



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search
<http://ageconsearch.umn.edu>
aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

10 June, 2006

A Century of Agricultural Progress in Australia

David Godden*

**43rd Annual Conference, Australian Agricultural and Resource Economics Society
Christchurch, New Zealand
20-22 January 1999**

© Copyright D. Godden 1999

* Department of Agricultural Economics, University of Sydney. This paper is dedicated to the memory of Bruce Davidson. I am grateful to my teachers and colleagues, too numerous to mention individually, from whom I have learned much in the last three decades about Australian agriculture and its economics.

A.1 Introduction¹

The approach adopted in this paper is to examine the development of Australian agriculture during the twentieth century in the context of its relationships with the rest of the Australian economy. The broad outline of this approach is similar to that adopted in Godden (1997, Figure 1) and is summarised in Table A.1.1. The key relationships of farm production – viewed via production, technology, input prices, structure and agricultural services – are with natural resource processes (climate, land, water), marketing systems, trade, market conditions, physical and social infrastructure, and inter-sectoral linkages. The more metaphysical role of agriculture, including its political context, is viewed through selected social and political “visions” of key opinion makers.

Using these themes, two approaches are possible. One approach would be to follow each theme through the century. An alternative approach – adopted in this paper to emphasise the contemporaneous interactions of the themes in generating the evolution of agriculture – is to view the inter-relationships among the themes within time-slices of the century. The four “slices” used in this analysis are: 1900-1930 (Peace, War and Peace); 1930-1950 (Depression, War and Recovery); 1950-1970 (Good Times Plateau); and 1970-1999 (On the Slippery Slope). In this second approach, each theme can be followed through the time slices.

Fin de siècle—I

Imagine presenting a pageant of a “Century of Progress” in Australian agriculture since 1900. While the audience’s interest is focused on the spectacle, the pageant depends on the staging. In the opening scene, the stage’s framework comprised, firstly, the polity of the just-completed Federation of the six colonies into an independent nation (minus New Zealand, which had declined the opportunity of joining the federation). The second part of the stage comprised the environmental conditions – an interaction of climate regimes and soil types – which had created a diverse set of opportunities for agriculture (i.e. cropping, grazing, horticulture) across the continent. The stage’s third section comprised the somewhat diverse mixture of peoples – visibly, mostly European – unevenly dispersed across the continent. The ever-changing backdrop against which the pageant was played out comprised the variability of the climatic regimes, the development of the national and international economies, and the relationships of Australia – both direct agricultural relationships, and broader national relationships – with the rest of the world.

National setting

Some elements of the pre-Federation colonial history of the Australian continent were significant for post-Federation development. For example, the effect of the colonial structure and inter-colonial rivalries is illustrated dramatically by Davidson’s (1981, Figure 10-1) map of railway development in south-east Australia. Rail lines in the four south-eastern mainland colonies/states radiated out from the major cities that became their capitals, reflecting the colonial rivalries that dominated cooperation which might have been economically efficient in a land of capital scarcity relative to the magnitude of social infrastructure demands. The differences in gauges among the four colonies simply magnified the inefficiencies.

¹ The economist, in reviewing a century in economic progress, is blessed with rich primary and secondary source material in both agriculture and related industries and social activities. The twentieth century divides in about 1950 for applied economic analysis. The Keynesian macroeconomic revolution of the 1930s stimulated the development of national accounts data. Australia’s good economic data, including good data about agriculture, dates from about 1950. After 1950, the challenge is to organise the voluminous data into a coherent story. Prior to 1950, aggregate economic data has been reconstructed by economic historians and economists (e.g. Butlin 1962a, Davidson 1981 and Powell 1974) whose material is used extensively in this paper.

The Australian colonies federated to form the Australian nation by an Act of the British Parliament which came into force on 1 January 1901.² The Constitution articulated the broad framework by which Australia was subsequently governed. Coper (1992) argued that the economic (policy) framework of the Constitution could be divided into:

- . automatic no-go areas for the States, where the national interest took absolute priority – especially excises and bounties (ss.90-91)³ and limitations on inter-State trade (s.92); but also including coining money (s.115), discrimination against out-of-State nationals (s.117), as well as some activities which came to have major but incidental economic significance such as maintaining defence forces (s.114). However, within these areas the Commonwealth did not have unfettered power since it, too, was bound by s.92⁴ and could not directly discriminate between States by virtue of s.99, although incidental discrimination was possible especially via the grants power (s.96);
- . potential no-go areas for the States – articulated in s.51 – where the Commonwealth could, if it so wished, assert the priority of national interest and exclude the States by virtue of s.109; and
- . ss.106,107: “the remaining, unspecified subject-matters representing, at least in theory, the areas of local concern that were judged to be no business of the nation” (Coper 1992, pp.132-3) but constrained by the *Engineers* case of 1920 which exploded the doctrine of reserved State powers (Coper 1987, pp.179-90,185,187-90,194-201)

Both the facts of this division of powers and, at least as importantly, the closer definition of the scope of these powers and subsequent evolution of their interpretation, were of major significance for agriculture as for all sectors of the economy. For example, the potential form of State-based agricultural marketing schemes was constrained by States’ exclusion from levying excises and granting bounties which would have greatly simplified the operation of State-based marketing schemes. Both State- and Commonwealth-based marketing schemes were also subject to varying interpretations of the “free trade” obligation (e.g. Coper 1992, pp.135-142).

But the potential impact of the Constitution and its evolution went much wider through the potential Commonwealth heads of power in s.51. The quarantine provision directly affected agriculture by providing the Commonwealth with the right to legislate nationally. The Commonwealth’s power to regulate inter-state and international commerce was crucial because of the potential importance of inter-state and international trade in agricultural commodities for which statutory marketing schemes were subsequently developed. The Commonwealth’s corporations power provided opportunities to regulate commerce. And, of course, the taxation power – especially once the Commonwealth had squeezed the States out of raising income tax (Coper 1987, pp.214-6) – provided a major carrot and/or stick to assist the Commonwealth to induce desired behaviour from the States. The indirect power obtained through taxation was somewhat of a sleeper until Menzies relied on the use of s.96 grants to expand States’ education services (Coper 1987, p.213), and this power was extensively expanded by the Whitlam Labor Government in the 1970s (Coper 1987, pp.)

The other “sleeper” in the Constitution, until extensively utilised by the Whitlam Labor Government in the 1970s, was the “external affairs” power in section 51(xxix) under which the Commonwealth government could “import” foreign treaties into domestic law, even with respect to

² Probably the best – and too infrequently recounted – story of the connection between agriculture and Australia’s constitutional heritage is Symons’ (1982, pp.57-9) account of the 1867 Melbourne banquet for a visiting English prince.

³ Including the ultimate striking down of State franchise fees as quasi excises in the 1990s.

⁴ The Privy Council’s 1936 decision in *James v. the Commonwealth* prevented the Commonwealth from regulating interstate trade (Rural Reconstruction Commission 1946, p.246).

subject matter from which the Commonwealth was supposedly excluded (e.g. matters not covered in s.51).⁵

Indigenous Australians were a notable absence from the Constitution – except to the extent that the Commonwealth was not permitted to legislate on their behalf in the States and that they were not to be reckoned in population counts.⁶ Davidson (1981, ch.2) gave a harsh but realistic account of their exclusion – once their role in guiding exploration was complete and pastures and water discovered, indigenous Australians had no further economic services to render.⁷ Coper (1987, pp.50-2) noted that the English common law “took instant root in Australian soil” from the moment Governor Phillip claimed sovereignty for the Crown because NSW was a “settled” colony – i.e. a peaceful settlement “of previously unoccupied or practically unoccupied territory” – as declared by the Privy Council in 1889. Coper presciently argued that “the most fruitful path, despite the adverse decision in the *Gove* case [*Milirrpum v. Nabalco*], lay in a careful re-examination of whether there was a case for common law recognition of indigenous rights on peaceful settlement” (cf. the High Court’s *Mabo* and *Wik* judgements, §A.5).⁸

Environment

(a) resources

The driving force of environmental conditions was rainfall, whose key dimensions were its seasonality, the relationship between mean rainfall and evapo-transpiration, and the variability, periodicity and intensity of rainfall. Seasonality graded from summer-dominant monsoon in the north to winter-dominant “Mediterranean” climates of the south. Mean annual rainfall varied from 1,000-2,000mm p.a. along the north and east coasts of the continent, together with the continent’s south-east tip and the western part of Tasmania, with a small area on Tasmania’s west coast exceeding 2,000mm p.a. (Davidson 1981, pp.7-11). A narrow band following the continent’s eastern highland averages 800-1000mm p.a., with similar rainfall in narrow bands in the south-west of the continent and across northern Australia, and in central Tasmania. A broad arc from the Kimberleys in the north-west, through the Northern Territory and down through central Queensland and New South Wales and into Victoria and into the far south of South Australia receives 400-800 mm p.a. The arid and semi-arid interior receives under 400 mm p.a. (cf. Davidson 1981, Figure 1-8). The ratio of rainfall to evapo-transpiration gave rise to short growing seasons over much of the continent (Davidson 1981, pp.7-11). Inter-year rainfall variability was high – for example coefficients of variation for annual mean rainfall in Australia’s cropping areas are approximately 25-30 per cent except in some parts of the Western Australian wheat belt where it is somewhat lower (Rural Reconstruction Commission 1944c, Figure 3). In recent decades, what had previously appeared to European settlers as random rainfall variability became recognised as 7-10 year periodicity associated with the El Niño Southern Oscillation phenomenon. Additionally, there appears to be – in eastern Australia at least – longer run periodicity (cf. Figure A.1.1).

⁵ Sufficiently controversial by the 1990s for the Commonwealth and States to form a ministerial council to oversight future Commonwealth ratification of new treaties.

⁶ Until the referendum of 1967.

⁷ Reynolds (1998, p.51): “They [Aborigines] were not always hostile at the time of initial incursions [by Europeans] and often guided overlanding parties across their country and showed them where to find grass and water. ‘The natives’ [observed the Chief Protector of Aborigines at Port Phillip from 1849-59] were the parties who first guided the white men ‘through the intricacies of the forest’ and led them to their runs, their springs and rich pastures.”

⁸ Agricultural economists would not have been surprised at the High Court’s 1996 *Wik* decision regarding native title on pastoral leasehold. Davidson (1981, pp.249-50, emphasis added) had noted that:

In the Pastoral Zone the failure of the state to establish small grazing farmers in the eighteen-nineties had resulted in the state *owning* most of the land and renting it to occupiers on the long-term basis.

Similarly, Campbell and Dumsday (1990, p.163, 164) noted that “Australia is probably unique among Western countries in that a high proportion of its land is still in public ownership” although they also indicated that perpetual leasehold was “virtually indistinguishable from alienated land”. Once, however, the High Court decided in *Mabo* No. 2 (on 3 June 1992) that the Crown had never “owned” land but only held “radical title”, the Court’s subsequent decision in *Wik* would not have astonished agricultural economists at least.

Geographical features modify the continental pattern – for example, the lack of significant mountains reduces potential precipitation over much of the interior, although low mountains both on the east coast and in Tasmania provide limited alpine conditions (without permanent snow). Tasmania, as a higher-latitude island, has a climate much closer to that of Britain, which led to its being the first major wheat-producing state in Australia. Intensity of rainfall can be high (especially relative to mean rainfall) in most areas.

Much of Australia comprises ancient landforms, heavily weathered and giving rise to soils of generally low fertility. Many of the soils or subsoils were ancient ocean beds and contain high levels of soluble salts. Higher fertility soils were confined to alluvial flats, and rainforest, brigalow lands and grasslands with soils of high (but vulnerable) organic matter content (Davidson 1981, pp.26-27), and some highly fertile, basalt-derived soils (particularly in north-western New South Wales and southern Queensland). By the early twentieth century, much of the original flora had been cleared (in the case of timber – e.g. Davidson 1981, pp.259-260) or damaged by introduced livestock or rabbits in the cases of herbs and grasses (e.g. Moore 1962; Barr and Cary 1992, ch.1).

