


Source: Inspector General in Bankruptcy (1995).

Information about farm land sales also suggests that there are no significant barriers to exit from agriculture. The information, taken from the ABS register of agricultural establishments for the years 1994–95 and 1995–96, indicates that around 10 per cent of agricultural establishments sell part or all of their land holding in any one year (Figure 3.3).

While agricultural conditions and the mix of activities differ between States, they do not translate into large differences in the incidence of land sales between States. For example, Western Australia had the largest proportion of farms selling land in both years examined (13 per cent in 1994–95 and 12 per cent in 1995–96). New South Wales had the lowest proportion (10 per cent and 9 per cent, respectively).

Figure 3.3: Farms selling land, as a percentage of the number of farms in each State and Australia (per cent)



Source: ABS (1996d).

As with the bankruptcy statistics, there is no benchmark against which to compare these sales levels. However, a 1996 industry survey (PC/DIST 1996) of around 400 000 non-agricultural enterprises provides some basis for comparison. This survey revealed that 15 per cent of these enterprises which had operated for less than 10 years, and 13 per cent of enterprises which had operated for ten years or more, expected to exit in the next three years. These exit rates are broadly consistent with the ABS information about farm land sales.³

The ABS survey data reveal that the incidence of land sales in drought affected areas is slightly lower than in drought-free areas (ABS 1996d, DPIE 1996b). While this could be interpreted as lending support to the proposition that farmers tend to hold onto land during bad times, it is also consistent with farmers not selling due to farm household drought support payments made under the RAS and Drought Relief Payments.

³ Disaggregation of the data by farm size (based on the estimated value of agricultural output) showed that the number of farms selling land as a proportion of all farms was highest for the smallest and largest farm size categories (see Statistical Annex, available on request).

3.5 Information gaps and asymmetries

To make appropriate decisions about the future of their enterprises, farmers need to be aware of the uncertainties associated with farming. They also need to be proficient at evaluating and managing their exposure to risk. For example, variable climatic and market conditions provide farmers with both good times and bad times. The greater the variability and uncertainty, the larger the difference/duration of exceptional profits/losses.

Information collection can be costly and holders/generators of information may not always disclose new information, or may disclose it in a form not easily recognised or processed by farmers. However, on the face of it, individual farmers have compelling incentives to obtain information commensurate with the risks they face in order to evaluate alternative strategies. Moreover, with the introduction of new technologies (especially personal computers and software packages designed to facilitate farm management) and improved communications systems, it is likely that farmers now have far greater access to information than they did in the past. Nonetheless, if there is inadequate information, farmers may not make viable longer-term decisions concerning entry into new markets, adoption of new production techniques and land uses, or the withdrawal of household labour, capital and land from declining agricultural activities or from farming altogether.

A key issue for review is the nature and extent of information gaps which remain and whether the government has a role in overcoming those gaps. A further issue is whether the RAS is the appropriate vehicle for doing so (eg by providing training to help farmers access relevant information), or whether they are better provided through other means (eg through the services of agricultural research and development corporations or marketing authorities). Where the individual farmer is the prime beneficiary of the service, it would be more efficient to deliver the information in question on a fee-for-service basis.

3.6 Relationship with other interventions

In the past, some argued that rural adjustment assistance was justified to compensate for costs imposed on the agricultural sector by other government policies, in particular assistance provided to manufacturing industry. It has also been claimed that the provision of RAS assistance has avoided or reduced the resort to other, less efficient, forms of assistance to the agricultural sector.

Compensation for other policies

Assistance to manufacturing has been wound back from an average of over 35 per cent of manufacturing value added in 1968–69 to around 9 per cent in 1994–95. With phased reductions in the levels of assistance provided to the relatively highly assisted passenger motor vehicle, clothing, textile and footwear industries, manufacturing industry assistance is likely to fall to an average of around 5 per cent by the year 2000.

Following the reduction in manufacturing industry assistance that has occurred over the last two decades, claims that agriculture currently is penalised by assistance afforded manufacturing cannot be substantiated. Indeed, as shown in Chapter 2, assistance provided the agricultural sector (10.7 per cent in 1994–95) now exceeds the average level of assistance provided to manufacturing. The planned reductions in manufacturing assistance between now and the year 2000 will accentuate this discrepancy.

Whatever the possible justifications for the RAS, it would be inappropriate to use it as a means of compensating farmers for the adverse effects of assistance or other forms of government intervention applying elsewhere in the economy. If there are concerns about the impact of such government interventions on agricultural activities, the most appropriate course of action would be to evaluate directly the efficacy of the relevant interventions.

Avoiding inferior agricultural policy options

Another rationale for RAS is that it provides an adjustment framework that has fewer distortionary impacts than many measures which might be used if RAS were not available. For instance, with rural adjustment programs in place nearly all price stabilisation, underwriting and market support programs have been eliminated. Nevertheless, the presence of RAS has not been entirely successful in containing demands for, or the provision of, additional welfare support. For example, even with social welfare and exceptional circumstances components in place, special Drought Relief Payments were introduced in 1994–95 to assist farmers cope with the continuing drought in New South Wales and Queensland. Similarly, fodder subsidies have on occasions applied in parallel with RAS.

An issue for review is whether the RAS continues to deflect demands for additional support, or whether it has merely provided an institutional platform for mounting requests for support at the expense of programs initiated by farmers themselves.

3.7 A welfare rationale for rural adjustment assistance

Aside from the possible efficiency reasons for adjustment assistance, there may be a welfare rationale for it as a safety net in bad times. In recent times this has been recognised explicitly in the case of drought, where support in exceptional circumstance (such as drought) under the RAS has typically been complemented by special Drought Relief Payments (DRPs).

The DRP scheme was introduced as a parallel scheme to the Job Search Allowance (JSA). The DRP scheme, on paper at least, relaxed some of the eligibility requirements associated with the JSA (Box 3.1). The combination of RAS support for exceptional circumstances (EC) and DRP substantially improved the available income of EC recipients in Queensland and NSW in 1995–96 (Box 3.2).

If welfare support is to be justified within an adjustment framework which focuses on improving efficiency, two criteria should be satisfied.

The first requirement is that the welfare support should be delivered in a way that minimises negative feedbacks onto efficiency. In particular, it should not significantly undermine the self-reliance of the farming sector.

The second requirement is that sector-specific welfare support should not set up any major inequities and/or adverse incentives in the way that it interacts with the general social security system. Indeed, a key threshold question is why a sector-specific safety net would be required at all. There is the potential for some farm families failing to meet the asset and/or income tests applying in the general schemes, yet being worse off than some non-farm families who qualify under the general schemes. Alternatively, it could be that farm families receiving welfare under the RAS, while facing particularly difficult circumstances, may be no worse off than the non-farm families who do not qualify for general welfare assistance. This issue would need to be reviewed if a welfare rationale is to be established.

Box 3.1: Eligibility requirements for the receipt of Job Search Allowance and Drought Relief Payments,^a 1996

<i>Job Search Allowance (JSA) (unemployment benefits)</i>	<i>Non-farm business owner</i>	<i>Farm business owner (DRP)</i>
Threshold criteria		
- unemployed	as for JSA	farmer, hence no activity test, CES test or training test
- registered at CES	as for JSA	living in EC area
- satisfy activity test (ie person actively seeking work, willing to accept employment)	as for JSA but with the additional condition that low business returns do not indicate unemployment.	condition waived
Prepared to participate in training	as for JSA	condition waived
Income test	as for JSA	as for JSA
Full allowance for couples with less than \$ 289 per fortnight;		
No allowance for couples with income greater than \$496 per fortnight		
Asset test (on non-residential assets)	as for JSA	modified asset test: as for JSA, but excluding farm assets.
Limit for couples that are home owners-\$176 000		

^a The Job Search Allowance is referred to as the Newstart Allowance from September 1996.

Source: DSS (1995), DSS (1996).

Box 3.2 Effects of Exceptional Circumstance (EC) and Drought Relief Payments (DRP) on farm income, 1995–96

The RAS Management Information System has been used to provide information on the average level of farm income of farms receiving EC assistance in 1995–96. This information has been combined with eligibility requirements for DRPs to examine the effects of government support on farm income for an average individual holding. The analysis does not include effects of support on multi-period (or farm life cycle) income that would be relevant to assessing the longer-term viability of a farm enterprise, or the effects of off-farm income on farmer creditworthiness.

The analysis shows that the cash income of farmers receiving EC support can vary substantially from large negative values (less than -\$100 000) to large positive values (over \$100 000). The average farm income of EC recipients in 1995–96 was estimated to be -\$34 414 in New South Wales and -\$11 697 in Queensland. The average level of approved EC assistance in that year was \$22 470 and \$16 213, respectively. Taking the average farm cash income and the average value EC payments, and assuming no off-farm income and that off-farm asset tests are satisfied, the annualised benefits of government support to an individual holding and estimated total income^a are:

	<u>NSW</u>	<u>QLD</u>
Farm cash income	-34 414	-11 697
EC assistance	22 470	16 213
Adjusted farm cash income	-11 944	4 516
DRP benefits:		
Job Search Allowance	15 023	14 325
Family payment	3 149	3 149
Austudy	3 656	3 656
DRP total payment	21 827	21 129
Total income	<u>9 883</u>	<u>25 645</u>

^a Benefits are based on a couple with two children, one between the ages 13–15 and one 16–17 years of age. EC support for an average farm in Queensland returns a positive cash income with DRP payments providing additional income in the current period. In New South Wales, EC support alone does not raise on-farm income to positive levels on average, although with the addition of DRPs estimated income becomes positive.

Source: DEET (1995), DPIE (1996b), DSS (1995), DSS (1996) and Keating (1994).

3.8 Conclusion

This chapter casts doubt on whether the RAS has enhanced efficiency, although it is not possible to be conclusive on this issue without a more comprehensive study. It is unlikely that there are significant regulatory impediments to adjustment by the agricultural sector. Similarly, it is unlikely that some other barriers to adjustment are significantly worse than in other sectors. While RAS may have enabled governments to avoid some less efficient forms of assistance for the agricultural sector, much of such assistance remains in place. Nevertheless, if it is found that the agricultural sector has unique adjustment problems, it would then be necessary to assess whether the measures incorporated in RAS 1992 are the most effective means available to address the problems. This issue is taken up in the next chapter.

4 PROGRAM PERFORMANCE

4.1 Introduction

The effectiveness of the RAS depends on its underlying design principles, the likely effects of each of its measures and the feedback effects of some components on others.

This chapter initially examines the effect of the RAS (and other relevant farm characteristics) on farmers' decisions to buy and sell land (Section 4.2). It subsequently discusses key components of the RAS scheme, assessing them against the rationales for intervention discussed in the previous chapter and commenting on their effectiveness in meeting their stated objectives (Sections 4.3 to 4.7). Section 4.8 provides a conclusion to the chapter.