The combination of environmental conditions and economically-available enterprises (partly conditioned by transport; cf. Davidson 1981, Figure 10-1) gave rise to a general pattern of agriculture in the early twentieth century summarised in Figure A.1.2 (reproduced from Davidson 1981, Figure 12-1). Agriculture was generally characterised – except in the pastoral zones dominated by state-owned leasehold land – by owner-occupied farms with flexibility generally provided by share-farming rather than tenant farming (except in Victoria at the turn of the century; Davidson 1981, p.249). The character of agriculture was largely conditioned by transport costs which were high until the formation of good roads and especially rail (e.g. in NSW in the 1860s cf. Davidson 1990a, Tables 2 and 3 respectively). Thus high-value low-perishability wool was the dominant export from much of inland Australia. Exceptions occurred where distances to ports were short (e.g. in the agricultural areas of South Australia or coastal NSW) and bulky commodities such as grain could bear high haulage rates. Before railways, wheat for Sydney consumers was cheaper from South Australia than from interior NSW (Davidson 1990a, p.169). The structural consequence was that, at the turn of the century, pastoral production was commercial whereas, especially in NSW, small-holder agriculture (“selectors”) were transforming from subsistence to commercial farmers (Davidson 1990a, p.175).

The conclusions of the first major investigation of irrigation in Australia were not enthusiastic:

“We believe that too sanguine views of its [irrigation’s] profitability are often entertained from an under-estimate of the cost and an over-estimate of the results ...” (quoted in Davidson 1969, p.52)⁹

Despite this inauspicious beginning, irrigation developed rapidly in Victoria with 120,000 acres under irrigation trusts by 1895 (Davidson 1969, Table 15; see also Powell 1976, ch.10; Barr and Cary 1992, ch.10).¹⁰ Alarmed at the insolvency of the Chaffey’s irrigation company and the impossibility of collecting interest on or obtaining capital repayments from the irrigation trusts, the Victorian Government established a Royal Commission into the trusts in the 1890s. This enquiry concluded that:

... most works should never have been started and would not have been if, when they were submitted to the Department of Water Supply, they had been looked at in a common-sense way. (Davidson 1969, p.56)

⁹ The myth of the ability of irrigation to “drought proof” farming was exploded on economic grounds by the Rural Reconstruction Commission (1944c, para.306).

¹⁰ The nineteenth century schemes had relatively small-scale storages (cf. Davidson 1969, Table 16).

There was also limited development of irrigation in South Australia which collapsed along with the Chaffey's company in 1893 (Davidson 1969, pp.59-60).

(b) resource degradation

Europeans started dramatically altering the Australian landscape almost from the outset. Sydney's rapid desecration of its water supplies is a well-known story (Bolton 1992, p.73f; Powell 1976, p.18); less well-known is the rapid degradation of the surrounding area. The clearing of the Hawkesbury around Richmond-Windsor rapidly denuded the river banks of trees, even though evidence of extreme flooding had initially deterred Governor Phillip from settling the area. Within a year of occupation, a ship's captain had expressed concern about trees felled into the river for disposal (Rosen 1998, p.2; Powell 1976, pp.19-20). In 1803, an order of Governor King forbade "the felling of timber on the banks of the Hawkesbury and its tributaries" (Rosen 1998, p.4; see also Bolton 1992, p.37). By the late 1840s, complaints were reported of pollution from noxious industries in the Hawkesbury, and dredging was recommended to restore navigability (Rosen 1998, p.6). Previously-reported river-bank erosion was accelerated in major floods of the late 1860s and early 1870s:

"All of a sudden, the bank on one side began to move, with a roar like the sound of artillery; there was a narrow opening through which about two acres of land kept sailing out, and this came bodily out of the opening of about 50 yards, at a depth of about 40 feet; and we could see the trees gradually disappearing ... the occurrence occupied about twenty-five minutes." (quoted in Rosen 1998, p.8)¹¹

The siltation of the Hawkesbury appears to have been rapidly accelerated by the building of the railway line over the Blue Mountains in the 1850s-1870s (Rosen 1998, p.7).

The mining of the soil was quickly adopted as the obvious exploitation practice (cf. Drynan 1986, p.152; Rural Reconstruction Commission 1944c, para.337):

... the land becomes choked and covered up with vetches, and other rubbish, so that no crop can come to perfection; the plan then adopted is to let this lie fallow ... to be overgrown with mimosas, and to become a nursery for rank and noxious weeds of every description; in the mean time, the Settler clears another piece of fresh land, and with this proceeds as before.

(Atkinson (1826) quoted in Rosen (1998, p.5))^{12,13,14}

Bolton (1992, p.56) noted Commissioner Bigge as reporting that the "productive powers of the soil, that is not generally a fertile one, have been exhausted by repeated cropping." Pasture lands suffered a similar fate (e.g. Powell 1976, pp.31-2).¹⁵ Later in the nineteenth century, Australian

¹¹ "One farm of 40 acres purchased before the flood cycle [of 1870] was eventually sold as a 12 acre farm. Opposite Windsor the river bank fell in for a quarter of a mile ... By 1876 ... the bridge [at Richmond] had to be extended 60 feet and the river bed rose six feet because of siltation." (Rosen 1998, p.8)

¹² "The wheat-grower ... has nothing before him but to go on ... from one farm to another while new land is to be obtained. No professor who ever sat in a chair can persuade him out of that simple truth" (Meinig 1962 reporting an 1875 commission in South Australia, quoted in Reeve 1988, p.22).

¹³ The objective of many nineteenth century "settlers" to make money fast and return to England (Bolton 1992, p.57) effectively substantially increased the discount rate when it came to the exploitation of Australian resources.

¹⁴ "In Atkinson's opinion, many of the finest tracts on the river were ruined and although the class of proprietor was changing, the problems lingered and many were irremediable. He also makes it clear that in 1823-24 the river banks had been undermined and were collapsing into the stream. Sand deposition was occurring and clearing practices continued to affect the river regime via increased run-off and changes to the river channel. He believed flooding was exacerbated by a vastly increased number of obstructions on the river bed." (Rosen 1998, p.5)

¹⁵ For example, after settlement of the NSW Western Division from 1860, sheep numbers rose rapidly to peak at 13.5 million head in the 1890s. Under the combined weight of drought and rabbits from the late 1890s, numbers collapsed to 5-8 million (averaging 6.3 million) up to the late 1950s (Butlin 1962b, Table 1). Moore (1962) described the physical

wheat yields had “decreased from 0.86 tonnes/hectare in the 1860s to 0.49 tonnes/hectare in the 1890s” (Donald (1964) referenced in Reeve (1988, p.19)).¹⁶ At least in a small area of the New England, massive soil erosion and change in species composition appears to have accompanied the introduction of European livestock around 1840 (Gale et al 1995).

Rapacious exploitation occurred elsewhere.¹⁷ The goldrushes of the 1860s led to extensive clearing of local areas for fuelwood, and massive streambed damage from alluvial and later hydraulic mining (Bolton 1992, p.69ff; Powell 1976, pp.37-9; Reeve 1988, pp.15-7). There was ringbarking on an enormous scale from the 1860s (Bolton 1992, p.42). Weeds were generally inadvertently introduced, although prickly pear was deliberately imported. Animals were generally deliberately introduced – e.g. rabbits, foxes, goats, horses, pigs, camels, water buffalo (which imported cattle tick), sparrows – many of which became serious feral pests (Bolton 1992, p.85ff; Reeve 1988, pp.28-31).¹⁸ Extension of grazing into semi-arid areas – even without the devastating rabbit introduction – was observed to be a mining exercise. Bolton (1992, p.85) quoted a station inspector for Dalgety’s on the exploitation of pastoral resources such as saltbush:

... but they forgot in doing this that they were eating the haystack, and there was no crop growing to build another. Then the rabbits came along.¹⁹

Tree die-back was observed in the New England in the 1880s (Reeve 1988, p.33). Bare fallowing was noted as inappropriate in the 1890s (Reeve 1988, p.38) although it took several decades to cease recommending this practice (see below).

Departments of agriculture were established in all States, and agricultural colleges in some (e.g. Roseworthy in 1883), by 1900 (Reeve 1988, p.39).

(c) entering the century

Donald (1982, pp.55-6) argued that, having undertaken an exploitative phase since first European settlement, Australian agriculture was in poor shape at the opening of the century:

By 1900 wheat yields had seriously declined [cf. his Figure 3-1]; many pastures especially in drier areas had been overgrazed and damaged. ... 1901, the year of federation of the Commonwealth of Australia, saw the lowest point of our agriculture. Wheat yields were desperately low, pastures were deteriorating and both sheep and cattle numbers were declining.²⁰

Society

Agriculture had an essentially European character, indeed an essentially British character, with some contribution from continental European in South Australia German (with later out-migration to southern NSW) and Italian in irrigation areas; in NSW, Italian (irrigation areas and far north coast) and German (southern and north-west broadacre areas); and in Queensland, German in broadacre agriculture, and Italian in the sugar industry. A non-European influence was visible via a Chinese presence in market gardening and land clearing (Rolls 1996, pp.146-50), and Kanak

effect of sheep on pastures.

¹⁶ The effect of (a) different seasonal conditions and (b) movement to less favourable areas is not immediately apparent.

¹⁷ Barr and Cary (1992) provide an excellent overview, especially focusing on areas with Mediterranean climates.

¹⁸ e.g. Barr and Cary (1992, pp.21-4 and 24-8) for weeds and animals (primarily rabbits), respectively.

¹⁹ See also Barr and Cary (1992, p.102). The disappearance of saltbush was noted as a problem in the 1890s (cf. Reeve 1988, p.34).

²⁰ Wheat yields declined as a consequence of wheat growing expanding into areas that were too arid, and soil phosphorus and nitrogen depletion (Donald (1982, pp.62-3). The effects of the great drought 1899-1902 on crop yields and stock numbers should not be ignored.

indentured labourers in the Queensland sugar industry (repatriated following Federation). Indigenous Australians were largely invisible, and confidently expected to disappear.

Economic setting

Butlin (1962a) reconstructed estimates of gross domestic product and related economic variables for the period 1861-1939. Around 1900, the economy was beginning to rise in real terms after the serious depression of the 1890s (Figure A.1.3). The pastoral industry was in decline until just after the new millenium as a consequence of both the depression, and the great drought of the turn of the century. Agriculture (i.e. cropping), although affected by depression and drought, had recommenced growth prior to the new millenium and dairying (combined with forestry and fishing) had, as essentially domestically oriented industries, been less affected by depression. As a proportion of deflated GDP, the pastoral industries had comprised 8-10 per cent of GDP around the new millenium (having fallen from around 16 per cent at the beginning of the 1890s) and reached a nadir of 5.3 per cent in 1902; thereafter, pastoralism recovered rapidly, returning to 16.3 per cent of GDP in 1905, and remaining at that level for the remainder of the decade (Figure A.1.4). Agriculture comprised 4-8 per cent of GDP around the turn of the millenium, and dairying, fishing and forestry around 3-6 per cent of GDP.²¹ The average decennial growth rates for each of the agricultural sectors are reported in Table A.1.2. Of total Australian exports of £28.2 m in 1890, wool comprised 65 per cent, having outstripped gold exports by the 1870s (Butlin, 1971, pp.28,30).²²

The prices indexes of agricultural commodities and manufactures describe a U-shape pattern from 1861 to the early twentieth century (Figure A.1.5). More importantly, however, the prices of agricultural commodities relative to the prices of manufactures generally fell in the decades prior to 1900, except for pastoral products whose prices rose relative to manufactures prices from about 1890 to 1910 (Figure A.1.6).²³

By 1900, some fundamental problems in Australian agriculture had been solved. Commodities like wool had been developed that would bear both internal and external transport costs. The initial development of a road system in the 1870s had begun to lower transport costs, although the full benefits of this development were only realised in the twentieth century with the internal combustion engine (particularly diesel). The rapid spread of railways from the 1880s dramatically lowered transport costs away from the coast (and particularly in NSW), paving the way for the development of additional export crops such as wheat. Refrigeration provided the same benefits for meat and dairy products. Invention of the stump jump plough increased the profitability of agriculture by obviating the need for complete land clearing before the first crop could be sown, and subsequent improvements included wrought steel ploughshares (Wheelhouse 1972, chs.2,4). Invention of the grain stripper and its gradual improvement, improvements in winnowing, and combination of stripping and harvesting into a single machine in the 1880s, enabled substantial expansion of cropping area – particularly in South Australia where acute labour shortages at harvest had constrained wheat industry growth (Wheelhouse 1972, chs.4-5). Stationary mechanical power was applied to sheep shearing in the 1880s and milking in the 1890s (Wheelhouse 1972, chs.8-10); mobile mechanical power was a twentieth century achievement.