4.2 Linking rural adjustment with government support

The impact of RAS 1992 on productivity growth and farm adjustment cannot be observed in isolation from a wide range of other influences on farm adjustment and farm performance. Regression analysis provides one method of separating the possible influence of RAS from the influence of other factors.¹

A key question is how adjustment experience is to be measured. Adjustment in the agricultural sector can cover changes in on-farm resource use to improve the productivity and profitability of a given activity, changes in resource use among different activities within agriculture, or changes in resource use between agriculture and other sectors (Chapter 2). In many cases the adjustment will be accompanied by a land transaction, since this adjusts the use of the key resource — agricultural land. Land transactions are no longer a direct focus of RAS 1992, as they were of earlier RAS programs aimed at encouraging rationalisation. Nevertheless, the history of agricultural adjustment shows that land transactions — the ability to expand and contract holdings of different

¹ Regression analysis is a statistical technique that involves estimating from a set of data how an observed outcome is correlated with, and hence may be dependent on, a set of (independent) characteristics. In doing so, the technique ignores that component of variation in each characteristic that is shared with other characteristics.

types of land to meet the needs of different agricultural activities — remains a key feature of successful agricultural adjustment and structural change.

The specification of the regression analysis is described in Box 4.1.

Box 4.1: Specification of regression analysis

An important perspective on the capacity of the agricultural sector to adjust is the relative ease with which farmers can vary the size of their land holdings and how government assistance might influence changes in land ownership.

To investigate these issues, data from the ABARE surveys of Australia's broadacre agriculture and dairy farms were used in a cross-sectional regression to analyse the effects of RAS payments and a number of other farm characteristics (the independent or explanatory variables) on the likelihood of farmers: purchasing land; selling land; both purchasing and selling land; or neither purchasing nor selling land (the dependent or explained variables). In addition to RAS payments, the other characteristics examined in this analysis covered finance and production characteristics of farms and the age of the owner/managers.

Farms were classified by State and further divided into three size groups in order to examine the effect of farm size. The three size groups were farms with total cash receipts of less than \$100 000, farms with receipts between \$100 000 and \$200 000, and farms with receipts over \$200 000. Additional details of the analysis are provided in Appendix B.

Ideally, analysis such as this should estimate the separate influence of each category of RAS expenditure. In practice, the information collected by ABARE on government payments to farmers is only available in a composite form. It covers RAS interest rate subsidies, interest rate subsidies for exceptional circumstances, training and professional assistance and RAS-related drought relief family support payments. The item also includes drought-related fodder, water and freight subsidies. Although these are not a component of RAS, they are likely to be highly correlated with RAS drought payments and thus their inclusion should not greatly bias the results. Finally, the government assistance item includes non-drought related 'other' assistance not separately identifiable in the ABARE survey. Although this covers items that are not RAS-related, at the very most they comprise only 25 per cent of the total assistance (and ABARE's assessment is that they probably comprise a great deal less).

The measure of government assistance used in the regression analysis is dominated by RAS and RAS-like payments paid to farmers who stay on the

land. It does not include re-establishment grants, the key RAS component designed to assist non-viable farmers to leave the land. For this reason, the regression analysis should not be expected to find that government support (as measured) increases the probability of land sales. The question is whether it facilitates land purchases (perhaps in conjunction with sales) as a way of affecting farm-level adjustment, or whether it is associated with inaction.

The primary objective of RAS 1992 is to promote productivity and efficiency, and hence to facilitate adjustment. Nevertheless, RAS 1992 still contains farm household support measures which may have the effect of holding farmers in place and thereby slow or prevent adjustment. The analysis cannot separately identify the influence of these two types of assistance. It can, however, identify which effect dominates.

The key finding is that, as received government support increases, the likelihood of buying land decreases, while the likelihood of inaction (ie neither buying nor selling) increases (Table 4.1). In size terms, if government assistance received increases by one per cent, the likelihood of farmers buying land (as opposed to doing anything else) is estimated to fall by 0.45 per cent (row 2, column 1). If received assistance increases by one per cent, the likelihood of farmers neither buying nor selling land (as opposed to making some kind of transaction) is estimated to increase by 0.21 per cent. As expected, received assistance has no significant impact on the likelihood of selling land. It also has no significant impact on the likelihood of both buying and selling land.

A number of other factors appear to have an influence on land trading patterns. The likelihood of land purchase is estimated to increase as non-farm income increases (row 5). Diversification in the sources of income can facilitate expansion, and hence adjustment. The likelihood of purchase, either alone or in conjunction with land sale, is also estimated to increase with the value of the land being purchased (row 7). This is likely to reflect the predominance of expansions to acquire better quality land.

Some factors appear to have a greater influence on land trading patterns than does receipt of government assistance. These include cash receipts, indebtedness, and capitalisation of holdings. Business indebtedness is significant for farms buying land, and for those selling. However, the possible interpretation differs. In the case of land purchases, an increase in indebtedness (measured at the end of the financial year) appears to increase the likelihood of

Table 4.1: Responsiveness of farm land trading status to farm characteristics^{ab}

<i>Explanatory variables</i>	<i>Probability of buying land</i>	<i>Probability of selling land</i>	<i>Probability of buying and selling land</i>	<i>Probability of neither buying nor selling land</i>
Family/ operator labour	5.46			-1.20
Gov't assistance received	-0.45			0.21
Total cash receipts	-2.92	2.34		
Total farm business debt	1.41	1.62		-0.48
Total non-farm income	0.97			
Total capital	2.64	-4.71		
Value of land purchased	0.32		0.35	
Operator/ manager less than 40 yrs		-0.83	0.77	
Operator/ manager more than 60 yrs				0.39
Dummy for medium size group	0.41	0.87	na	

na not applicable

a Responsiveness is measured by elasticities evaluated at sample means. In each column, the elasticities measure the percentage change in the likelihood of that farm transaction occurring (as opposed to any other type), in response to a one per cent increase in that farm characteristic (eg government assistance or proportion of managers less than 40 years).

b Explanatory variables are only included if they are found to be statistically significant (see Appendix B).

Source: Industry Commission estimates.

farmers having brought land at sometime during the year (row 4, column 1). In practice, the causation is likely to be the other way around — the link between higher debt and land acquisitions may simply reflect the use of borrowings to finance the land purchases.² This latter interpretation is supported by evidence from ABARE (1996) showing that in all agricultural activities, the predominant use of loans is for land purchases. However, indebtedness is also positively related to sales (row 4, column 2). In this case, the regression analysis may be

² The coefficients on cash receipts and total capitalisation are also likely to be measuring reverse causation.

capturing more accurately the likely causation — for farms with higher debt levels, land sales may be a means of managing or reducing their indebtedness.

Labour supply and demographic factors are also significant for some categories of adjustment. For instance, the greater the input of family labour, the more likely are land purchases. Also, the likely incidence of farmers neither buying nor selling land increases with the proportion of operator/managers over 60 years of age (row 9, column 4), while an increase in the proportion of farmers under 40 years of age reduces likely incidence of farmers only selling land, but increases the likely incidence of them both buying and selling land (row 7).

Overall, the analysis suggests that adjustment via land trading is occurring primarily for reasons that are not directly related to the receipt of government support. While it has not been possible to isolate the effects of the components of RAS individually, the study indicates that for farms actively engaged in adjustment through changes in land ownership, received government assistance is either not significant, or is related negatively to farm adjustment. Government support for adjustment is positively related to inaction.

This analysis is submitted in order to contribute to the discussion of rural adjustment policy and the broader effects of those policies. It indicates that farmers receiving higher levels of government support are less likely to buy land, while more likely neither to buy nor sell. The nature and extent of government support on farmer behaviour is not, however, directly identified in the analysis.

Looking behind the results, if rural adjustment and related welfare programs slow the rate of land trading, they also limit the opportunities for those willing and able to adjust through the acquisition of new land. Such programs may also bias adjustment towards those projects that make use of farmers' current land holdings or non-agricultural activities. However, it is important to know the contributions of each component of RAS to the overall result.

While it is not possible to analyse these components separately using ABARE data, it is possible to examine in qualitative terms the nature of the individual components of RAS and related welfare programs to assess their likely effects on the direction and efficiency of the rural adjustment process. Each of the individual RAS components is considered below, measured against the possible adjustment problems and rationales for intervention canvassed in the previous chapter.

4.3 Interest rate subsidies and loans

Under the RAS, interest rate subsidies and loans are provided to farm businesses to invest in projects that are intended to increase farm productivity. In 1995–96, approvals were granted to 2 452 farm businesses (Table 4.2). This number of approvals was up 44 per cent from the number in 1993–94, the first full year for which data are available. About three-quarters of the applications for interest rate subsidies are approved.

Table 4.2: Applications, approvals and payments for interest rate subsidies,^a 1992–93 to 1995–96

		<i>Jan. to June</i>			
		<i>1992-93</i>	<i>1993-94</i>	<i>1994-95</i>	<i>1995-96</i>
No. of applications	No.	1331	3335	3108	3302
No. of approvals	No.	519	1707	2128	2452
Subsidy payments ^b	\$m.	14.1	16.6	28.2	27.6
Rural interest payments	\$m.	1499	1302	1509	n.a.

n.a. not available.

a Applications received may exceed total approvals plus total number of applications declined. This is because some States include approvals of pending applications from the previous year, while some States have applications pending at the end of the current year.

b Subsidy payments for 1992–93 were taken from RAS Operating Statement, subsequent subsidy payments were taken from RASAC statistical annex.

Sources: RASAC (1996), ABS (1996e).

One of the eligibility criteria is that farmers need to be able to obtain financial support from commercial lenders at normal interest rates (Crean 1993a). Other criteria take into account the necessity of support for the productivity enhancement proposals, past and expected future profitability, the capacity of the applicant to become financially independent, and the farm and non-farm assets and income needed for prudent risk management. Finally, there is a requirement for demonstrated technical, financial and business management skills of the applicant, which may be acquired with a grant for training and professional advice (see Section 4.4).

One key question is whether there are factors under government control that would otherwise inhibit banks from making loans to farmers to adopt investments which would lower costs or raise returns and therefore facilitate

productivity increases and long-term profitability. A second key question is whether the scheme's design ensures that its objectives are met in practice.

The rationale for interest subsidies on efficiency grounds does not appear to be strong. There is little evidence that farmers as a group have difficulty in gaining access to finance — Chapter 3 suggested there is scope for farmers to 'shop around' to obtain financial backing among banks which, in turn, have chosen demonstrably different customer risk profiles. Many risky or longer-term investments that would raise long-term profitability would also generate a high enough return to repay a loan at commercial rates, and therefore not require a subsidy. In these cases, the subsidy itself would not have any impact on efficiency. It would merely provide a windfall transfer to some two thousand five hundred farm enterprises receiving the subsidies.

There is also the question of whether the design of the scheme allows it to meet its objectives. One of the requirements for getting an interest subsidy is the provision of finance by commercial lenders at an interest rate that is competitive with that generally applicable to loans of the type being subsidised. However, unless financial institutions take into account the interest subsidy payments in assessing ability to repay loans, their loan approvals are likely to coincide with those made in the absence of the scheme.

Where farm enterprises have a pre-existing line of credit that they use for the project, this is likely to be the case. Lines of credit appear to be a significant form of bank lending to the agricultural sector. ABARE (1996a) indicates that in 1993 (the latest year for which data are available), 42 per cent of bank loans to the agricultural sector were in the form of overdrafts and 'other' advances, and 31 per cent were bank bills drawn (a short-term line of credit facility with the possibility of rollover), while only 27 per cent were term and farm development loans. A comparable breakdown is not available for non-bank finance, which accounts for 42 per cent of farm debt.

Where new funding is involved (ie a new loan or line of credit), however, the financial institutions are more likely to take account of the interest subsidy in approving the new funding. It appears to be common practice for farm enterprises to lodge their RAS interest subsidy applications and loan applications simultaneously. In these circumstances, more farm investment loans than otherwise are likely to be approved, some at the expense of loans to other projects that could meet repayments without a subsidy, and therefore generate a higher net return to the economy as a whole. To the extent that this occurs, the interest subsidy would have an adverse effect on efficiency.

It may be possible to prevent financial institutions from taking the prospect of interest subsidy payments into account if the loan approval is required *before* the interest subsidy approval. This is currently the case with interest subsidies provided under exceptional circumstances. However, even this requirement may not preclude prior negotiation between the financial institution and the prospective RAS applicant.

The RAS guidelines also require that a link be established between the productivity enhancing aspects of the eligible project, and sustainable long-term profitability of the farm business. From an economic perspective, such a link is desirable, since productivity improvements for their own sake may lead to 'gold plating', that is, taken beyond the point at which they generate an adequate return on investment. Indeed, from an economic perspective, the necessity to generate an adequate return on investment should be the paramount objective, with productivity improvements being but one (and not necessarily the best) means to achieve that end.

In the guidelines, the requirement for productivity improvement can be project-specific (see Box 4.2), while long-term profitability of necessity applies to the enterprise as a whole. The ideal resolution would be for the criteria to specify that the *incremental* contribution of the investment to overall long-term profitability needs to be identified. One of the eligibility criteria seems to come close (see Box 4.2), but the guidelines do not explicitly require an appropriately designed partial budget analysis.

In the face of such ambiguities, the States have considerable discretion in how they each choose to administer the scheme.

Given the stated objective of the RAS and the requirement for financial support from commercial lenders, it needs to be asked whether the interest subsidy component is having any positive impact on efficiency. But if there is judged to be a case, options for targeting the assistance more efficiently need to be explored, so that the subsidy is confined to marginal investments which would not proceed in the absence of the assistance. Consideration should be given to requiring the assistance to be repaid, since this mechanism can help to screen out unviable candidates. In other contexts, this design principle is reflected in the HECS scheme and other repayable grant schemes.

Box 4.2: Defining productivity enhancements

The RAS guidelines define the purpose of the interest subsidies and loans as increasing the productivity of the farm enterprise, which will lead to their improved sustainable long-term profitability, by:

- adopting sustainable farming systems; and/or
- adopting technological developments; and/or
- enhancing resource use (including capital, labour and land); and/or
- changing farm programs.

The RAS guidelines include, as one of the eligibility criteria, the extent to which the RAS support is likely to contribute to, or facilitate productivity increases for the farming enterprise through:

- a reduction in average farm operating costs; or
- a sustainable increase in the value of the farm enterprise's production which leads to increased profitability.

Source: Crean (1993a).

In the current context, the administration costs associated with governments tracking and recovering repayable grants may be problematic. However, the provision of finance to marginal investments and the tracking and recovery of repayments is precisely the function that financial institutions perform when they provide finance to higher risk applicants at a higher interest rate. Therefore, even in design terms, it is not clear how the interest subsidy scheme improves on the operation of the market.

4.4 Support for training and professional advice

RAS support is available to farmers to partially defray the costs of undertaking approved training and obtaining farm management advice. Either in isolation or as part of an integrated package, one approved purpose of the training and professional advice is to improve the productivity of the farm enterprise, leading to improved sustainable long-term profitability. The other approved purpose is to assist farmers without prospects in the farm sector to liquidate their farm assets in an orderly manner. In the first case, the training or advice needs to be appropriate to the individual farmer's needs. In both cases, the support must be necessary to enable the farmer to take the training or advice.

In 1995–96, 5 715 proposals for training and professional advice were approved, a 37 per cent increase on 1993–94 (Table 4.3). Around 93 per cent of applications were approved. Expenditure in 1995–96 was \$5 million, representing a 127 per cent increase on 1993–94 levels.

Table 4.3: Applications, approvals and payments for subsidies for training and professional advice,^a 1992–93 to 1995–96

		<i>Jan. to June</i> <i>1992-93</i>	<i>1993-94</i>	<i>1994-95</i>	<i>1995-96</i>
Training					
No. of applications	No.	742	3436	3246	4746
No. of approvals	No.	473	2667	2708	4566
Professional advice					
No. of applications	No.	1374	1435	1195	1402
No. of approvals	No.	790	1513	909	1149
Combined					
No. of applications	No.	2116	4871	4441	6148
No. of approvals	No.	1263	4180	3617	5715
Subsidy payments ^b	\$m.	0.2	2.2	3.8	5.0

For footnotes, see Table 4.2.

Source: RASAC (1996).

The objective of support for agricultural training and professional advice is similar to that for interest rate subsidies — to promote productivity. However, the relative use made of the two measures differs substantially between jurisdictions (Table 4.4). In Western Australia, a larger emphasis is placed on training and advice than in other States, with the number of grants for training and advice outweighing the number of interest subsidy grants by nearly thirty to one. At the other extreme, in Queensland, grants for training and advice are around 53 per cent of the number of interest subsidy approvals. Nevertheless, because of the relatively high value of individual interest subsidy payments, expenditure on these exceeds expenditure on training grants in all States (Table 4.4).

Table 4.4: Incidence of RAS productivity improvement measures by State, 1995–96

	<i>NSW</i>	<i>Vic.</i>	<i>Qld.</i>	<i>WA</i>	<i>SA</i>	<i>Tas.</i>	<i>NT</i>	<i>Total</i>
Approvals (No.)								
Interest subsidies	385	509	1091	99	238	119	11	2452
Training etc	1414	643	579	2814	70	148	47	5715
Expenditure (\$m)								
Interest subsidies	8.026	4.769	9.127	2.270	1.927	1.193	0.295	27.607
Training etc	2.529	0.694	0.473	0.726	0.422	0.126	0.027	4.997

Source: RASAC (1996).

There is a larger number of grants for training than grants for professional advice. This balance reflects a strong orientation in New South Wales and Western Australia to support training rather than professional advice. However, programs in Victoria, South Australia, and Tasmania are oriented to grants for professional advice.

The training grants are typically directed towards courses that do not attract other forms of government support. For example, grants for periodic (as opposed to short, one-off) TAFE courses would not normally be approved.³ In contrast, land management courses would be likely to be approved if they did not attract support through other channels. For this reason, the Property Management Planning program is excluded because it is funded separately. Skills audits would be likely to be approved for farmers expecting to leave the sector. Similarly, professional advice in preparing a farm management plan would likely be approved for farmers planning to stay.

As noted in the previous chapter, the efficiency argument for grants for training and advice is not clearcut. Individual farmers would normally have compelling incentives to obtain skills and information to allow them to run their farming enterprise in the most profitable way, or to maximise the chance of a successful transition out of farming. This raises the prospect that many of the grants are being paid to farmers who otherwise would have undertaken the course or sought the advice at their own expense. Where farmers are instead required by the RAS authorities to take training courses or seek professional advice as a way

³ It is unclear whether the short, one-off courses offered by TAFE colleges are run on a full cost-recovery basis or are implicitly subsidised by taxpayers.

of reducing the authorities' risks or own accountability, there would need to be a careful assessment of whether this was the most cost-effective or appropriate course of action.

If there is a more general efficiency argument for government support of such training, it could take one of two forms. First, some types of education and training may generate benefits that go beyond those that can be captured by the recipient. General primary and secondary education are often cited as examples. However, RAS support is not available for courses or sources of generally applicable 'advice' that may already be attracting government support. More importantly, the RAS-assisted training and advice needs to be 'appropriate' to an individual farmer or group of farmers, and an overriding principle of the RAS is that it be responsive to the 'specific circumstances pertaining to the applicant'. This raises the prospect that much of the training and advice is relatively narrow, with the benefits likely to be wholly captured by the individual farmer or farming group. There is, however, a broader issue of the rationale for government involvement in vocational training that goes beyond the agricultural sector.

A second possible reason for government support is that, although the benefits may be captured fully by the recipient, they will not materialise for some time. For example, lending institutions may be less inclined to lend for the accumulation of intangible 'human capital' than they are for physical investments. This argument has little force in situations where lending institutions have already approved a general line of credit for a farm enterprise (normally fully secured against farm collateral), and where the line of credit is not tied to a particular use. It may be more relevant for farmers seeking finance specifically to enable them to undertake further training.

If grants for training and professional advice are maintained, efficiency would be enhanced if the grants were provided only to marginal farmers, who could not obtain the training or advice without support, but who with the training or advice would be relatively sure of achieving sustainable long-term profitability. One program design mechanism that has been adopted already in several States requires farmers to fund a given proportion of the course costs themselves. This reduces outlays and potentially excludes those with no real future in farming. An alternative may be to require the farmer to repay at a later date some or all of the support for training and professional advice. The HECS scheme provides one such precedent. The efficiency of both alternatives would depend, in part, on the associated administration costs.

4.5 Re-establishment grants

Farm owners who elect to leave the industry because their farm enterprise is no longer viable are eligible for re-establishment grants of up to \$45 000. Payment of the grant is made at, or following, settlement of the sale of all productive farm assets.

To be eligible for the maximum grant, household assets (including cash and money held in banks, real estate, value of business or farm, and securities, but excluding household and personal effects) have to be no more than \$45 000. The value of the grant reduces according to a sliding scale, with farm households having net assets over \$90 000 being ineligible for any grant. In 1995–96, 250 re-establishment grants were approved (Table 4.5). Expenditure in that year was \$10.9 million, down substantially from the levels of the two previous years.

Table 4.5: Applications, approvals and payments for re-establishment grants,^a 1992–93 to 1995–96

		<i>Jan. to June</i>			
		<i>1992-93</i>	<i>1993-94</i>	<i>1994-95</i>	<i>1995-96</i>
No. of applications	No.	401	676	440	347
No. of approvals	No.	136	403	302	250
Grant payments ^b	\$m.	0.7	16.2	13.5	10.9

For notes see Table 4.2.

Source: RASAC (1996).

Re-establishment grants are intended to assist farmers who have decided to leave farming to do so 'in an orderly manner and to re-establish themselves post-farming' (Crean 1993b). The inference is that, in the absence of government support, there would be significant adjustment problems.