Wool was sent to Britain for sale in the earlier part of the nineteenth century, but completion of the Suez Canal and the cable link to Europe stimulated the direct buying of wool in Australia. Pastoral

²¹ While Butlin (1962, Tables 172 and 209, 173 and 210) provided estimates of gross pastoral and agricultural capital formation and livestock investment respectively, comparable labour input data was not estimated, and it does not appear possible to derive even crude estimates of disembodied technological change for 1861-1931.

²² Comparable data after 1890 do not appear to be readily available.

²³ There is a tendency to view the “cost-price squeeze” as a relatively recent phenomenon – e.g. “Australian agriculture has faced a cost-price squeeze for the past twenty years” (Glau 1972, p.33).

houses commenced wool sales in Australia in the mid-nineteenth century, and centralised sales rooms were established in Sydney in 1892 (Dwyer 1998, pp.13-8, 23-6; Davidson 1990a, 154-6).

Evolution

As the Australian epic was played out on stage, the stage itself was continually being renovated by a workforce which combined both the agricultural epic's cast, and itinerant stagehands and journeymen. For example, as the twentieth century unfolded, the Constitution itself evolved, slowly establishing the dominance of the Commonwealth at the expense of the states. This constitutional evolution derived partly from vignettes in agriculture such as the series of constitutional cases testing the validity of agricultural marketing schemes (Coper 1978). The environmental conditions within which agriculture functioned also changed – partly as a direct consequence of the agricultural epic (e.g. irrigation, land clearing, soldier settlement); partly as a consequence of changing production conditions within agriculture (e.g. physical and human capital accumulation in agriculture by both individuals and society, and technological progress); partly as a consequence of private and social investment in production and infrastructure outside agriculture (e.g. transport, processing, public research and development); and partly as an interaction of these factors with climate. The social mix changed rapidly after the Second World War, although this had relatively limited impact in agriculture which retained its essentially European character; exceptions included Vietnamese farmers in the Sydney basin. Post-Second World War immigration also included European expatriate farmers from former British colonies in Africa as those countries gained political independence, and later immigrants from South Africa.

A.2 1900-1930: Peace, War and Peace

Natural resource base

The development of natural resources continued in the twentieth century. The first stage of Australia's first large irrigation water storage, Burrinjuck, was completed by 1915 and the Murrumbidgee Irrigation Scheme was created. Agreement among the Commonwealth and the three south-eastern States led to the creation of the River Murray Commission in 1917 to regulate the river and some of its tributaries (Rural Reconstruction Commission 1945d, para.1685; Davidson 1969, pp.75-6). There was a burst of completions of major storages in the late 1920s – three dams totalling 750,00 acre feet in Victoria in 1927, together with the enlargement of Burrinjuck to 720,00 acre feet also in 1927, and Lake Victoria on the lower Murray (772,00 acre feet) in 1928; construction of the Hume commenced in 1919 but was not completed until 1936 (Davidson 1969, Table 16).

European farmers continued to mine farming natural resources 1910-30 following the nineteenth century pattern. One practice which helped reverse the declining trend in wheat yields to 1900 was bare fallowing, but part of its effect occurred by remedying nitrogen deficiencies through accelerated soil exploitation in the form of "the more rapid breakdown of soil organic matter" (Donald 1982, p.63; cf. Barr and Cary 1992). By 1930 there was widespread concern about the extent of land degradation, particularly soil erosion, although mitigation only commenced subsequently. Salinity was identified as a soil degradation process in Western Australia in the late 1920s (Bolton 1992, p.140). At the end of this period, the first long-term victory was won against an invader – successful biological control was discovered for prickly pear which had rendered useless 25 million hectares of northern NSW and Queensland by 1925,²⁴ and similar controls remained the "holy grail" of agricultural research for the rest of the century. This success encouraged the search for other biological control agents and the next attempted – and spectacularly unsuccessful – introduction was cane toads in the 1930s (Bolton 1992, p.138).

²⁴ And was estimated to be still spreading at 0.5 million hectares per year (Donald 1982, p.72).

Farm production

Aggregate, and sectoral output in agriculture, were reported by Butlin (1962a) for 1900-1930 (Figures A.1.3- A.1.4) and by Powell (1974) for 1920-30 (Figure A.2.1).

Using Butlin's data, the Australian economy grew rapidly in real terms 1900-14 but contracted during the First World War, taking until 1920 to begin recovery (Figure A.1.3). The economy grew rapidly in the first half of the 1920s, but thereafter plateaued until 1930. In the early years of the century, pastoralism continued the massive contraction that had begun in 1895 – it had comprised 13 per cent of GDP in 1894 falling to 8.6 per cent in 1900, and 5 per cent of GDP in 1902. However, pastoralism rebounded rapidly to 21 per cent of GDP by 1905. Pastoralism again contracted sharply in the first half of the 1910s, but recovered rapidly during the War; thereafter the industry was on a generally rising trend, but with substantial variability (Figure A.1.3). Agriculture exhibited little output trend, but considerable variability, until about 1908; it then grew rapidly to a temporary peak in 1916, peaked in 1921 and contracted during the remainder of the 1920s (Figure A.1.3 and Table A.1.2). Since Dairying etc. had entered the new millenium in a boom, it actually contracted in the first decade (by 1.9 per cent p.a.) but thereafter grew by 2.6 per cent p.a. in the 1910s and 6.6 per cent p.a. in the 1920s (Figure A.1.3 and Table A.1.2).

Using Powell's (1974) aggregate data and ignoring the low value for gross agricultural output in 1921, the value of gross output and value added remained static throughout the 1920s (Figure A.2.1). Because the number of farm proprietors increased during the decade, value added per proprietor fell 14 per cent during the decade (Figure A.2.1).

Using Butlin's price index data, and noting major peaks and troughs in the relative price of primary commodities to manufacturing commodities, there was a continuing secular decline in the price of pastoral, agricultural and "dairy etc." products relative to manufactures in the three decades to 1930. While there were major cycles in pastoral prices, there was no major trend in relative pastoral prices until the end of the 1920s (Figure A.1.6). Davidson's (1981, Table 13-1) data for major commodities show nominal prices rising, except for wheat, during the War, and the subsequent and dramatic falls in product prices after the early to mid-1920s (Figure A.2.2). Livestock prices exhibit a similar pattern (Figure A.2.3). At War's end, farm worker wages were substantially higher than pre-War, and continued to rise through most of the 1920s (Figure A.2.4).²⁵ At wartime product prices, these wage levels were less problematic but, as agricultural product prices fell during the 1920s, wages constituted an increasing burden on farms employing labour. For the complete output price series wool and wheat up to 1930, the wool price trended upwards relative to farm wage rates to 1924-25 and then fell, whereas relative wheat prices trended downwards (Figure A.2.5). Draughthorse prices fell from 1912 (Figure A.2.4).

The First World War rudely interrupted agriculture by reducing the labour force by 27 per cent, and interfering with agricultural marketing as 48 per cent of agricultural production was exported and Britain alone imported 44 per cent of Australia's exports.

Davidson (1981, pp.269-71) argued that dairy farmers, especially those milking 30 or more cows, were reasonably prosperous. Incomes of farmers in the beef/sheep zone declined dramatically immediately after the War but, due to buoyant wool prices through most of the 1920s, this form of farming was reasonably prosperous in most of this period (Davidson 1981, pp.271-74). Returns for wheat/sheep farms with at least 60 hectares (150 acres) of wheat and grazing 250 sheep were probably satisfactory, although smaller farmers were likely to have been in greater difficulty (Davidson 1981, pp.274-282). Davidson (1981, pp.283-4) suggested that larger-scale graziers in the southern pastoral zone were likely to have made satisfactory profits during the 1920s. Sugar

²⁵ The Rural Reconstruction Commission (1945b, Appendix 3) reviewed the history of rural wage regulation.

producers were likely to have been better off in the early 1920s than later, and even worse off during the War (Davidson 1981, pp.284-6).

Agricultural technology continued its rapid change in the first three decades of the century, with greater emphasis than previously on the biological aspects of agriculture. Farrer released his first purpose-bred wheat variety (Federation) in 1901, and there was deliberate search for Mediterranean legumes that would withstand harsh summers in southern Australia (Donald 1982, p.61-2). The importance of phosphorus had been recognised by 1900, and its use rapidly increased in the 1920s (Rural Reconstruction Commission 1945b, Figure 7). In the 1920s it was discovered that the successful use of the annual temperate legume subterranean clover required the use of phosphatic fertiliser under Australian conditions (Davidson 1981, p.322).²⁶ With the benefit of hindsight, some practices which improved yields also degraded resources, such as the impact of bare fallowing on reducing soil organic matter and increasing susceptibility to erosion (Donald 1982, p.63-4).

Improvements in farm technology continued via imports (of both machines and ideas) and domestic manufacture, the latter stimulated by tariffs from 1906, leading to the “harvester” (Wheelhouse 1972, chs.6-7).²⁷ Early in the century there were experiments in using steam traction engines for large-scale land clearing, and subsequently crude oil burning tractors were imported and locally modified (Wheelhouse 1972, ch.10). The rotary hoe was invented in Australia just before the war, and manufactured subsequently (Wheelhouse 1972, ch.10).

As shown in Figure A.2.6, the 1920s were a period of rapid growth in the non-land capital stock and relatively sluggish growth in gross agricultural output. Not surprisingly, the rate of disembodied technological change in agriculture was negative (Table A.2.1).

Marketing systems

Government controls on food processing commenced in the mid-nineteenth century. For example, in Sydney, the meat slaughtering industry had, by 1848:

created a public nuisance that had become intolerable. ... pigs, fed on offal, roamed around; blood ran down the gutters; offal was carted down to Darling Harbour and Sydney Cove; at low tide the mud flats reeked with noisome, putrid, flesh. (Walker and Roberts 1988, p.52)

Initially, the problem was solved by transferring slaughter to a new abattoir on Glebe Island. Later nineteenth century legislation attempted to control livestock disease in NSW (Walker and Roberts 1988, p.59). Health problems resulting from consumption of dairy products led to public controls on dairy production and processing in NSW in the last quarter of the nineteenth century (Walker and Roberts 1988, p.58). Just before the new millenium, and “tardily following the example of other colonies”, NSW passed a Public Health Act in 1896 (Walker and Roberts 1988, p.59). Milk was the most heavily sampled commodity, and “In 1901, 10 per cent of the milk samples taken were found to be adulterated either with water or preservatives”; in 1906, dilution of milk was recorded up to 21 per cent (Walker and Roberts 1988, p.59). These initial controls were subsequently reinforced by the Pure Food Act of 1908.