The discussion in Chapter 3 does not point to specific barriers to exit from the agricultural sector given the extent of departures from the sector. However, there may be a perception that the timing of exit is not appropriate (ie exit decisions are delayed too long). From an economic efficiency perspective, government support in these circumstances would be warranted if earlier exits resulted in net community benefits. Earlier exit may well leave exiting farmers in a better financial position. In turn, this could facilitate re-employment and

reduce their need for subsequent welfare support (eg unemployment benefits).⁴ However, given the size of the grants (up to \$45 000), net savings may be the exception rather than the rule.

Even if a case can be made to facilitate exit, it needs to be considered whether this is most effectively pursued by means of re-establishment grants. Do the grants hasten departure? If so, is the difference in timing significant?

In relation to the first question, some re-establishment grants may simply defer rather than expedite departures from the industry. This could be the case once a farm's assets drop to \$90 000 (the upper limit for grant payments) or less. Once assets fall below this threshold, the scheme effectively cushions farmers against further falls in asset values until such time as asset values fall below \$45 000. In this range, farmers are compensated for any fall in asset values by a higher grant. This is a consequence of the sliding scale of grant payments applied to farmers having assets of between \$45 000 and \$90 000. It provides an incentive for farmers to continue operations in the hope that they can reverse their economic situation. To the extent that financiers may take account of this scenario and be more prepared to provide credits to such farmers, adjustment could be further delayed.

Even if it is considered that, in most instances, the availability of re-establishment grants does not slow adjustment, it needs to be asked whether they bring exit forward to a significant extent. The thresholds applied are low relative to the average assets of most farm households. Thus, by the time they are eligible for a grant, the average farmer has already seen his/her assets eroded very significantly. For many farmers reaching this situation, exit may well be imminent, irrespective of the availability of the grants.

In summary, it is not clear that re-establishment grants are warranted on efficiency grounds. If instead they are maintained on welfare grounds, consideration should still be given to minimising any adverse impacts on the pace of adjustment. As a minimum, the present system of sliding payments should be eliminated or modified to prevent them frustrating the objective of the grants.

⁴ To the extent that earlier exits reduce bankruptcies and foreclosure actions by financial institutions, it would also reduce personal trauma.

4.6 Land trading

Land trading grants facilitate the transfer of farm units to a new owner. They can also be used to retire land that no longer supports agriculture. The grants may be paid directly to the farm enterprise or used by State RAS authorities to acquire the land, which is then on-sold. This form of support has had very limited application (Table 4.6) and has only been used by Victoria and Western Australia (RASAC 1996).

The key issue is whether such a minor scheme materially adds to the re-establishment grants provision, and whether the costs of administration of this special element outweigh any economic or welfare benefits.

Table 4.6: Applications, approvals and payments for land trading grants,^a 1992–93 to 1995–96

		<i>Jan. to June</i>			
		<i>1992-93</i>	<i>1993-94</i>	<i>1994-95</i>	<i>1995-96</i>
No. of applications	No.	12	16	6	7
No. of approvals	No.	4	9	5	3
Subsidy payments ^b	\$m.	0.2	np	0.4	0.2

np not published.

For footnotes, see Table 4.2.

Source: RASAC (1996).

4.7 Exceptional circumstance and related programs

Exceptional circumstances may be announced by government in times of unexpected or severe downturns in an agricultural commodity market or unusually unfavourable weather conditions. Over the life of RAS 1992, exceptional circumstance support has been provided for heavy rains in South Australia, a wool market recession, and drought in New South Wales and Queensland.

In 1995–96, 4 852 enterprises received exceptional circumstance support (mainly drought relief), with total expenditure amounting to \$90 million (Table 4.7). Total RAS payments in 1995–96 were 50 per cent above the levels two years earlier, reflecting the continuing severe effects of drought in New South Wales and Queensland. In the two most recent years, this form of

support has been supplemented by additional special Drought Relief Payments of \$82 million and \$130 million, respectively.

Table 4.7: Exceptional Circumstance and Drought Relief Payments,^a 1992–93 to 1995–96

		<i>Jan. to June</i>			
		<i>'1992-93</i>	<i>1993-94</i>	<i>1994-95</i>	<i>1995-96</i>
No of approvals					
Heavy rain in South Australia	No.	655	1527	..	..
Drought in NSW and Queensland ^c	No.	1765	2027	4722	4852
Wool assistance	No.	339	2029	169	..
Total		2759	5583	4891	4852
Subsidy payments^b					
Heavy rain in South Australia	\$m.	4.7	14.9	..	..
Drought in NSW and Queensland ^c	\$m.	..	18.9	81.9	89.7
Wool assistance	\$m.	1.6	25.2	4.9	..
Total		6.2	59.0	86.9	89.7
Drought Relief Payments		..	..	82	130

na Not available.

For footnotes, a and b see Table 4.2

c In 1995–96, drought assistance was also approved for Victoria, South Australia and Tasmania. However, NSW and Queensland accounted for 96 per cent of the number of approvals and subsidy payments.

Sources: RASAC (1996), DPIE (1995,1996c).

To date, exceptional circumstance support has been the largest single RAS outlay. It is also an outlay over which governments have little or no control once eligibility conditions are met. The eligibility criteria have been made more detailed, explicit and stringent in the case of drought support than in other exceptional circumstances. The criteria are discussed in more detail below.

Defining exceptional circumstances

A key question is whether there is a sensible definition of an exceptional circumstance that would warrant government involvement on efficiency grounds.

A key characteristic of the agricultural sector is that it operates as a matter of course under conditions of considerable price and production uncertainty. Market prices and weather conditions (combined with the biological nature of agricultural production) are two of the key sources of variability which farmers face. The uncertainty is reflected in substantial year-to-year variations around long-term trends (Chapter 2).

While farmers might prefer a more stable environment, this alone does not establish a case for intervention. Furthermore, farmers have open to them a range of options in terms of insurance, diversification and other strategies (eg forward selling options) serving to reduce the impact of uncertainty. If farmers' risk management options are curtailed there could possibly be a case for intervention on efficiency grounds, but the most efficient intervention is more likely to involve addressing the impediment directly rather than providing income support.

The obvious danger with income support is that it could undermine the incentives of farmers to adopt their own risk management strategies. In some circumstances, however, events are likely to conspire sufficiently against the farmers to warrant income support on welfare grounds. The key question then becomes whether it is possible to define an exceptional circumstance in a way that minimises any adverse effect on efficiency, in particular on farmer incentives to make provisions for risk.

One consideration is whether there should be pre-announced rules for determining exceptional circumstances at all, or whether they should be determined at the time on a case-by-case basis. The exceptional circumstances drought support is an example of the former, while the support given for a wool market recession and heavy rains are of the latter type.

It is a matter of judgment as to which approach is likely to have a less adverse impact on efficiency. In either case, the more generous the provision is expected to be, the more adverse the likely effect on efficiency. One consideration, therefore, is whether one of the approaches is likely to be better insulated from the inevitable pressure to make the provisions more generous. A rules-based approach arguably may be less susceptible to such pressures. In addition, a rules-based approach may reduce one source of policy-based uncertainty for farmers.

A second consideration is how the rules are defined. In the past, exceptional circumstances have generally been defined in terms of what causes them. For example, exceptional circumstances have been defined as a drought of a particular severity and duration (as with the current drought provisions) or a fall

in market prices of a particular severity and duration (as in past underwriting schemes).⁵ The question is how broadly or narrowly the contingencies should be defined. With exceptional circumstances defined according to a particular cause or contingency, the support is likely to blunt farmer incentives to make adequate provision for the contingency in question. This argues for a relatively narrow definition. But some types of rule may be more susceptible to pressure for proliferation. If exceptional circumstances are defined as a particularly severe downturn in wool prices, will this invite calls for exceptional circumstances in the face of downturns in the prices of wheat or avocados? If exceptional circumstances are defined as particularly severe droughts, will this invite calls for support in the face of flood or storm damage? It is likely that the market-based definitions are more susceptible to proliferation.

As noted, these are issues requiring considerable judgment. Against this background, however, it is useful to look at the experience under the exceptional circumstance drought provisions, the area where detailed policy guidelines exist already.

Exceptional circumstances — drought

In 1989, drought was removed from the schedule of possible disasters subject to National Disaster Relief. Simultaneously certain severe drought conditions were included as exceptional circumstances for the purpose of providing RAS support to eligible farm enterprises. Exceptional circumstance drought support is provided according to pre-announced guidelines.

The guidelines for exceptional drought circumstances support appear to be more stringent than normal RAS provisions, apparently in recognition of the potential danger that such support could undermine the self-reliance of the farmer. For example, under the NSW exceptional drought circumstance guidelines, which are typical of those for other States, the eligibility criteria for interest subsidies are more stringent than those for general interest subsidies in the following respects:

- the exceptional circumstance needs to be identified as the factor adversely affecting the farmer's income (this also ensures the assistance is not automatically available to all farms in an exceptional circumstance area);

⁵ Exceptional circumstances could instead be defined in terms of their effects (eg any event which drove farmer incomes below a given threshold for a particular period of time), but this would risk also providing support for those with no prospect of long-term viability in farming.

- approval needs to be sought every 12 months (normal interest subsidies are available for up to 3 years, although the total amount of interest subsidy payable for all categories of RAS support is limited to \$100 000 per applicant in any 12 month period, or a cumulative total of \$300 000 over the previous 5 years);
- one criterion by which the recipient's long-term sustainability is judged is that he or she must be subject to a program of productivity improvements or skill enhancements under the normal provisions of RAS, and/or the farm must have operated without RAS support in at least two of the past five years (this provision does not appear in the guidelines for general assistance); and
- there is a specific requirement that the financial institution approve the loan *before* the payment of support for exceptional circumstances (this provision also does not appear in the guidelines for general RAS assistance).

Exceptional circumstances support is also available in the form of additional re-establishment grants. In NSW, in addition to re-establishment support of up to \$45 000 under the general provisions of RAS, a grant of \$30 000 is available to those seeking to re-establish from areas subject to an exceptional drought circumstance. This additional assistance may be effective in speeding up a decision to leave the industry, relative to the effects of the normal RAS re-establishment grants. However, it is not clear whether the decision would be made earlier than it would in the absence of any re-establishment assistance.

A drought exceptional circumstance is defined to be a drought outside of those which could be expected to be managed under normal farm business risk management strategies (RASAC 1996). The event is subject to the following meteorological threshold test — it must be a one in 20–25 year event, and be a greater than 12 month event severe enough to be likely to cause substantial loss of income over two consecutive years. It is then subject to other core criteria relating to agronomic and livestock conditions, water supplies, environmental impacts, farm incomes levels and the scale of the event.

The definition is therefore firmly based on a particular contingency, with the claim that it precludes contingencies that would be handled under normal farm business risk management strategies. However, it is not clear why a once in a 20–25 year drought should be any less subject to risk management strategies than less severe or more frequent droughts. There is always some probability of an infrequent but severe drought occurring in any given shorter time period.

The entire notion of *risk* management is concerned with recognising and managing such probabilities.

When the IAC (1986) inquired into the use of crop and rainfall insurance as a risk management strategy, it found that

... in Australia, crop and rainfall insurance do not play a major role in farmers' risk management. At present, only a little crop insurance and as far as the Commission is aware, no rainfall insurance is available. (IAC 1986, p. vii)

One reason given for the lack of demand for crop and rainfall insurance was the availability of government backstop support to the industry in time of difficulty. From the insurance supply side, it was found that

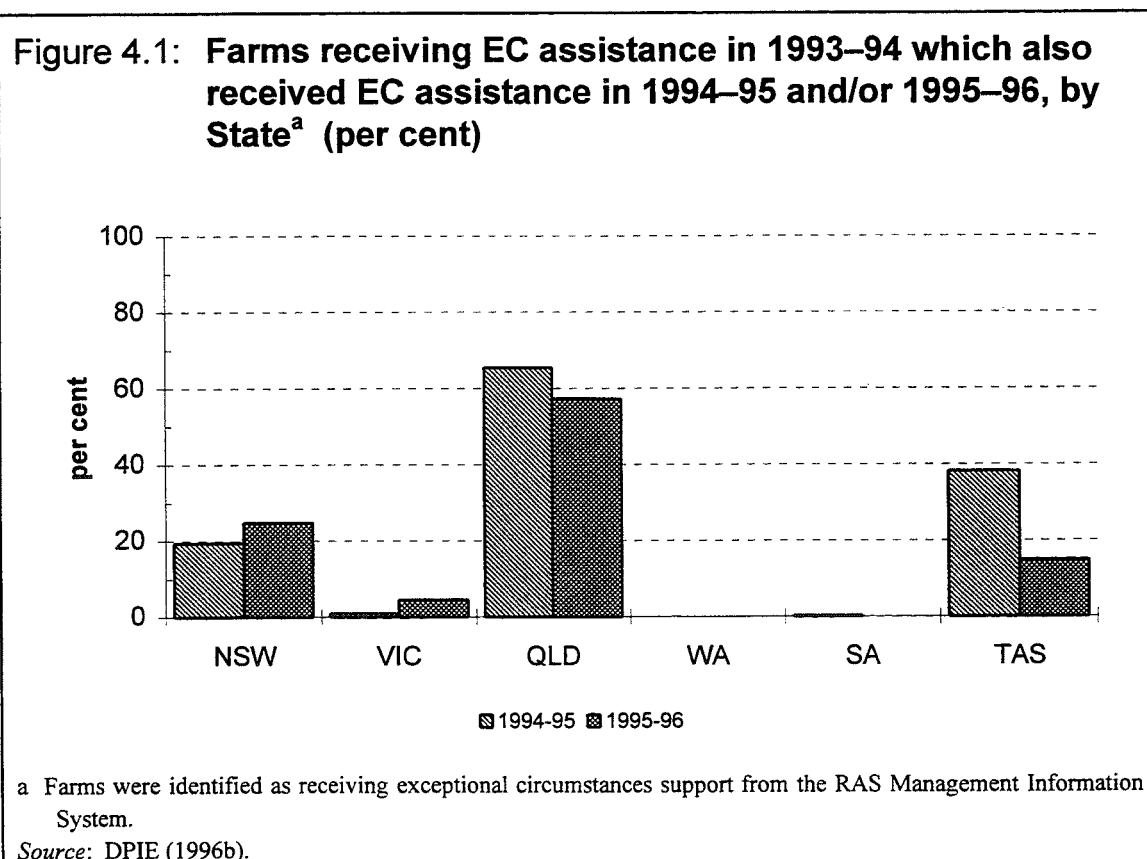
... the information necessary for setting premium rates was usually not available, or very expensive to obtain. The potential for farmers to influence loss levels through management decisions (moral hazard) and a tendency for insurance schemes to attract farmers with high risk (adverse selection) would also raise costs. In addition, administrative costs were also expected to be high. Moreover, major risks in Australian agriculture, such as drought often affect many farmers at one time, thus reducing the ability of insurers to spread risk. Therefore insurers must seek to obtain reinsurance cover which according to participants, if available is expensive. (IAC 1986, p. vii)

Circumstances change. Mayers (1995) indicates that while there is still limited take-up of insurance for drought and agricultural industry catastrophes, there is emerging evidence of successful schemes. In addition, reinsurers are increasingly acknowledging that drought insurance may be handled by structures similar to those used in the field of catastrophe risk management (eg risks associated with typhoons, oil rig disasters and earthquakes). Drought and other catastrophe insurance may be difficult to develop. However, the technology to devise successful schemes is increasingly becoming available and underwriting profits are achievable. Mayers suggests that there is probably no basis for assuming regulatory failure, since companies are free to enter and leave individual insurance markets.

In view of the IAC's earlier findings, an issue for review is whether government assistance for exceptional circumstances is acting as an impediment to the design and marketing of successful schemes — lowering the incentives of insurers to commit to the relevant research and development and lowering the incentives of farmers to approach their insurers for cover. There is a need to consider the extent to which some or all of the risk born by the government through exceptional circumstances support can be transferred to private insurance using currently available insurance methods, and the potential advantages for farmers and the community of such a transfer.

One indicator of the impact of the RAS on farm self-reliance is the incidence of farms receiving support under RAS (including through exceptional circumstances) in successive years. This has been examined using data from the RAS Management Information System.

A significant portion of farms receiving exceptional circumstance support does so for more than one year (Figure 4.1). In some cases this may be because a particular exceptional circumstance lasts for more than a year. In Queensland, for example, around 60 per cent of farmers who received exceptional circumstance support in 1993–94 also received similar support in 1994–95 and/or 1995–96.



In some cases, however, the extended duration of support may be because one type of exceptional circumstance replaces another. In NSW, for example, there was a change in emphasis from the wool decline to drought between the years 1993–94 to 1994–95. Around 20 per cent of farmers in NSW receiving exceptional circumstance support in 1993–94 also received support in at least one of the two following years. While it is not possible to tell directly, at least

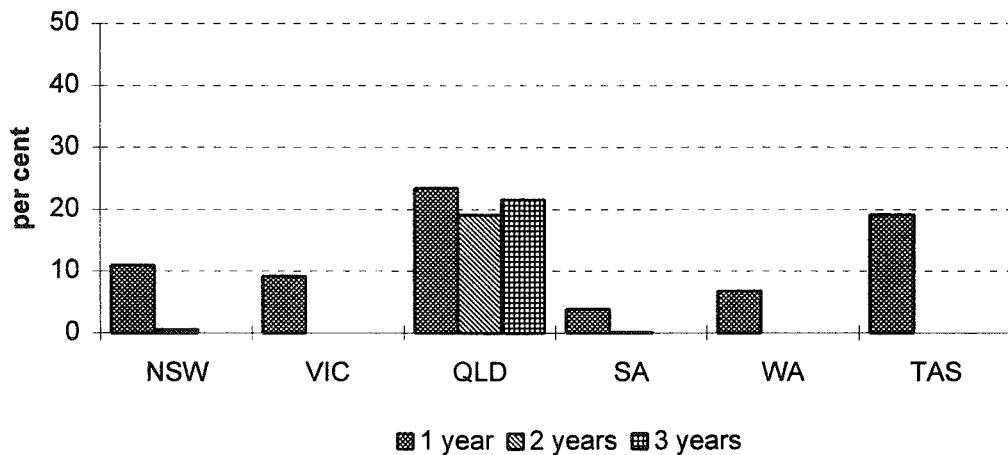
some of those recipients may have claimed under more than one exceptional circumstance.

Some farms that received EC assistance in 1993–94 also received other types of RAS support in subsequent years, with the types and timing of this support differing between States. In some situations, this may have been encouraged by the exceptional circumstances guidelines themselves. For example, in Western Australia 37 per cent of farmers that received exceptional circumstances support in 1993–94 also received support for training and professional advice in one of the years between 1993–94 and 1995–96, while 21 per cent did so for two of those years (Figure 4.2).



In other cases, the transfer from exceptional circumstance to other forms of RAS support (predominantly general interest subsidy payments) is not encouraged by the guidelines, but occurs nevertheless. The most striking example is in Queensland, where 22 per cent of farms receiving exceptional circumstance support in 1993–94 also received general interest rate subsidies for a full three years between 1993–94 and 1995–96 (Figure 4.3).

Figure 4.3: Number of years of interest rate subsidy assistance received by 1993–94 EC recipients, by State (per cent)



Source: DPIE (1996b).

Virtually no farms receiving exceptional circumstance support in 1993–94 received support through RAS re-establishment grants or support through land trading. This is consistent with the intention that farms receive exceptional circumstance support when they are likely to be viable outside of ‘exceptional’ conditions. An issue for review is whether it is merely other forms of government support that is ensuring that viability.

The significant proportion of EC recipients receiving other types of support over an extended period also raises the question of whether the move to a contingency-based definition of exceptional circumstances has been an effective strategy for limiting the generosity of the assistance. The experience under RAS 92 contrasts with that under RAS 89, where carry-on assistance was generally available, but was used relatively infrequently (Drought Policy Review Taskforce 1990). While this may have been simply because the general assistance was only available once a farmer was declared uncreditworthy, the experience with EC support suggests that both the rationale, and the form of the assistance are issues which need to be revisited.

4.8 Conclusion

Examining the individual elements of RAS suggests that they may not be improving substantially the efficiency of adjustment, although they provide

financial advantages to recipient farm enterprises and farmers. Because of the advantages available to individual farmers, there is a risk that resources are being channelled into supported activities that could be better spent elsewhere. The analysis also indicates that, according to plausible interpretations of the various provisions of the scheme, RAS could act to impair, rather than encourage, adjustment.

Analysis of ABARE farm survey data suggests that, on balance, overall adjustment and related assistance is impeding rather than facilitating adjustment in the size and ownership of farms.

PART 2 APPENDICES

APPENDIX A:

COMMONWEALTH AND STATE GOVERNMENT SUPPORT FOR AGRICULTURE

A.1 Introduction

The Commonwealth and State governments provide specific industry assistance in the form of budgetary support to industry (such as subsidies and other government payments), product marketing arrangements, and border assistance (such as tariffs and quotas). This appendix reports on assistance to the agricultural sector, placing that support in the context of assistance to other sectors. The appendix complements information on agricultural industry assistance reported in Chapter 2 of this submission.

Section A.2 reports Commonwealth and State assistance to agricultural and other industries. Sections A.3 looks at the forms of Commonwealth assistance to agriculture while Section A.4 provides details of Commonwealth and State budgetary assistance to agriculture. Assistance to agriculture is then broken down by type of activity in Section A.5, while Section A.6 sums up agricultural assistance in Australia.

A.2 Commonwealth and State assistance to industry

The agricultural sector is a substantial recipient of support from Commonwealth and State government programs (Table A.1). The Commission has estimated that this sector receives at least 13 per cent (\$1.3 billion in 1994–95) of Commonwealth Government support to industry, primarily through agricultural marketing arrangements and budgetary outlays. Agriculture also receives at least 32 per cent (\$0.7 billion in 1994–95) of State government budgetary outlays on assistance to industry, primarily in the form of research and development, extension services and budgetary outlays directed at lowering the costs of agricultural inputs. Across both levels of government, 16 per cent of budgetary assistance is directed at agriculture, amounting to \$1.9 billion in 1994–95.