A NSW Royal Commission of Inquiry into food supplies and prices reported in 1913. This report included findings of attempted but unsuccessful price fixing in baking and dairy supply, and successful price fixing in meat (Walker and Roberts 1988, p.61-2). The Report recommended that the Glebe Island abattoir “be no longer leased to the highest bidder, which had suited the [pastoralists’] Combine” (Walker and Roberts 1988, p.62).²⁸

²⁶ Ironically, it was discovered much later that – unless carefully managed – this system would contribute markedly to soil acidification.

²⁷ And leading to the “Harvester” judgment which had long-term impact on the domestic labour market,

²⁸ An early illustration of the capture theory of politics.

The Glebe Island abattoir was eventually closed, and replaced under 1915 legislation by the Homebush abattoir close to the livestock yards at Flemington. The new Metropolitan Meat Industry Board took over all slaughtering in Sydney and inspected all carcasses imported into the region, and managed the Ultimo public meat markets. The leasing arrangements – whose termination the 1913 Report had recommended to control price fixing – were eventually replaced in 1934; this Act also controlled the foreign ownership of two privately-owned meatworks in Sydney (Walker and Roberts 1988, p.86-7).

During the War:

... the Interstate [sic] Commission detected combines in meat, rice, salt, cereal foods and jam. Apart from price control, no action was taken and it was the Interstate Commission rather than the restrictive practices that went out of existence. (Walker and Roberts 1988, pp.81,86)

Margarine, invented in 1869, was first manufactured in NSW in 1888. The Victorian Parliament passed the first anti-margarine legislation in 1893; in NSW supervision of its manufacture passed from health to agriculture authorities in 1915 under the Dairy Industry Act (Walker and Roberts 1988, pp.90-1).

The Queensland Government implemented the prototype of Australian statutory marketing schemes in 1915 by legislating for the compulsory acquisition of sugar, and negotiating with private companies to process and market on both domestic and export markets (Rural Reconstruction Commission 1946, p.250). This experiment was extended to wheat under Queensland's *Wheat Pool Act 1920* (Rural Reconstruction Commission 1946, p.276).

The Grain Elevators Board of NSW was created by legislation in 1916 to bulk handle wheat, and 180 concrete grain silos were completed by 1920; Western Australia followed suit in 1929 (Wheelhouse 1972, pp.115, 118).

Trade

In the late 1920s, the United Kingdom was the dominant market for Australian exports of butter and cheese, mutton and lamb, apples and pears, canned fruit, dried vine fruit, wine and sugar (Table A.2.3). The United Kingdom also purchased about half Australia's beef and veal exports, and one-third of wool and wheat. Apart from wartime exigencies, public intervention in exports only became a factor affecting agricultural exports towards the end of the period.

Exporting became increasingly difficult during the 1920s as international agricultural export prices fell (Rural Reconstruction Commission 1946, pp.164). Both caused by, and interacting with, increasingly competitive world (agricultural) markets in the post-War period, importing nations began to devise mechanisms to protect domestic industries, including their domestic agriculture (Harris 1967, p.322).

Market conditions

In the euphoria of the Great War's end there was an expectation that new higher price level had been attained 1919-20 (Rural Reconstruction Commission 1944a, para.56), and this expectation affected, inter alia, government enthusiasm for soldier settlement schemes. However, as shown in Figures A.1.5-A.1.6, A.2.2-A.2.3 and A.2.5 this higher price level – in both nominal and relative terms – did not survive the mid-1920s.

Experiments with government marketing intervention commenced in the sugar industry, as part of the Federation agreement, to offset increased labour costs following repatriation of Kanak labourers by protecting the domestic market. State intervention by Australian Federal and State Governments, and the British Government, was undertaken during the First World War to manage the marketing of wool, wheat, butter and sugar. The success of this emergency venture persuaded Australian governments that similar intervention could be undertaken in peacetime (Davidson 1981, pp.264-5). The pressure on prices, and therefore incomes, in the later 1920s – exacerbated by increased output stimulated by the post-War soldier settlement schemes and the precarious income position of the settlers – prompted searches for ways to defend farmers’ incomes.

Additional experiments in market intervention commenced in the butter and dried vine fruits industries in the 1920s with a combination of private intervention supported by government. A voluntary equalisation scheme for butter commenced in 1927, increasing butter prices by 10-17 per cent (Davidson 1981, p.271). In 1926, Queensland commenced regulating its own agricultural industries under the Primary Producers’ Organization and Marketing Act (Rural Reconstruction Commission 1946, p.274). Following a conference in Bathurst (NSW) in 1926, NSW enacted its *Marketing of Primary Products Act 1927* and also began exploring ways of assisting farmers by market intervention. Price interventions in 1900-30 are summarised in Table A.2.2 similarly to Lewis’ (1967, Table 15-1) tabulation for the mid-1960s (cf. also Lloyd 1982 and Mauldon 1990).²⁹

Physical infrastructure

For a geographically remote industry like agriculture, public capital is important for agriculture to obtain inputs, and for the marketing of outputs. General infrastructure like roads and railways were the means by which inputs like machinery and materials moved from manufacturing site (which might be other farms) to their site of use. More remote infrastructure – like ports – were also important for imported items. On the output side, roads and railways were also important to transport agricultural produce to domestic markets, or to ports for export. Although the major expansion of rail had ended by 1900, the network was still expanding to 1941 (Hoffman 1967). Powell (1974) crudely estimated the public capital stock involved directly in farm production which increased over 40 per cent in the period 1921-30 (cf. Figure A.2.1).

Agriculturally-specific capital was also important to directly support farming activities. This ranged from irrigation dams (cf. Davidson 1969), to the facilities of the State agriculture departments which had been established in the late nineteenth century. States were also involved in land settlement which sometimes involved government investment in land clearing. Some more generic forms of capital were also important for agriculture. These included the agricultural colleges and universities, and CSIRO (established in 1926) (Davidson 1981, pp.296-7).

*Social infrastructure*³⁰

Access to social infrastructure in rural areas depended on location, transport and income. In the better-watered and therefore more closely settled districts, access to the services of smaller towns provided basic retail, financial, medical and educational services. In drier districts, where farms were larger and distances between towns commensurately greater, access to basic services was more difficult. The development of motor transport, particularly after the First World War, improved access to services where distance was an important factor. The development of air services, especially in the remote areas, became of great importance particularly for medical services (e.g. the Royal Flying Doctor Service established in 1927). For wealthy rural dwellers, mainly pastoralists, access to services was substantially better, even if it required travel to the

²⁹ cf. Rural Reconstruction Commission (1946, Appendix 1); this summary included both peacetime arrangements and short-term wartime arrangements for agricultural commodities.

³⁰ See Davidson (1992a, pp.327-31).

nearest metropolis (or even Europe) and sending children away to school in the metropolis. Even in the mid-1940s, access to services in rural areas was poor (Rural Reconstruction Commission 1945c).

Intersectoral linkages

During the First World War, the need to replace pre-War imports of manufactures led to the expansion of manufacturing industry by more than 50 per cent, and to the use of tariffs post-War to protect these industries against subsequent import competition (Davidson 1981, p.267). Such tariffs increased the price of imported farm inputs but, more importantly, supported higher wages and prices of domestic manufactures (including farm inputs) at a time when agricultural product prices were falling compared to their wartime highs.³¹ Value added in manufactures expanded more rapidly after 1900, with major dips during the War and the Great Depression (Figure A.1.3). As a consequence, the share of GDP from non-mining primary production fluctuated around 20-25 per cent of GDP after 1910 except for the War and Depression. Value added in the mining sector trended consistently downwards from just after 1900 until 1930 (Figure A.1.3), increasing the importance of agricultural products as sources of export income.³² Devaluation of the Australian currency through the 1920s improved the position of exporters, although the competitive international devaluations of the 1930s blunted this advantage (Cain 1970).

The vision thing

There was an ambitious soldier settlement scheme following the First World War (Davidson 1981, pp.286-296; Rural Reconstruction Commission 1944b). Davidson (1981, p.286) argued:

As farming had been a prosperous occupation during the war it was thought that the offer of farms to ex-servicemen was a suitable way of rewarding them for their services. In addition, it would solve the problem of a large number of men entering the work force over a short period

The combination of generally lower prices for agricultural commodities in the second half of the 1920s, and higher input prices and wages, meant that farming profitability was lower than these expectations suggested. The need to find quickly large areas to settle ex-servicemen, together with generally high agricultural prices in the mid-1920s, drove land prices up, and also the prices of livestock and farm inputs. Since the “home maintenance area” concept was used to determine that size of soldier settlement farm, temporarily high commodity prices when the schemes were designed meant that farms subsequently became uneconomic when commodity prices fell. Additionally, the lack of capital and farming experience and skills – and, in many cases, war injuries – meant that many ex-servicemen had extremely poor prospects of financial survival. Many ex-servicemen were settled on irrigation farms. Davidson (1981, pp.290, 295) concluded that:

... the [ex-servicemen] settler relying on borrowed money had no hope of surviving in any type of farming except dairying. Only those with substantial amounts of their own capital could possibly succeed in other types of farming.

Attempts to settle ex-servicemen on small irrigated holdings or poultry farms were even less successful than those aimed at settlement on broad-acre farms.

The Rural Reconstruction Commission (1944b, paras.125-46) published a damning critique of post-WWI soldier settlement.

³¹ cf. the 1970s debate below concerning the effect of tariffs on exporting industries generally.

³² cf. Gregory (1976) on the much later reverse effect; see §A.5.

A.3 1930-1950: Depression, War and Recovery

Natural resource base

After the First World War, marginal wheat lands were sub-divided by State governments because of apparently favourable economic conditions. The Rural Reconstruction Commission (1944d, para.610) argued that these farms would never have been environmentally suitable for wheat growing. In the Hillston-Lake Cargelligo area of NSW, for example, while soils were “fairly good” rainfall was “slight” and “uncertain” especially at critical crop times; clearing of the mallee rendered the land prone to sheet erosion (Rural Reconstruction Commission 1944d, Appendix 1). There were similar problems in Victoria, South Australia and Western Australia. Failure of these sub-divisions became apparent soon after settlement, and substantial reconstruction occurred during the 1930s (Rural Reconstruction Commission 1944d, paras. 611-4, Appendixes 1-3). Reconstruction of other settlement schemes was also required in Victoria, NSW and Western Australia (Rural Reconstruction Commission 1944d, paras. 615-26).

The 1930s mark the beginning of a widespread recognition that Australia’s agricultural resources might not be capable of indefinite expansion.³³ This doubt reinforced the pessimism induced by the Depression and particularly by serious difficulties for agricultural marketing, especially in the first half of the 1930s. There was particular concern with soil erosion and soil fertility decline (Rural Reconstruction Commission 1944c, paras.334-362). With high rainfall variability, and the ever-present risk of intense rainfall events, soil erosion was exacerbated by the widespread practice of bare fallowing (cf. §A.2). The first State-run soil conservation service was established in NSW in 1938, quickly followed by Victoria; other States were slower to establish effective services – or even to recognise that they had a soil conservation problem (Rural Reconstruction Commission 1944c, para.363). The Rural Reconstruction Commission (1944c, paras.386-391) noted that previous efforts at land clearing had been unwise (and uneconomic), and identified what it saw as serious errors in the clearing of forestry resources, and noted development of a “national conscience” with regard to national parks (Rural Reconstruction Commission 1944c, para.393). Even where resources were “improved”, there might be associated externalities – e.g. the Rural Reconstruction Commission (1945b, paras.1393-1404) noted the disastrous Victorian grass fires of 1944 which resulted in insurance claims for damage of £1 million. The Commission noted suggestions that pasture improvement had been partially responsible for increased risks because of the higher consequent fuel loads. Even where regulation of land management was attempted, government failure was an ever-present risk. The Rural Reconstruction Commission (1945b, paras.1153-55) drew attention to a variety of “unfortunate attempts at regulation and control”, including rabbit control,³⁴ wind erosion and sand drift, and irrigation control.

Development of irrigation schemes, planned or commenced in the more prosperous previous period, continued (Wyangala (NSW) 0.3 million acre feet, completed 1935; Hume (NSW/Victoria) 1.25 million acre feet, completed 1936) (Davidson 1969, Table 16). Groundwater resources were also noted as being susceptible to degradation. The Rural Reconstruction Commission (1945d, paras.1848-9) noted that bores in the Great Artesian Basin were already beginning suffer reduced flow, or even to fail.

With growing optimism as an Allied victory in the Second World War became increasingly probable, the Rural Reconstruction Commission (1944c, para.400) cautioned against the growing optimism for large-scale post-War development of agriculture:

³³ There was, of course, continued search for means of expanding the resource base, including through irrigation, pasture improvement, improved technology, and development of new lands (e.g. in northern Australia).

³⁴ The contemporary status of rabbit damage and control was reviewed by Rural Reconstruction Commission (1945b, Appendix 1).

The Commission has noted with alarm a tendency on the part of private persons and, in some cases, of public officials, to think of settlement promotion only in terms of land resources and the physical capacity to produce. ... More intensive development is a most desirable objective, but to attempt production without a reasonable expectation that the Australian domestic market coupled with international demand will be able to absorb the added production at a payable price, is courting financial disaster. Yet, strangely, in reviewing the evidence put before us, it is difficult to find projects for land settlement, except for citrus production, which were advanced on the sole inspiration that they were designed to meet a known demand for a product.

In part this reaction reflected official pessimism that post-World War Two economic experience might mirror the post-World War One collapse of commodity prices. However, the Rural Reconstruction Commission view also reflected the growing influence of economics in the intellectual debate about the efficient use of social resources.

Farm production

Powell (1974) showed that gross farm output plateaued under the impact of Depression in the 1930s, fell 25 per cent 1938-45 as a combination of diversion of resources into the war effort and drought in the mid-1940s, and then commenced an upward swing to the boom of the early 1950s (Figure A.2.1). Value added in all agriculture, however, exhibited a substantially different pattern of progress (cf. Figure A.2.1). Value added rose from 1930 to a peak just before the Second World War, and then declined until the mid-1940s. After the War, value added recovered rapidly to a new plateau which was maintained throughout the 1950s.

From Davidson's price data, nominal prices bottomed out in the mid-1930s and then commenced to rise (Figures A.2.2- A.2.3). Wages exhibited a similar pattern but, after the Depression, rose more slowly than commodity prices so that prices of commodities relative to wages actually rose for most of the 1930s, falling only after 1937 (Figure A.2.5). The prices of farm inputs reported by the Rural Reconstruction Commission (1945b, Figures 9-16 showed that many farm input prices fell from about 1931 and, in many instances, continued falling throughout the 1930s. Rapid increases in these prices commenced in the late 1930s.

Davidson (1981, pp.304-320) calculated the financial position of farmers in the 1930s and 1940s. During the early 1930s, prices were disastrously low. Many, although not all farms, had cash returns insufficient to maintain the farm family, even if farm debt was ignored. For example, family expenses were estimated to have exceeded farm cash returns on beef/wool farms; and on wheat/sheep farms in most regions except large farms above 520 hectares (1280 acres) on the northern slopes of NSW and above 780 hectares (1920 acres) in southern NSW. By 1937-38, only larger beef/sheep properties (above 260 hectares or 640 acres) had cash income exceeding household needs. On wheat/sheep farms, only small farms (below 320 acres or 130 hectares, and in some cases farms below 640 acres or 260 hectares) could not meet household needs. On dairy farms and in the pastoral zone, financial conditions appeared to be satisfactory even at the depths of the Depression.

The financial position of most farmers during the Depression limited the opportunity for many to innovate new technologies that had become available, both because resources were unavailable to purchase new machinery and because the opportunity cost of farm labour had fallen in the Depression. Approximately 10 per cent of farms had tractors by 1930 (Davidson 1981, p.321-2). The return to farm profitability during the 1930s provided the opportunity for the beginnings of a rapid increase in tractor numbers and this growth continued in the first part of the Second World War (Rural Reconstruction Commission 1945b, Figure 5). Probably only about 13 per cent of farms had tractors by the end of the 1930s, although this was sufficient to permit about half the

cropping to be undertaken by tractors (Davidson 1981, p.321-2 and Table 15-10). During the latter part of the War tractor numbers stabilised as materials were diverted to defence needs, but horse numbers fell substantially as available manpower was diverted into the forces (Rural Reconstruction Commission 1945b, Figure 6). By the late 1940s, about 80 per cent of cropping was estimated to have been tractor-powered (Davidson 1981, Table 15-10).

The innovation of subterranean clover based pastures proceeded slowly during the Depression (Davidson 1981, p.321-2). Superphosphate use slumped in the early 1930s with the onset of Depression, but soon commenced rising slowly, and by the mid-1930s was rising rapidly. Use of other fertilisers was low (Rural Reconstruction Commission 1945b, Figure 7 and para.1220 respectively). By about 1950, the benefits of new technologies – especially nitrogen inputs from clover ley farming supported by superphosphate applications – had generally been appropriated across Australia by 1950, and wheat yields had again plateaued (Donald 1982, Fig 3.1).

By contrast with the 1920s, there was little agricultural investment in the 1930s; since output increased rapidly in this decade (Figure A.2.6), the rate of disembodied technological change was rapid (Table A.1.2). In the 1940s, under the exigencies of war and limited materials available in the immediate post-War period, the non-land capital stock declined. Output declined at a more rapid rate (cf. Figure A.2.6) and thus there was a low positive rate of disembodied technological change during the 1940s (Table A.1.2).

Marketing systems

During the period 1930-50 there was a slow evolution towards more government intervention in marketing channels. NSW had commenced statutory intervention in milk marketing in 1929 with the creation of the Milk Board which controlled prices and compressed margins for milk supplied in the metropolitan area (Walker and Roberts 1988, p.87). Other States subsequently regulated their wholemilk industries (Western Australia 1932; Victoria 1933; Queensland 1938 – Rural Reconstruction Commission 1946, pp.273-9). In 1933, short-lived NSW regulations prohibited margarine from resembling butter; the Commonwealth only permitted the importation of pink margarine:

In 1892 politicians had blamed margarine as a detestable article, now they intervened to ensure that it was one. (Walker and Roberts 1988, p.91)

State disunity on the margarine issue forestalled implementation of proposed Australian Agricultural Council composition controls in 1935 and 1938, but finally the States agreed to quotas on table margarine in 1940 (Walker and Roberts 1988, p.92).

Under NSW's *Marketing of Primary Products Act 1927*, marketing boards were created for rice, eggs, some wine grapes and ginger, and Victoria followed suit in 1935 with boards for onions, chicory, maize and eggs. Under its 1926 Act, Queensland had boards for 12 agricultural commodities from arrowroot to peanuts, with separately-constituted boards for fruit (Committee of Direction of Fruit Marketing) and wheat (Rural Reconstruction Commission 1946, pp.272-5).

As noted above, NSW had legislated for its Grain Elevators Board in 1916 and Western Australia in 1929. Victoria legislated for its Grain Elevators Act in 1934 (Rural Reconstruction Commission 1946, p.274).

Trade

The 1930s Depression intensified the evolution of international (agricultural) protectionism which began to emerge in the 1920s (Harris 1967, p.322). The onset of Depression increased the

importance of UK markets to Australian exporters. For example, butter and canned fruit exports to the UK in 1930/31 were nearly double average 1926/27-1928/29 levels. Over the same period, Australian exports to the UK of mutton and lamb increased by about 50 percent; and exports of cheese, apples, and raisins and currants increased about 40 per cent (Rural Reconstruction Commission 1946, para.2218). As export markets collapsed with the onset of Depression, nations implemented beggar-thy-neighbour trade policies to attempt to maintain domestic prosperity.

The Ottawa Conference convened in 1932 in an attempt to protect British Empire countries by guaranteeing markets within the Empire. The principal means of doing so was by reciprocal preferential tariffs for imports from Empire countries compared to others.³⁵ Exports of Australian cheese to the UK quadrupled 1930/31 to 1938/39; exports to the UK of beef and veal, and canned fruits, more than doubled over the same period; and exports of butter, mutton and lamb, and apples increased around 50 per cent (Rural Reconstruction Commission 1946, para.2218). Canned meat exports were increasingly diverted from “other British” countries to the UK, whereas these “other British” increased their share of Australian exports of canned fruit and dried vine fruit compared to the UK (Rural Reconstruction Commission 1946, pp.40-1; cf. Table A.2.4). The Rural Reconstruction Commission (1946, para.2216) argued that the “Ottawa Agreement has dominated Australia’s external economic policy since 1932” although recognising that not all the increased exports to the UK were the result of Imperial Preference resulting from Ottawa (Rural Reconstruction Commission 1946, para.2219).

The Ottawa Agreement did not benefit wool and wheat producers since the Empire was a net exporter of these commodities. An attempt to manage world wheat markets failed when the International Wheat Agreement of 1933 failed. The primary objective of Australian trade treaties of the 1930s “was to protect and, if possible, the extend the Australian [export] market for wool” (Rural Reconstruction Commission 1946, paras.2222-3, 2226).

During the Second World War there were major efforts to secure the international trading environment in the post-War world. Objectives included stabilisation of the general international trading environment through the Atlantic Charter and United Nations’ Conferences (especially Bretton Woods), and efforts specifically directed at food and agriculture (Rural Reconstruction Commission 1946, paras.2235-8 and 2267-76, and 2241-2266 respectively). The Rural Reconstruction Commission (1946, paras.2230, 2305) expected that, as a consequence of increasing internationalism, the Ottawa Agreement would come under increasing pressure post-War. It was also expected that, as a consequence of the expansion of British agriculture during the War, Australian producers would need to develop new export markets (Rural Reconstruction Commission 1946, paras.2259-60, 2281, 2298-2304).

During the 1930s and 1940s, Australian agricultural exports comprised significant proportions of international trade for some commodities (Harris 1967, Table 16-3). Australian wool comprised 30-40 per cent of world trade. Other commodities where Australian exports were significant included wheat (9-16%), beef and veal (15%), mutton and lamb (12-26%), butter (16-22%), processed eggs (up to 19%) and dried vine fruits (17-22%). Since the large number of small farmers in most industries could not combine to limit supply (except for sugar), and since there were no successful international commodity agreements to manage price, Australia was a price taker on world commodity markets despite significant trade shares in some commodities.

Market conditions

³⁵ For example, for Australian imports of UK commodities, there was a mandatory margin of approximately 20 percentage points between the tariff applying to UK imports compared to imports from other countries enjoying most favoured nation status with Australia (Rural Reconstruction Commission 1946, para.2220).

The tentative beginnings of peacetime market intervention in sugar (from 1900) and butter and fruit in the 1920s were broadened in the 1930s under the financial pressures of Depression (cf. Table A.3.1). A variety of commodity-specific measures were utilised, including two-price schemes, commodity bounties, and export subsidies.³⁶ Non-commodity-specific measures included debt relief, post-drought restocking assistance, and fertiliser subsidies. State-level statutory marketing boards were created to operate schemes that price-discriminated between domestic and export markets, or between classes of domestic consumers (Davidson 1981, pp.301-302). Domestic-export two-price schemes required either voluntary agreements to divert product to less-profitable export markets (e.g. butter, replaced by a compulsory scheme in 1934-35) or (compulsory) acquisition of sufficient commodity by a monopoly marketer to export in order to support domestic prices. Implicitly, the success of two-price schemes also relied on an absence of import competition, through import bans or tariffs, or voluntary agreements with other countries (Table A.3.1). The Rural Reconstruction Commission (1945b, paras.1151-2, 1160-9) drew attention to a variety of “unfortunate attempts at regulation and control”, including wheat payments, milk prices, and input controls, commenting that:

“The fact that many other countries have adopted similar devices [to assist farming industries] does not alter the fact that they are both politically troublesome and financially awkward for the governments concerned” (Rural Reconstruction Commission 1944a, para.61)

Prices for major agricultural commodities rose during the War, and – despite fears to the contrary (cf. Davidson 1981, p.344) – continued to rise during international reconstruction for the remainder of the 1940s except for a slight dip in wheat and wool prices in 1949 (Figure A.3.1).