In addition, agricultural establishments would have benefited by around \$117 million in 1993–94 from payroll tax exemptions and rebates. This is a

broad estimate of the payroll tax revenue forgone through both specific and general exemptions. However, this estimate of revenue forgone is likely to overstate, perhaps significantly, the level of assistance afforded by the general payroll tax exemption, because it includes the value of exemptions afforded to large enterprises or enterprise groups whose marginal employment decisions are made at the top marginal rate (IC forthcoming).

Table A.1: Commonwealth and State government assistance to industry (\$ million)

	<i>Agriculture</i>	<i>Mining</i>	<i>Manufacturing</i>	<i>Services</i>	<i>Total</i>
Commonwealth (1994-95)	1260	116	7956	536	9868
State budgetary (1994-95)	678	87	784	578	2127
Sub-total	1938	203	8740	1114	11995
State payroll tax (1993-94) ^a	117	76	563	2447	3203
Total	2055	279	9303	3561	15198

a Revenue forgone through payroll tax exemptions and thresholds.

Source: IC (forthcoming, 1996b).

A.3 Forms of Commonwealth assistance to agriculture

Commonwealth assistance to agriculture is provided through the budget (outlays and revenue forgone), market interventions such as statutory marketing arrangements, and border measures. The principal forms of support to agriculture come from the remaining industry marketing arrangements and budgetary outlays (Table A.2). The main agricultural industries to benefit from marketing arrangements are dairy, with around 90 per cent of the total (\$493 million in 1994-95) and sugar with 6 per cent of the total.

The negative assistance afforded by border measures shows that the cost impost imposed by tariffs on materials and capital equipment outweighs the benefit of any tariffs on agricultural output. Commonwealth assistance through taxation revenue forgone comes from the various agricultural sector-specific concessional taxation deductions and arrangements (such as Section 75, Income Tax Assessment Act, and income averaging).

Table A.2: Commonwealth assistance to agriculture by principal form, 1994–95

<i>Border assistance^a</i>	<i>Marketing arrangements</i>	<i>Budgetary outlays</i>	<i>Taxation revenue forgone</i>	<i>Total</i>
-129	553	598	170	1192

a Tariff assistance on agricultural outputs net of tariffs on imported material and capital equipment used in agriculture.

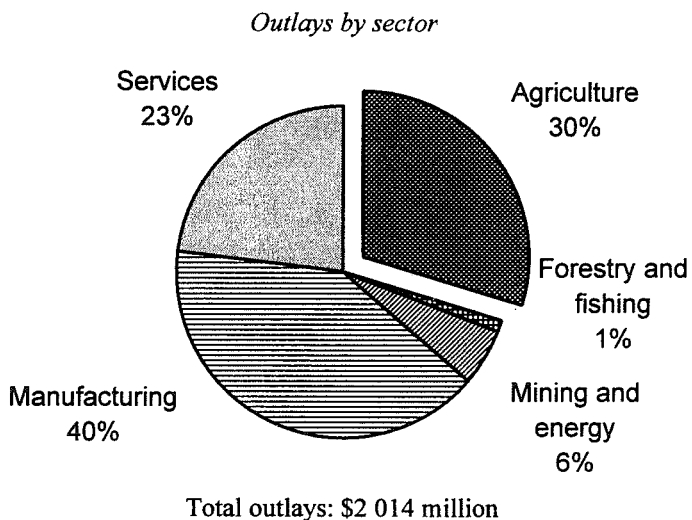
Source: IC (1996b).

A.4 Components of budgetary assistance

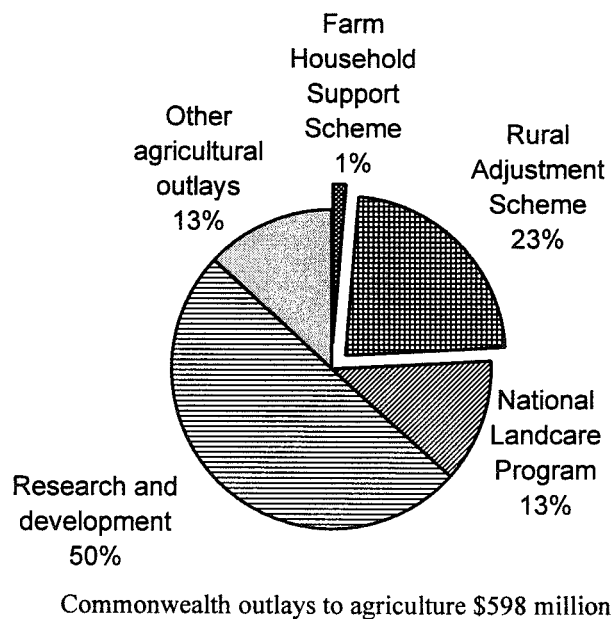
Commonwealth budgetary outlays

Budgetary outlays provide the main source of Commonwealth Government support for agriculture. Moreover, the agricultural sector received about 30 per cent of Commonwealth budgetary outlays to industry in 1994–95 (ie around \$598 million) (see Figure A.1). Of the total budgetary support for agriculture, about 23 per cent was allocated through RAS. About half of the remaining expenditure was allocated to rural R&D (\$299 million) which is managed mainly through grants awarded to rural R&D corporations and direct funding to the Commonwealth Scientific and Industrial Research Organisation (CSIRO). A further 13 per cent was provided through the National Landcare Program.

Figure A.1: Commonwealth budgetary outlays to industry, 1994–95

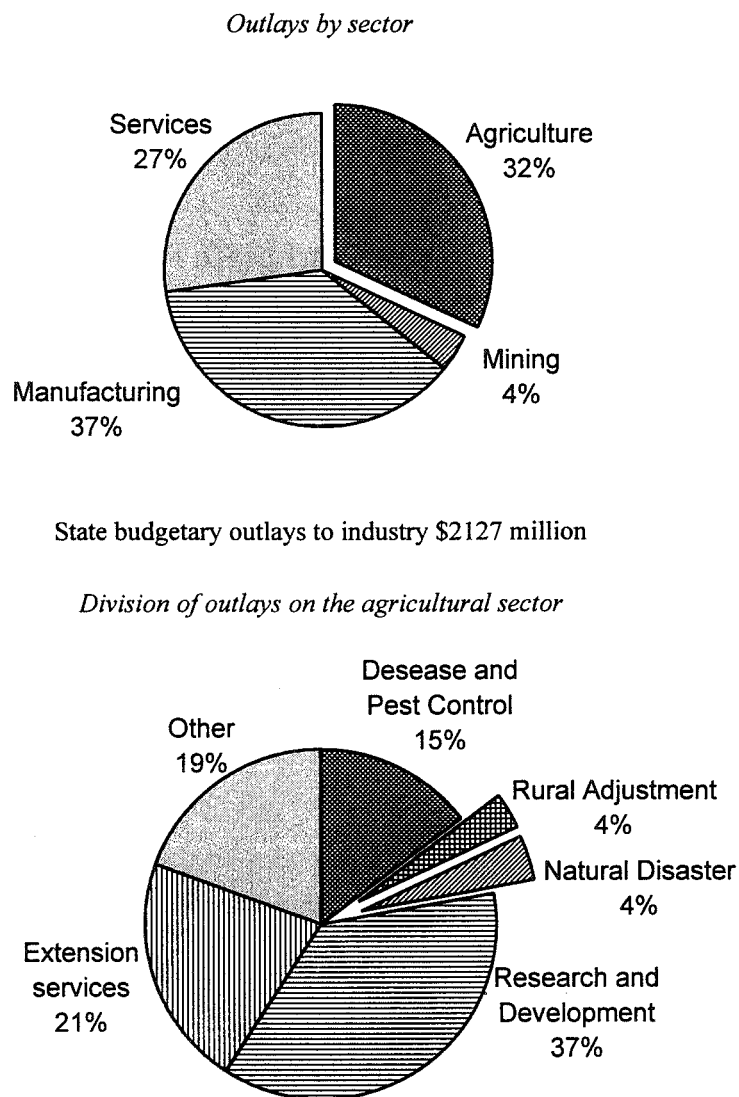


Division of outlays on the agricultural sector



Source: IC (1996b).

Figure A.2: State government budgetary outlays to industry, 1994–95



Source: IC (forthcoming).

State budgetary outlays

State support for agriculture accounted for around 32 per cent of total State government outlays to industry in 1994–95 (Figure A.2). Only 4 per cent of State budget expenditure for agriculture was allocated to rural adjustment, reflecting the role of the Commonwealth as the main source of such funding. A further 4 per cent of State budget expenditure on agriculture was allocated to

national disaster relief work. On the other hand, more than half of State budgetary support for agriculture was directed at field activities such as disease and pest control and extension services. As with Commonwealth expenditure on the agricultural sector, research and development was the single most important category of State expenditure, accounting for around 37 per cent of State budgetary spending on agriculture (Figure A.2).

Components of Commonwealth and State RAS expenditures

While the cost of the RAS to the community includes the cost of administering and monitoring the scheme, the support afforded to the farming community is determined by the amount that is paid out to the agricultural businesses and households. In 1995–96, the total value of RAS payments to businesses and households amounted to \$148 million, of which \$123 million was contributed by the Commonwealth with the remaining \$25 million being contributed by the States (Table A.3).

Over half of all adjustment support was allocated to support under the exceptional circumstances interest subsidy provision of the RAS. Enhanced re-establishment grants provided under the guidelines for drought exceptional circumstances are also available, but account for a small fraction of total EC expenditure.

Of the remaining support, some 19 per cent (or \$28 million) in 1995–96 was paid out as interest rate subsidies to farm businesses under the general provisions of the RAS. This amount was additional to the interest subsidies of around \$13 million (or 9 per cent of RAS spending) paid out under residual commitments pertaining to the 1988 RAS.¹ The total interest subsidies therefore amounted to around \$41 million (ie 27 per cent of RAS expenditures). This outlay delivered substantial support to the individual businesses in receipt of the payments and, in aggregate, constituted about 3 per cent of the total interest bill of the agricultural sector (around \$1509 million) (ABS 1996e).

¹ According to information on RAS payments provided by the NSW Rural Adjustment Authority (1996), RAS 1988 payments are mostly of interest rate subsidies to farm businesses under Part A of RAS 1988. NSW rural adjustment information contributes about half of the national total reported. The NSW information has been used in this submission to indicate the likely composition of the national total.