As in the First World War, government intervened in the Second to manage the disposal of agricultural production, involving UK Government purchases of the total wool clip, and surplus meat, dairy produce, eggs and dried and canned fruit (Davidson 1981, pp.325-6). The Australian Wheat Board was created to purchase, control storage of, ship and sell the wheat crop, with prices negotiated with the British Government (Davidson 1981, pp.326-7). The first wheat stabilisation scheme was created in 1948.

Physical infrastructure

Davidson (1992b, p.343) noted that the most important off-farm changes for agriculture in the 1930s affected communications, with increases in car numbers and, by the end of the 1930s, extensive use of trucking for transport of farm produce.

The Rural Reconstruction Commission (1945b, para.1299-1300) noted a “tendency to develop non-paying railway lines” and for pressure to subsidise the carriage of farm produce. In discussing the problems of ensuring rural water supplies, including for irrigation, Rural Reconstruction Commission (1945c, para.1550) noted the strong competition likely in the post-war period for capital investment in rural areas from education and extension, health, transport, housing and electricity services. In a separate report, Rural Reconstruction Commission (1945d, paras.1680-3) argued that irrigation was important for the expansion and development of agriculture generally, and that some enterprises (e.g. rice, dried vine and canning fruits) were dependent on irrigation. In considering the future, however, the Rural Reconstruction Commission (1945d, para.1718-9) recommended “that, before any irrigation scheme is adopted, it is necessary that the proposal should have been examined and favourably reported on from the point of view of the purposes to which the impounded water is to be put” and ridiculed the view ““Here is a nice stream, let us use it for irrigation””. Its strictures had little effect.

³⁶ The Rural Reconstruction Commission (1946, Appendices 1, 2,3 respectively) provided an extensive summary of marketing arrangements (including support measures) for agricultural commodities; estimates of the value of marketing assistance to the Australian rural industries; and a detailed review of the development of the wheat stabilisation arrangements.

The rural credit industry comprised private lenders, insurance companies, rural suppliers and pastoral houses, cooperatives, the trading banks (the most important source of farm credit), and government banks and other agencies (Rural Reconstruction Commission 1945a, paras.797-876).

Rural Reconstruction Commission (1944a, para.106; 1945b, paras.1073-1111, 1176-1203) argued that there were inadequate extension personnel and technology diffusion programmes available in the States to support the necessary educational services to farmers in an agriculture becoming increasingly dependent on human capital.

Social infrastructure

The Rural Reconstruction Commission was generally critical of the education system available to rural communities in the 1940s. These criticisms covered the full gamut of education services, and included the relevance of the curriculum (Rural Reconstruction Commission 1944a, paras. 103-4; 1945b, paras.1032-71; 1945c, paras.1465-1516). Rural Reconstruction Commission (1945, chs.5-8 also noted existing limitations of health, telephone and electricity services in rural areas, and limitations of amenities in country towns. Davidson (1992b, p.343) argued that some of these disadvantages were beginning to be overcome by improved transport (e.g. school buses improving access to education) and the advent of wireless dramatically increased rural peoples' access to the outside world.

Intersectoral linkages

The Australian manufacturing sector suffered a much more immediate and severe impact from the Depression of the 1930s than did agriculture (Figure A.1.3). Agriculture (i.e. cropping) had borne a severe decline in value added in the first half of the 1920s, and income had continued to fall until about 1930. Conversely, value added in both pastoral and dairy etc. industries increased throughout the 1930s until a check to pastoral industry growth in the late 1930s. Where farm incomes were low, farm families retained the major advantage of having readily available resources to provide for immediate needs, although the demands for non-farm commodities and services would have been lower than usual. Further, once the immediate trough of depression had passed, farm output prices rose relative to manufacturing prices (Figure A.1.6), suggesting that real incomes in farming were rising relative to real non-farm incomes.³⁷ These changes were sufficient to induce rapid investment in farm tractors in the late 1930s (Rural Reconstruction Commission 1945b, Figure 5).

The Second World War had a much more pervasive effect on the economy than the First, although Australia was still relatively lightly affected compared to other belligerents. A major effect was the mobilisation of manpower for the armed forces and munitions industries, which shows up indirectly through the marked reductions in horse populations – with their large complementary labour requirements – during the War (Rural Reconstruction Commission 1945b, Figure 6). A second effect was the national control of procurement of agricultural production, principally to ensure food supplies for Allied forces. In the post-War period, the reversion to civilian economy was slow, and retarded agricultural recovery from both the wartime economy and the preceding Depression.

A.4 1950-1970: Good Times Plateau

Natural resource base

³⁷ Prices of many farm requisites either continued to fall through much of the 1930s, and/or did not commence rising until the late 1930s (although there were sharp price rises at the end of the 1930s) (Rural Reconstruction Commission 1945b, Figures 8-16.)

The period 1950-70 was generally a good rainfall period with above-average rainfall in eastern Australia except for severe but short droughts in 1965-66 and 1967-68. In Western Australia, the period appeared to be one of generally rising average rainfall (Figure A.1.1).

Major irrigation water storages completed during the period included: Victoria (Eildon enlargement, 2.7m acre feet); NSW (Glenbawn, 0.3m acre feet; Keepit, 0.3m acre feet; Menindee, 1.5m acre feet; Burrendong, 1.3m acre feet); Victoria/NSW (Hume enlargement, 2.5m acre feet) (Davidson 1969, Table 16). Additionally, major Snowy Scheme works comprised Eucumbene (3.9m acre feet), Tantangara (0.2m acre feet), Jindabyne (0.6m acre feet), Blowering (1.3m acre feet) and Talbingo (0.7m acre feet) (Davidson 1969, Table 61). In NSW, the additional water from the Snowy works were mainly used to create the Colleambally Irrigation Area (approximately 0.2 million hectares). Victoria's Snowy waters were used to intensify existing irrigation (Hoffman 1967, p.255).

Soldier settlement after the Second World War was attempted on a less heroic scale than after the Great War. Hoffman (1967, p.231) reported that approximately 5.6 million hectares of land were allocated – of which at least 1.2 million hectares was “new” land – into about 9,000 farms. Several other individual schemes were undertaken or commenced during the 1950s and 1960s. These schemes included development of approximately 4.2 million hectares of brigalow lands in Queensland, largely for grazing;³⁸ approximately 0.35 million hectares of trace element treated lands on the South Australian-Victorian border (Ninety Mile Desert); and approximately 0.6 million hectares around Esperance in Western Australia (Campbell 1982, pp.234-5; Hoffman 1967, pp.235-6). Donald (1982, pp.59-60) reported a rate of new land clearing in WA in late 1960s of 400,000 ha per year. By contrast, public protests prevented development of the “Little Desert” scheme in Victoria at the end of the 1960s (Donald 1982, p.75; Bolton 1992, pp.159-60; Libby 1998).³⁹

Gretton and Salma (1996, Appendix C) reviewed the sketchy evidence available concerning changes in the state of the (agricultural) environment). Between 1941-43 and 1967 in the eastern and central divisions of NSW, there was a 10 per cent increase in the area affected by “moderate” gully erosion and a 7 per cent decrease in the area affected by “severe” gully erosion; a 44 per cent decrease in the area affected by sheet erosion; a 28 per cent reduction in the area affected by “moderate” wind erosion and a 34 per cent reduction in the area affected by “severe” wind erosion (Gretton and Salma, 1996, Table C.2). These generally beneficial changes were reported to have resulted from pasture improvement, fertiliser use, rabbit control, improved pasture management, and crop rotation including legumes replacing wheat monoculture; Gretton and Salma (1996, p.C4) noted, however, that fertiliser/legume changes subsequently created acidity problems.

The second dramatic biological success against a scourge occurred in the early 1950s with the successful release of myxomatosis.⁴⁰ Other, less-dramatic but equally valuable biological controls successfully innovated by 1970 included the introduction of Zebu strains into northern Australian cattle herds, and the development of rust-resistant wheat varieties.

Farm production

Powell's (1974) showed that gross farm output rose rapidly throughout the period 1950-70, increasing on average 3.3 per cent per annum. Value added in all agriculture, however, exhibited a substantially different pattern (cf. Figure A.2.1). Value added achieved a fluctuating plateau by 1950 which was maintained until the mid-1960s. In the latter half of the 1960s, a higher plateau of value added appeared to have been achieved but with considerable annual variability. Ignoring the

³⁸ Much of this land had earlier been overrun with prickly pear (Hoffman 1967, p.237).

³⁹ This appears to be an early example of an unholy alliance between environmentalists and economists.

⁴⁰ The effect of rabbit control by myxomatosis does not show up in Powell's (1974, Figure 10.2) estimates of disembodied technological change in Australian agriculture; Donald (1982, p.72) reported a benefit to woolgrowers of rabbit control in 1952-53 of \$60 million.

drought years 1965-66 and 1967-68, value added increased at approximately 1 per cent per annum in the period 1950-70, substantially lower than the growth of gross output.

Using Powell's data, the index of output per proprietor was relatively stable during the 1950s and early 1960s but, as a consequence of rapidly rising factor output and falling farm numbers in the later 1960s, this index rose 33 per cent in the 1960s (Figure A.2.1). By contrast, Glau (1972, pp.42-3) presented evidence that real net farm income per proprietor after tax was no higher in 1968-69 than it had been in 1948-49. On Glau's data, and ignoring the early 1950s commodity price boom and the effect of the 1965-66 and 1967-68 droughts, there appears to be a secular downward trend in per capita farm income over this period (Figure A.4.1).⁴¹ The principal differences between Powell and Glau's data are that the latter tends to have higher peaks (e.g. 1951) and lower troughs (e.g. 1949, 1958, 1968). There thus appears to be a downward trend in Glau's series which is not apparent in Powell's.⁴² The reason for the difference between the two data sets appears to be that Glau's was based directly on Australian National Accounts data, whereas Powell's was a significant re-working of this data.

The most recent available data (ABARE 1997, Table 19), presented as indexes for ease of graphing, reveal the following patterns (Figure A.4.2):

- . the nominal *value* of farm production and costs trend at a somewhat similar rate;
- . the *volume* of farm production (i.e. value of farm production deflated by prices received) increased at a slightly faster rate (3.3% p.a.) than the volume of inputs (i.e. value of farm costs deflated by prices paid, 2.2% p.a.).
- . the real value of net farm income (net value of farm production deflated by the Consumer Price Index) was unchanged 1955-70, although there was a noticeable downwards trend from 1965.

The well-known "cost-price" squeeze was strongly evident during 1950-70 (Figure A.4.3). Prices received were unchanged on average over the period, and prices paid increased on average 2.5 per cent p.a. Farmers' "terms of trade" – the ratio of prices received to prices paid – decreased on average 2.5 per cent p.a. over the period 1956-70.

The real value of net farm production deflated by the number of farms,⁴³ was approximately stable over the period 1956-70, although there were large fluctuations in the series. Two troughs in 1965-66 and 1967-68 corresponded to drought over major portions of eastern Australia, and there was a major peak in 1963-64 corresponding to high output prices, and stable input prices and CPI.

Mechanical innovations were particularly important in this period, not simply in terms of the numbers of tractors, but also the increase in tractor size and "quality" in the form of hydraulic controls of trailing implements (Davidson 1992b, p.346).⁴⁴

The declining number of farms in this period reflects Standen and Musgrave's (1972) argument of an agricultural sector which was not experiencing the significant pressures for change arising from

⁴¹ Note Glau's (1972, p.41) reference to a change in "administrative procedures" leading to a significant drop in male "owners" etc.

⁴² Contemporary data series reproduce the Glau result (cf. Figure A.4.2).

⁴³ Caution must be exercised in using farm numbers data as there were intermittent changes to the definition of a "farm" for statistical collection purposes. For example, recorded farm numbers fell 6,000 in 1976-77 and had increased almost back to the 1976-77 level by 1979-80. More dramatically, recorded farm numbers fell from 170,000 to 129,000 from 1985-86 to 1986-87.

⁴⁴ The 1950-70 and 1970-90 periods were also marked by the demise of Australian agricultural machinery companies which, together with many individuals, had been major international inventors of farm machinery in the period 1850-1950.

growth elsewhere in the economy that was being experienced in other developed economies. Further, the relatively smaller role that non-land capital played in Australian agriculture made adjustment easier than when amalgamation required asset redundancy.

Farm investment had been constrained during the 1930s by Depression and, while incomes were more buoyant during the early 1940s, the unavailability of labour, materials and machinery similarly constrained investment. While supplies remained restricted in the immediate post-War period, the non-land capital stock commenced growing in the late 1940s, and grew at 2.5 per cent p.a. during the 1950s and 4.9 per cent p.a. in the 1960s (Figure A.2.6 and Powell 1974). Since output grew at a similar rate (Figure A.2.6), there was little disembodied technological change during these two decades – 0.47 per cent p.a. in the 1950s and 1.10 per cent p.a. in the 1960s (Table A.2.1).

Marketing systems

The ways in which agricultural commodities were traded by the end of the 1960s are summarised in Table A.4.3.⁴⁵ Two commodities, wheat and eggs were traded on both domestic and export markets by SMAs (national or State). Other commodities, such as coarse grains (including barley, oats, sorghum, maize) and oilseeds had some but not all production traded by SMAs on both domestic and export markets. Some fresh fruit and vegetables were domestically traded by SMAs, particularly in Queensland. Sugar, rice, dairy products and dried vine fruit were traded on both markets by private firms, but with considerable public intervention – e.g. backed by compulsory acquisition in the case of sugar and rice. Wholemilk was privately traded on the domestic market, and meat on the export market, but also with public intervention (compulsory acquisition and export licensing respectively). Wool and cotton were privately traded on both markets, and poultry and pigmeat were privately traded on the domestic market.

As well as public intervention in trading activities, other marketing functions were also provided or controlled by the state. Publicly provided services included metropolitan produce markets, regional and metropolitan stock saleyards and abattoirs, and grain handling facilities. Activities controlled by the state included food safety such as meat and dairy inspection, and product quality testing additional to food safety (e.g. nutrient composition in milk) (cf. Hutchinson 1958, Table 30). Controls on the manufacture of table margarine finally collapsed in the 1970s (e.g. Walker and Roberts 1988, pp.126-128).

Trade

Imports of agricultural products comprised a small and declining proportion of total merchandise imports, and a commensurately small proportion of domestic agricultural production and exports (Harris 1967, pp.316-7).

During the 1950s and 1960s, Australian agricultural exports still comprised significant proportions of international trade for some commodities (Harris 1967, Table 16-3). Australian wool comprised 40-50 per cent of world trade. Other commodities where Australian exports were significant included wheat (10-13%), beef and veal (17-19%), mutton and lamb (12-16%), butter (13-14%), processed eggs (13-28%) and dried vine fruits (17%). As in the preceding period, and despite the emergence of a sole wheat exporter and some more successful international commodity price agreements, Australia remained a price taker on world commodity markets despite significant trade shares in some commodities.

The dominance of the UK market as the destination for Australian agricultural exports was maintained in the early post-WW2 period (Davidson 1981, Tables 14-3, 14-4). The UK imported

⁴⁵ State-based marketing schemes varied among the States.

over 80 per cent of Australia's beef and veal, and butter, exports; over 60 per cent of other meats, sugar, fruits and vine fruit, and over 25 per cent of wool, wheat and flour, and non-butter dairy products (Table A.4.1). By the late 1960s, the importance of the UK as a dominant market had fallen substantially, largely in response to British overtures for entry to the European Economic Community (Harris 1967, Table 16-4). By 1973, when Britain entered the EEC, Britain remained a substantial market only for butter and fruits, and small market for meats other than beef and veal, sugar and vine fruit. North America had emerged as a major market for meat, and as an important market for sugar, fruits and vine fruit. Japan had emerged as an important market for wool, some meats, and sugar (Table A.4.1).

The export prices of Australia's agricultural commodities fell sharply from the early 1950s, even ignoring the Korean war commodity price boom. Agricultural commodity export prices broadly plateaued in the 1960s with a minor peak around 1964 (Harris 1982, Figure 19-1).

Despite good international intentions of nurturing world trade in the post-War period, including through the General Agreement on Tariffs and Trade, Australia's export position was hardly improved during the 1950s and 1960s. Significant importing nations sought exemptions from GATT provisions, and the development of the European Economic Community's Common Agricultural Policy encouraged increased domestic production of agricultural commodities (Harris 1967, pp.324-6). Australia entered into bilateral agreements with several countries including, of significance in the long run, voluntary meat import quota arrangements with the USA (Harris 1967, pp.326-7).

Market conditions

By the end of the 1960s, intervention in the marketing of agricultural commodities had achieved its apogee (Table A.4.2), with the exception of the wool reserve price scheme which commenced in 1970 stimulated by the price slump of 1969 (Watson and Parish 1982, p.330). The strains of the system were also beginning to show, with the implementation of wheat quotas in 1969-70 as production continued to respond to pricing signals determined by "cost of production" pricing rather than real market prices.

Effective rates of assistance for agricultural commodities had increased markedly over the period 1948-49 to 1962-63 (Harris 1964 [ratio III] reported in Lewis 1967, p.309). In all cases, however, effective rates had been negative at the beginning of this period, and substantially negative for wheat and barley. Assistance rates were high for butter and sugar (73 and 72 per cent respectively), moderate for dried vine fruit and eggs (40 and 30 per cent respectively), and low for wheat and barley (11 and -2 per cent respectively).

Lewis (1967, p.301) commented:

Indeed it is hardly an exaggeration to say that the history of agricultural price policy in Australia is largely the story of frustrations suffered by primary producers in achieving the necessary conditions for successful price discrimination and of the devices resorted to in order to circumvent or overcome limitations on group or government action towards this end.⁴⁶

Physical infrastructure

During the 1950-70 period there was substantial improvement of the road network as income growth increased car ownership and road freight haulage technology improved. The Federal Government initiated in 1961 grants for the upgrading of the road network in northern Australia to

⁴⁶ Cf. Coper (1978) on some of the frustrations, particularly ones induced by legal judgements, borne farmers and sympathetic governments in the search for successful marketing interventions ("orderly" marketing).

aid the transport of cattle (Hoffman 1967, p.260). The rail network had maximised its reach by about 1941, and nearly 10 per cent of the network had been closed by the 1960s (Hoffman 1967, p.261). Investment in rail still proceeded as the “standard” gauge network was expanded, and resource-specific, often privately-owned, lines were constructed (particularly for mining projects in Western Australia and Queensland) although these projects were of limited if any benefit to agriculture. While overt freight rates generally favoured rail carriage, and road charges were levied on road transport (e.g. Hoffman 1967, p.261), the open access nature of the road resource led to increasing pressure to expand the latter relative to rail.⁴⁷ Extension of facilities for the bulk handling of commodities, particularly wheat and sugar, led to substantial investment in State-wide networks of receipt and storage, and export port facilities (Hoffman 1967, p.262).⁴⁸ Most farms were connected to the electricity grid by 1970 (Davidson 1992b, p.364)

Social infrastructure

The connection of farms to the electricity grid provided improvements in social infrastructure as well as opportunities to improve farm technology. Mains electricity increased access to modern whitegoods and subsequently to television (both local programmes and metropolitan programmes on relay). Governments also committed to increasing educational access, especially at secondary and tertiary level, with major expansion in country high schools and technical colleges; at the end of the 1960s, tertiary education expanded in the form of colleges of advanced education. Health facilities, particularly in major regional centres, were continually upgraded.

Intersectoral linkages

The fixed exchange rates world after Bretton Woods, and a still-Britain-oriented Commonwealth Government after 1949 committed to the “sterling area” concept, had profound implications for macroeconomic management. Both the management of the Australian trade position and minimisation of dollar purchases in the “sterling area” emphasised the importance of maximising Australian exports to achieve the former, and especially exports to Britain to manage the latter. Thus promotion of agricultural production, especially for products consumed in Britain, was not simply a matter of agricultural policy but of national economic policy.

McEwen (1954) issued a statement on behalf of the Australian Agricultural Council⁴⁹ which announced a combined Commonwealth-State focus on agricultural expansion:

The Commonwealth government has decided to adopt as its policy objective a Commonwealth-wide programme of agricultural expansion [for all industries except horticulture; cf. McEwen 1952, p.5], not only to meet direct defence requirements, but also to provide food for the growing population, to maintain our capacity to import, and to make our proper contribution to relieving the dollar problem.

All the resources of Governments and of the primary industries concerned ought to be devoted to an endeavour to exceed these aims, which only represent the first stage of our effort to expand primary production. (McEwen 1954, p.1)⁵⁰

⁴⁷ Constitutional problems of levying State road charges on interstate haulage (cf. Hoffman 1967, p.261) were partially resolved in the 1980s and further addressed following the s.92 *Cole v. Whitfield* case (Inter-State Commission 1990, ch.3). National agreement for uniform regulation was reached in 1991 (National Competition Council 1998, p.115).

⁴⁸ The charging system for access to the wheat bulk handling system, and its implicit subsidy of more-distant growers became a major policy debate in the 1970-90 period.

⁴⁹ One of the earliest Ministerial Councils (cf. Godden 1997, pp.88,113-5).

⁵⁰ Proving the political innovativeness of agriculture, McEwen (1954, p.5, emphasis added) noted, with respect to the announced production aims, that “Commonwealth and State Governments have recognized these defined levels of production as *bench marks* on which to base their policies.”

Achievement of the announced production aims was predicated on:

- . availability of inputs such as machinery, materials, fertilisers and labour;
- . stabilised (including “guaranteed minimum prices to producers”) and increased product prices;
- . expanded extension services, facilitated by Commonwealth grants to the States;
- . direct financial assistance for the dairy and tobacco industries; and
- . “special taxation depreciation allowances for primary producers.” (McEwen 1952, pp.8-9)

Rapid expansion of the world economy in the 1950s, and the post-War reconstruction of Japan and its emergence as a major manufacturing economy, supported the demand for raw materials. Japan became a major customer for Australian agricultural commodities just as the UK began to orient itself economically to Europe in the 1960s. Thus markets fortuitously became available for the expanded agricultural production stimulated by a production-oriented policy. Equally fortuitously, Australian agriculture avoided the substantial pressures for adjustment that emerged in other developed economies despite agricultural expansion. In an economy regulated by tariffs on manufactured imports and wage fixing, the economic circle was completed by support for agriculture – “protection all round” – by which the Country Party’s justified agricultural support.⁵¹ However, major mineral and energy discoveries in the 1950s and 1960s, and the commitment to their exploitation, sowed the seeds of heightened intersectoral competition which subsequently led to increasing pressures for national economic adjustment, including agricultural adjustment.

The vision thing

The period 1950-70 was one of great optimism in Australia generally, and within agriculture. The period opened propitiously as Australia was relatively lightly affected by war, and it benefited greatly from the buoyant market conditions for agricultural commodities during post-War reconstruction. This general optimism was reflected in Australia’s determination to maintain a high rate of European immigration and to undertake the grandiose Snowy Mountains Scheme partly to absorb this workforce. Agricultural optimism was rewarded quickly by the Korean war wool boom and the innovation of rabbit control by the successful spread of myxomatosis (Donald 1982, p.72). These events sustained agricultural dreams through the slowly increasing difficulties of later years. Rapid developments in chemical and mechanical technology sustained a belief that technology would relax all production constraints, especially in agriculture.