Table A.3: Composition of Commonwealth, State and Territory RAS 1992 expenditures,^a 1995–96

	<i>Commonwealth</i>	<i>States & territories</i>	<i>Total</i>	
	\$m	\$m	\$m	Per cent
<i>Normal RAS</i>				
Interest rate subsidies and loans	24.8	2.8	27.6	18.6
Skills enhancement	4.5	0.5	5.0	3.4
Re-establishment grant	9.8	1.1	10.9	7.4
Land trading	0.2	0.0	0.2	0.1
<i>Exceptional circumstances</i>				
Drought	69.4	20.3	89.7	60.5
Enhanced re-establishment grant	1.5	0.2	1.7	1.1
<i>RAS 1988</i>	13.1	0.0	13.1	8.8
Total support to rural businesses and households	123.3	25.0	148.2	100.0
<i>Management of Scheme</i>				
Administration	12.7	1.4	14.1	
Diagnostics	0.4	0.1	0.5	
Total RAS expenditure	136.4	26.5	162.8	

a Due to data source differences, there are fractional differences between the value of total industry support from RAS reported in this table and the values implicit in Figures A.1 and A.2.

Source: RASAC (1996).

Re-establishment grants, which accounted for 7 per cent (or \$11 million) of RAS payments to the agricultural sector in 1995–96 provide support to farm households leaving the land once it becomes clear that their prospects as farm operators are limited and their net assets have been substantially eroded. The land trading grants also provide support to farmers to leave the industry. The payments under this provision only provide a fractional component of total RAS support to agriculture (0.1 per cent or \$153 000 in 1995–96).

A.5 Assistance to agriculture by type of activity

The Commission has analysed agricultural activities benefiting from Commonwealth budgetary assistance, rural adjustment support and marketing arrangements to estimate effective assistance to the agricultural sector. These estimates show how the assistance measures alter the returns to value adding factors (including labour, capital and land) in an industry.

The analysis provided in Chapter 2 details effective assistance to agriculture by component. In 1994–95, average effective assistance to agriculture was estimated to be around 11 per cent of value added. This assistance was divided unevenly between agricultural activities, with the intensive livestock activity receiving the most assistance because of the dairy industry marketing arrangements (Table A.4). The industry group receiving least assistance during the 1990s was extensive cropping.

Table A.4: Average effective rates of assistance by agricultural activity and standard deviations for the agricultural sector, 1990–91 to 1994–95

<i>Activity/commodity description</i>	<i>1990–91</i>	<i>1991–92</i>	<i>1992–93</i>	<i>1993–94</i>	<i>1994–95</i>
Horticulture	7	7	8	6	4
Extensive cropping	8	3	4	4	4
Extensive irrigation and high rainfall crops	10	7	4	7	9
Extensive grazing	14	8	8	7	5
Intensive livestock	42	45	31	44	52
Total agriculture	15	11	10	11	11
Standard deviation^a	(22)	(24)	(25)	(56)	(61)

a The standard deviation in percentage points measures how far from the average items in a frequency distribution are located, thereby measuring the extent of variation or dispersion in the distribution. The larger the variability amongst individual activities' nominal and effective rates, the larger the standard deviation.

Source: IC (1996b).

In 1990–91, the agricultural sector received more assistance than in previous years, due largely to the Commonwealth Government's recovery package for the wool industry. The termination of this support for wool was the most significant factor in the decline in assistance between 1990–91 and 1991–92. This decline was partially offset by increases in a number of other forms of

assistance, in particular, an increase in payments provided under Parts A and B of the RAS from \$49 million to \$124 million as a result of continued downturn in the agricultural sector.

A.6 Summing up

The agricultural sector receives substantial support from both Commonwealth and State governments. The support is provided in many forms, with the level of benefit differing substantially between activities in the agricultural sector. After a reduction in the level of sector support in 1990–91, agricultural industry assistance has remained fairly constant over the 1990s.

The statistical information presented in this appendix provides a useful guide to the incentives provided for resources to flow from the rest of the community to the agricultural sector, or vice versa. However, the information does not provide an explicit analysis of the effects of that support on the agricultural sector or on the rest of the community. It also does not elaborate links that may exist between individual assistance programs and the full package of assistance to the agricultural sector. To obtain insights into these matters requires further analysis of the nature of the schemes and intersectoral linkages.

APPENDIX B: THE CHARACTERISTICS OF FARMS BUYING AND SELLING LAND

B.1 Introduction

Chapter 4 reports a regression analysis of broadacre agriculture and dairy farms designed to consider the effects of RAS and related forms of government support on the likelihood of farm adjustment occurring through land trading. That analysis complemented the information in Chapter 3 on the incidence of farm businesses selling all or part of their holding (Statistical Annex, available on request).

This appendix outlines the methods used by the Commission to undertake the analysis. The regression analysis estimates the influence changing government assistance and other farm characteristics on the likelihood of farmers: purchasing land; selling land; both purchasing and selling land; or neither purchasing nor selling land (relative to all other categories). A logit model is used in the analysis (see Annex for details of the model structure).

Section B.2 provides an outline of the estimating framework and the information used in the study. That section is supported by a technical annex to the appendix. Section B.3 reports the results from the study and Section B.4 sums up the findings of the analysis.

B.2 Model framework and information on farm characteristics

General framework

This analysis uses cross-section data from the Australian Bureau of Agriculture and Resource Economics (ABARE) Farm Surveys of broadacre agriculture and dairy farms averaged across the years 1991–92 to 1994–95, to examine the effect of various farm characteristics on land trading activity. The ABARE surveys themselves provide farm level information on:

- financial transactions of the farm unit;
- production activities;

- demographic profiles of the farm owner/manager and families; and
- physical attributes of farm.

For the purposes of this analysis, ABARE provided data that had been averaged or otherwise aggregated across farms. The resulting data were still broken down by 7 State or Territory (excluding the ACT) regional categories, by 3 farm size categories, and by 4 land transaction types. These groups provided the units of observation for the cross-section analysis, so there were $7 \times 3 \times 4 = 84$ observations for each regression.

Four regressions were undertaken, one for each transaction group. The dependent variable in each regression was a binary variable, constructed to take the value 1 for those observations (ie farms in each State and size category) falling into the relevant transaction group (eg buying land) and 0 for each of the observations in the other three transaction groups.

Table B.1 contains definitions of the farm characteristics used as explanatory variables in each of these regressions. A broad range of variables, covering all aspects of the farming enterprise, is available from the farm survey. As explained above, these characteristics were averaged (or otherwise aggregated, as shown in Table B.1) across farms. The explanatory variables measure characteristics and actions pertaining to the particular years included in the analysis, and therefore do not take into account any lagged effects on land trading status of changes in farm characteristics.

Table B.1: Definitions of ABARE Farm Survey farm characteristics as included in the analytical data

<i>Characteristics</i>	<i>Code</i>	<i>Definitions</i>
Family and operator labour	FOL	The average imputed value per farm of the operator's estimate of the labour input of the operator, partners and their families.
Government assistance received	GAR	The average government assistance paid to each farm business and integrated household unit. Includes all forms of assistance to the farm business and welfare payments supporting the household in farming, but excluding generally available assistance to individuals and RAS re-establishment grants.
Total cash receipts	TCR	The average total farm cash receipts including sale of farm products, agistment, royalties and other revenue from farm operations.
Total farm business debt	TFBD	The average of farmers' estimates of farm business debt.
Total non-farm income	TNI	Income for operator and spouse from wages, other businesses, investment and social welfare payments.
Total capital	TC	The average total gross value of the farms' capital items — the assets of the farm are treated as wholly owned by the proprietors.
Value of land purchased	VLPPH	The average value of land per hectare purchased by those farms in the purchasing transaction groups.
Value of land sold	VLSPH	The average value of land per hectare purchased by those farms in the sold transaction group.
Cooperator/ manager less than 40 yrs	CML40	Proportion of farms in a category with an operator/manager aged less than 40 years.
Cooperator/ manager more than 60 yrs	CMM60	Proportion of farms in a category with an operator/manager aged more than 60 years.
Transaction group		Four categories of transaction activities undertaken by farms: (1) Purchased land (2) Sold land (3) Neither bought nor sold land (4) Both bought and sold land
Size group		Dummy variable for size group of farms: (1) Total cash receipts less than \$100 000 (2) Total cash receipts between \$100 000 and \$200 000 (3) Total cash receipts more than \$200 000

Source: ABARE (1993).

The preferred equation for each transaction category was established by progressively eliminating statistically non-significant variables (at the 5 per cent level of significance) from a general specification. The estimated coefficients have then been used to calculate elasticities at sample means. The elasticities show the percentage change in the likelihood of the particular transaction in

question, in response to a one per cent change in the farm characteristic (eg government assistance received). It is these elasticities that are reported in the results table below and in Chapter 4.

Relationship of measured government assistance to RAS and related welfare payments

In principle, the regression analysis should include RAS assistance by individual RAS category. If this information were available, it may have been possible to estimate the separate effects of each category of RAS expenditure on the likelihood of farms engaging in land transactions.

In practice, information about government payments to farmers is only available in a composite item. However, the dominant forms of assistance in this aggregate are RAS and RAS related payments (Table B.2). Drought-related interest subsidies account for more than half of the assistance paid. In addition, measured assistance also includes fodder, water and freight subsidies, which are normally paid in times of drought or other exceptional circumstance and hence are likely to be highly correlated with RAS payments. A further category of 'other' drought assistance payments, not separately identified within the ABARE survey, is also included. This category includes drought relief family support payments such as Job Search Allowance, Family Payments, and Austudy. Total drought-related measures comprise 75 per cent of the composite assistance measure.

Non-drought related receipts are grouped together in the survey, and again, cannot be further disaggregated. This group includes non-RAS items of apprentice subsidies, CES rebates, and youth employment scheme payments. It also includes RAS payments such as general interest rate subsidies and support for training and professional advice. The inclusion of these RAS payments in this category means that the non-drought, non-RAS items comprise less than 25.2 per cent of the total assistance measure (and ABARE's assessment is that they probably comprise a great deal less).

Table B.2: Components of measured government assistance, 1994–95 (per cent)

<i>Assistance type</i>	<i>Share</i>
Drought related measures:	
Interest subsidy	54.5
Fodder subsidy	2.3
Water subsidy	0.5
Freight subsidy	13.4
Other drought subsidies	4.1
Non-drought related receipts	25.2
Total	100.0

Source: ABARE (1996b).

The measure of government assistance used in the regression analysis is therefore dominated by RAS and RAS-like payments paid to farmers who stay on the land. It does not include re-establishment grants, the key component of RAS designed to assist non-viable farmers to leave the land. For this reason, the regression analysis should not be expected to find that government support (as measured) increases the probability of land sales. The question is whether it facilitates land purchases, or whether it is associated with trading inaction.

B.3 Results

Table B.3 details the results of the four regressions. The figures reported are elasticities at sample means, with t-statistics in brackets. As mentioned above, the technique used was general-to-specific and so both the initial and preferred estimates are shown. All of the coefficients of the preferred specifications were significant at the 5 per cent level.¹

The key finding, in the context of this review, is that as government support increases, the likelihood of buying land decreases, while the likelihood of neither buying nor selling increases (Table 4.1). If government assistance increases by one per cent, the likelihood of farmers buying land (as opposed to doing anything else) is estimated to fall by 0.45 per cent (row 2, column 3).

¹ That is, there is a 5 per cent chance of rejecting the null hypothesis when it is true.

Table B.3: Responsiveness of farm trading status to changing farm characteristics^a

<i>Explanatory variables</i>	<i>Probability of buying land</i>		<i>Probability of selling land</i>		<i>Probability of buying and selling land</i>		<i>Probability of neither buying nor selling land</i>	
	<i>Full specif^a</i>	<i>Final specif^a</i>	<i>Full specif^a</i>	<i>Final specif^a</i>	<i>Full specif^a</i>	<i>Final specif^a</i>	<i>Full specif^a</i>	<i>Final specif^a</i>
FOL	5.37 (3.188)	5.46 (3.506)	-0.53 (-0.350)	..	-0.81 (-0.296)	..	-1.79 (-2.796)	-1.20 (-2.787)
GAR	-0.40 (-1.800)	-0.45 (-2.068)	-0.34 (-1.091)	..	-0.08 (-0.350)	..	0.23 (2.300)	0.21 (2.840)
TCR	-3.23 (-2.795)	-2.92 (-2.872)	2.66 (2.399)	2.34 (3.080)	1.61 (1.230)	..	-0.39 (-0.956)	..
TFBD	1.41 (2.638)	1.41 (2.847)	1.87 (2.719)	1.62 (2.892)	-0.63 (-0.476)	..	-0.86 (-3.199)	-0.48 (-2.957)
TNI	1.21 (2.128)	0.97 (1.848)	-0.21 (-0.441)	..	-1.13 (-0.879)	..	-0.22 (-1.414)	..
TC	2.58 (2.269)	2.64 (2.491)	-5.24 (-3.376)	-4.71 (-3.805)	-0.50 (-0.298)	..	0.84 (1.975)	..
VLPPH	0.34 (3.817)	0.32 (4.204)	..	..	0.45 (1.941)	0.35 (2.064)	..	..
VLSPH	..	..	0.05 (1.330)	..	0.09 (0.398)	..	..	..
CML40	-0.27 (-0.826)	..	-0.72 (-1.996)	-0.83 (-2.606)	0.85 (1.325)	0.77 (2.181)	0.14 (1.046)	..
CMM60	-0.16 (-0.337)	..	0.37 (0.713)	..	0.67 (0.981)	..	0.42 (2.460)	0.39 (2.606)
First size group dummy	0.68 (1.883)	0.41 (1.956)	-0.23 (-0.816)	0.87 (2.143)	..	..	0.00 (0.004)	..
Second size group dummy	0.67 (0.887)	..	0.05 (0.929)	..	..	..	0.15 (0.655)	..
Summary statistics								
Correct predictions(%) ^b	88.5	86.3	88.5	87.8	93.1	90.8	79.9	76.3
Log likelihood ratio	62.4	61.0	32.8	26.8	21.3	17.1	69.5	62.8
Critical values	19.7	15.5	19.7	9.5	18.3	6.0	18.3	9.5

Figures in parentheses are t-statistics.

a These results were tested by using a Probit model, and as expected, no significant changes were noted.

b The number of correct predictions of the observed land transaction as a percentage of total observations.

Source: Industry Commission estimates.

If receipt of government assistance increases by one per cent, the likelihood of farmers neither buying nor selling land (as opposed to making some kind of transaction) is estimated to increase by 0.21 per cent (row 2, column 9). As expected, the size of measured assistance has no significant impact on the likelihood of selling land. It also has no significant impact on the likelihood of both buying and selling land.

A number of other factors appear to have an influence on land trading patterns. The likelihood of land purchase is estimated to increase by 0.97 per cent for each one per cent increase in non-farm income (row 5, column 3). Diversification in sources of income can facilitate expansion, and hence adjustment. The likelihood of purchase, either alone or in conjunction with land sale, is also estimated to increase with the value of the land being purchased. A one per cent increase in the value of the purchased land is estimated to increase the likelihood of purchase by 0.32 per cent (row 7, column 3) and increase the likelihood of both purchase and sale of land by 0.35 per cent (row 7, column 7). This is likely to reflect that land expansions occur to acquire better quality land.

Some factors appear to have a greater influence on land trading patterns than does government assistance. These include cash receipts, indebtedness, and capitalisation of holdings. Business indebtedness is significant for farms buying land, and for those selling. However, the possible interpretation differs. In the case of land purchases, a one per cent increase in indebtedness (measured at the end of the financial year) apparently increases the likelihood of farmers having brought land at sometime during the year by 1.41 per cent (row 4, column 3). In practice, the causation is likely to be the other way around — the link between higher debt and land acquisitions may simply reflect the use of borrowings to finance land purchases. This alternative interpretation is supported by evidence from ABARE (1996a) showing that in all agricultural activities, the predominant use of loans is for land purchases. However, indebtedness is also positively related to sales, with the probability of selling increasing by 1.62 per cent for each percentage increase in debt level (row 4, column 5). In this case, the regression analysis may be capturing more accurately the likely causation — for some farms with higher debt levels, land sales may be a means of managing/reducing indebtedness.

Total capitalisation is also likely to be measuring reverse causation. The results show that the purchase of land during the survey period is associated higher capital value (row 6, column 3) as measured at the end of the period, while the opposite is true for the sale of land. As for indebtedness, the causation is likely to be the other way around — a land purchase raises the value of assets while

the sale of land lowers the value of assets. In the case of the explanatory variable, cash receipts, the nature or direction of causation is not clear. One possible reason for low cash receipts increasing the likelihood of land purchases (row 3, column 3) is that farmers with lower farm income purchase land with the intention of increasing farm income at some future time.

Labour supply and demographic factors are also significant for some categories of adjustment. For instance, a one per cent greater use of family labour is estimated to increase the likelihood of land purchases by 5.46 per cent (row 1, column 3) and decrease the likelihood of taking no action by 1.2 per cent (row 1, column 9). In the case of farmer age, the likely incidence of farmers neither buying nor selling land increases with the proportion of operator/managers being over 60 years of age (row 10, column 9). In addition, an increase in the proportion of farmers under 40 years of age reduces the likelihood of farmers only selling land but increases the likelihood of them both buying and selling land (row 9).

B.4 Summing up

This regression analysis describes the effects of farm characteristics on the farmer's involvement (or otherwise) in land transactions. It is the binary nature of the dependent variable in this analysis that makes the choice of a probabilistic model an appropriate one. A logit model was chosen, and when the results were tested for sensitivity to model specification, a probit model was found to produce almost identical outcomes.

Overall, the analysis suggests that adjustment is occurring primarily for reasons that are not directly related to the provision of government support. While it has not been possible to isolate the effects of the components of RAS individually, the study indicates that for farms actively engaged in adjustment through changes in land ownership, government assistance is either not significant, or is negatively related to farm adjustment expansion. At the same time, the incidence of government support is positively related to trading inaction.

Technical annex: Details of methodology

Four separate regressions, each with a binary dependent variable identifying the incidence of one of the transaction categories, were run to estimate the effects of the various farm characteristics on the probability of the farm performing the observed transaction. For example, to estimate the effects of farm characteristics on the probability of a farm purchasing land, the dependent binary variable takes the value 1 if the farm did purchase land and 0 otherwise. There are a number of estimation methods that can be used in the case of such dichotomous dependent variables. The current analysis uses a logit model for these estimations.

The logit model assumes a regression model

$$y_i^* = \beta_0 + \sum_{j=1}^k \beta_j X_{ij} + u_i \quad (1)$$

where X_{ij} is a vector of explanatory variables for the unobserved variable y_i^* of which we only observe a dichotomous behaviour such that

$$y_i = \begin{cases} 1 & \text{if } y_i^* > 0 \\ 0 & \text{otherwise} \end{cases} \quad (2)$$

In the present analysis, the underlying variable y_i^* could be defined as the propensity or ability to engage in land transactions. The explanatory variables in equation (1), then, should include items which explain both propensity and ability.

From equations (1) and (2),

$$\begin{aligned} P_i &= \text{Prob}(y_i = 1) = \text{Prob}\left[u_i > \left(\beta_0 + \sum_{j=1}^k \beta_j X_{ij}\right)\right] \\ &= 1 - F\left[-\left(\beta_0 + \sum_{j=1}^k \beta_j X_{ij}\right)\right] \end{aligned} \quad (3)$$

where P_i is the probability of the particular land transaction being carried out and where F is the cumulative distribution function of u_i .

If the distribution of u_i is symmetric then

$$P_i = F \left[\beta_0 + \sum_{j=1}^k \beta_j X_{ij} \right] \quad (4)$$

For the logit models the cumulative distribution of u_i is assumed to be logistic, in which case

$$F(Y_i) = \frac{\exp(Y_i)}{1 + \exp(Y_i)} \quad (5)$$

where $Y_i = \beta_0 + \sum_{j=1}^k \beta_j X_{ij}$

Therefore,

$$\log \frac{F(Y_i)}{1 - F(Y_i)} = Y_i$$

For the logit model,

$$L_i = \ln \left[\frac{P_i}{(1 - P_i)} \right] = \beta_0 + \sum_{j=1}^k \beta_j X_{ij} \quad (6)$$

L_i (the log-odds ratio) is now a linear function of the explanatory variables.

The model estimated for the current analysis was:

$$L_i = \beta_1 + \beta_2 \text{FOL} + \beta_3 \text{GAR} + \beta_4 \text{TCR} + \beta_5 \text{TFBD} + \beta_6 \text{TNI} + \beta_7 \text{TC} + \\ \beta_8 \text{VLPPH} + \beta_9 \text{VLSPH} + \beta_{10} \text{CML40} + \beta_{11} \text{CMM60} + \beta_{12} \text{SD1} + \beta_{13} \text{SD2}$$

where SD1 and SD2 are binary variables representing the medium and large farm size-groups, respectively.

Some care needs to be taken in the interpretation of the coefficients estimated for this model as they represent marginal effects of a change in the explanatory variables on the log-odds ratio and not the marginal effects on the probability (P_i) of the particular event occurring. The following expression for the marginal effects on P_i can be derived by transformation and total differentiation of equation (6):

$$\frac{\partial P_i}{\partial X_i} = \beta_i P_i (1 - P_i)$$

This expression demonstrates that these effects are determined by both the value of the coefficient and by the level of probability at which the change is measured. The results reported during this analysis are elasticities measured at the mean of the observations, where the elasticity of the probability P_i with respect to the characteristic X_i is equal to:

$$\frac{X_i}{P_i} * \frac{\partial P_i}{\partial X_i}$$

The preferred models were estimated using a general-to-specific estimation technique based on the calculated t-statistics. The log likelihood ratio statistic and Maddala's count R^2 were also used as additional discriminatory statistics.²

To test the sensitivity of the results to the adoption of alternative techniques, estimates were also obtained using the probit and linear probability models, which differ from the logit model in the distribution of the error term u_i . As expected the differences between the models, especially logit and probit models, were not significant and this comparison confirmed the qualitative results of the analysis, with the same significant and equally signed coefficients.

² See Maddala (1992).

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