The (conservative) political stability of most of the period was accompanied by substantial aggregate economic growth and moderate growth rates of per capita income, and low interest rates and inflation rates.⁵² The Federal Government committed to education by funding Universities directly and increasing scholarship funding to improve equity of access, and by commencing funding of state schools via s.96 grants. The Federal Government confidently rejected the modest recommendations of the Vernon Committee for indicative planning.

Increasingly through the period there were social experiments throughout the Western World supported by economic growth and, in Australia’s case, by post-War immigration. Despite its conservative nature, Australian agriculture supported an expansionist vision, reflected in continuing irrigation and land development visions (substantially by public investment) and rapid increases in private non-land capital (cf. Figure A.2.1). For example, the myth still persists about the

⁵¹ Lloyd (1982, pp.358-9) noted that “protection all round” had been coined by Country Party leader E.C.G. Page in the early 1920s.

⁵² Aggregate real GDP grew 4.4% p.a. and 5.3% p.a. in the periods 1953-54 to 1959-60 and 1959-60 to 1969-70 respectively. Real GDP per head of population grew 2.1% p.a. and 3.3% p.a. in the corresponding periods (ABARE 1997 for population data and Reserve Bank of Australia 1982 Table 5.2 for real GDP). Rates of growth in the CPI generally ranged 2-3% p.a. except for the early and mid-1950s; nominal interest rates on 10 year Commonwealth Government bonds were 3-5% p.a. for the 1950s and 1960s (RBA 1982, Tables 5.16a and 2.27 respectively).

importance of the Snowys, not just as a national symbol but as representative of good economic policy making:

The growing electorate of senior citizens looks back 50 years along a seemingly neglected national pathway. It was marked clearly at the beginning by the monumental Snowy Mountains Scheme, at a point of decisiveness about our national future, development planning and the carving of our destiny symbolised by generating power and irrigating the plains, as we turned our rivers from east to west. (Campbell 1998)⁵³

Economists (and occasional others) were spectres at the feast, doubting the wisdom of large-scale public investment in physical infrastructure (land clearing and irrigation), and questioning the shibboleth of orderly marketing. The expansion of tertiary education during the period ironically permitted the increasing employment of such irritants (especially at Armidale, Melbourne, Perth and Sydney). Davidson (1965) rejected the economic desirability of the accelerated development of northern Australia. Lloyd (1972, pp.144-5) had argued:

Until recent decades decisions on government-financed development schemes, such as irrigation projects and the opening up of new areas, were made largely on the basis of technical factors, flavoured by amateur economics (as propounded by engineers, accountants, and agricultural scientists) and a leavening of parish pump politics (many a dam is a memorial to a swinging seat of the past).⁵⁴

The implicit suggestion that an alternative view was preferable went largely unheeded.

A.5 1970-1999: on the slippery slope

Natural resource base

Over much of NSW, the period 1900-50 was one of below-average rainfall, whereas that of 1950-80 was one of generally above-average rainfall (Figure A.1.1). It is possible that, from about 1980, the area began moving into another period of below-average rainfall which – if it eventuates – would have major implications for the medium-term profitability of agriculture.

The 1960s closed with a public debate about the economic value of irrigation in Australia, and 21,900 gigalitres of irrigation storage capacity (e.g. Davidson 1969). Given this background, expansion of irrigation resources might have been expected during the period, but at a diminished rate as the proportion of regulated streams rose, and as the overall profitability of schemes was increasingly used as a criterion in the decision process and the economic viability of schemes was increasingly constrained by commodity prices (cf. Campbell and Dumsday 1990, p.168). However, in the 1970-90s Australia almost doubled its irrigation storage capacity to 41,800 gigalitres. Thirty

⁵³ Lloyd's (1972, p.143) comment on the debate over northern development is also apposite here:

“Some newspaper reviewers have reacted to the difficulties raised by Davidson [in *The Northern Myth*] by regarding them as a challenge which Australians must take up to prove their national virility. Phrases like ‘having a go’ and ‘recapturing the pioneering spirit’ are employed in support of what might be termed a policy of economic masochism. Part of the political appeal of northern development, in a nation of city-dwellers, doubtless lies in the pleasures of vicarious pioneering.”

⁵⁴ Only a few years after Lloyd's article first appeared, the present author (as a new graduate economist) was told by government economists who had undertaken benefit-cost analyses of irrigation projects that they were required to re-do their analyses until the right answers were obtained (i.e. benefit-cost ratios exceeded 1.0).

per cent of this increased capacity was in the Ord Scheme alone (5,797 gigalitres);^{55,56} 1,440 gigalitres were in Queensland's Fairbairn dam; 1,364 gigalitres in NSW's Copeton dam;⁵⁷ 4,000 gigalitres in Victoria's Dartmouth dam; 1,122 gigalitres in Victoria's Thomson dam; and 1,860 gigalitres in Queensland's Burdekin dam (Crabb 1997).⁵⁸

Large scale land clearing for agriculture was still occurring into the 1990s; anon (1996, Table 6.1) reported Queensland as clearing 3,000 square kilometres on average 1983-93 and 4,500 in 1990 whereas NSW cleared 1,500 square kilometres on average 1983-93 and 1,500 in 1990. Queensland and NSW undertook 90 per cent of the estimated Australian clearing in 1990. Subsequent Queensland estimates were an estimated rate of land clearing in 1991-95 of 262,000 hectares per annum, an estimated decline of 21 per cent compared to 1988-91. More than half the clearing (53 per cent) was occurring on brigalow lands; approximately 55 percent of all clearing was on leasehold land,⁵⁹ and 42 per cent on freehold. There may be a high regrowth rate, as high as 43 per cent of the clearing rate, although there is considerable uncertainty about this estimate (Resource Sciences Centre 1997).

Despite the long-standing interest in soil conservation at the state level (see section A.3), more general concerns surfaced in the 1970s that all was not well with Australia's environmental capital stock. Individuals had lobbied strenuously for decades over relatively local environmental issues (especially national parks – e.g. Thompson 1986; Libby 1998) and the first major environmental battles were fought over non-agricultural issues – such as the Tasmanian hydro schemes involving Lake Pedder (circa 1970) and the Gordon-below-Franklin (early 1980s).⁶⁰ By the late 1980s, an increasingly unpopular Federal Labor Government had resorted to courting the “green” vote to retain office at the 1990 election (cf. Godden 1997, pp.133-4).

A wider range of environmental issues was also perceived as impinging upon agriculture. Recognition of soil degradation extended beyond soil erosion to issues such as dryland salinity, acidity, soil structure and organic matter content. By the 1980s there was increasing national government involvement in environmental issues such as the National Soil Conservation program. There was a remarkable alliance of the National Farmers' Federation and the Australian Conservation Foundation to seek government support for the financing of environmental preservation and restoration works, particularly on farm lands. The 1990s were declared the Decade of Landcare (ABS 1996a, pp.170-1; 1996b, pp.138-41). The extensive regulation of most southern rivers and recognition of externalities such as salinity slowly began to change the emphasis from expanding irrigation schemes to making more efficient use of existing harvested water.⁶¹

⁵⁵ The cost of the Ord in contemporary dollars is almost astronomical. In 1996-97 dollars and ignoring the effects of discounting (compounding forward in this case), the public cost to 1990-91 of the Ord scheme in dams and channels alone is \$1,889 million. Using conventional compounding criteria to express the Ord costs at real discount rates of 2, 4 or 6 per cent p.a. respectively, the present value cost of the Ord in 1996-97 dollars is \$3,385 million, \$6,035 million or \$10,703 million respectively. Gross farm income from this scheme in the mid-1990s was approximately \$50 million p.a. (<http://www.kimberley.wa.gov.au/ord2.html>).

⁵⁶ Building on Davidson's *The Northern Myth*, Whitaker (1979) detailed the failure of the Ord to the late 1970s, including the disastrous losing battle with insects. Expanding on a much earlier argument of Griffith Taylor, Whitaker (1979, p.65) asserted that “‘Agricultural development of the tropical north-west should be tackled later – much later (if at all!)’”. In early 1998, the WA and Northern Territory Governments selected a consortium to develop Stage 2 of the Ord Scheme, to add an additional 43,000 hectares of irrigated land (cf. <http://www.kimberley.wa.gov.au/ord2.html> or <http://www.drd.wa.gov.au/punder.htm>). The latest saviour of irrigation in the north, including the proposed Fitzroy scheme (cf. <http://www.drd.wa.gov.au/punder.htm>), is Bt cotton which, it is confidently believed, will relax the pest constraint.

⁵⁷ In its 20 year lifetime, Copeton has rarely been full.

⁵⁸ Major dams were also completed for non-irrigation purposes, including Queensland's Wivenhoe dam (1150 gigalitres) and 18,000 gigalitres in Tasmania for hydroelectricity of which 11,300 gigalitres were in the Lake Gordon storage (Crabb 1997).

⁵⁹ This may have been a condition of lease.

⁶⁰ But cf. the comment above on the successful campaign to thwart the Little Desert scheme in Victoria.

⁶¹ But grand irrigation visions still remain – cf. the Watering Australia Foundation.

Climate change emerged as an issue, with agriculture identified both as a source of greenhouse gas emissions (especially methane and nitrogen oxide) and also as a potential casualty of changed environmental conditions.

This interest led to a flood of analysis of and enquiries into environmental matters. By the mid-1990s, therefore, there was substantial documentation – but essentially in a “snapshot” form – of the “state of the environment” (e.g. anon 1996, NSW Environment Protection Authority 1997, and reports of the Murray-Darling Basin Commission and the Ecologically Sustainable Development process). Thus, for example, ABS (1996a, chapter 1) briefly discussed water stocks and a variety of contaminants (e.g. salinity, nutrients, agricultural chemicals, blue-green algae); soils and problems (e.g. erosion, acidity, and salinity); environmental hazards (e.g. cyclones, floods, bushfires, droughts and pestilence). More detailed snapshots of problems with soils, exotic flora and fauna, pollutants were documented in ABS (1996a, sections 6.7, 9.3, 12.1). ABS (1996a, Tables 13.1.1 13.3.2) documented extensive contemporary Federal, State and Territory legislation that affects environmental resources and schemes to manage environmental resources.

ABS (1996b) summarised and extended in some key areas the environmental information in ABS (1996a). ABS (1996b, Figures 2.8 and 2.9) compared the likely vegetation cover in 1788 and the 1980s, showing the contraction of forest to woodland particularly on the eastern seaboard, and the replacement of forest, woodland and shrubland by pasture and cropping in the south east, South Australia, and the eastern seaboard (cf. Barr and Cary 1992, chs.3-4 and especially plates I-V). Maps illustrated areas – of most interest in the major agricultural zones – which were susceptible to water and wind erosion, and affected by soil structure decline (extensive in all the cropping areas), soil acidification (extensive in southern and western cropping areas), soil salinity (extensive in the Western Australian wheat belt, and more patchy in the cropping and high rainfall areas of south and eastern Australia), and “woody weed” encroachment (extensive in the semi-arid pastoral areas) (ABS 1996b, chapter 6; see also Industry Commission 1997, chapter 3, Gretton and Salma 1996, Appendix C).

As noted previously, Gretton and Salma (1996, Appendix C) reviewed mid-twentieth century NSW surveys of land degradation. Gretton and Salma reported a subsequent 1987-88 survey which extended the types of land degradation considered and showed approximately 10 per cent of NSW was experiencing soil acidity problems, soil structure decline (18 per cent), scalding (10 per cent), moderate or worse sheet erosion (3 per cent), moderate or worse gully erosion (21 per cent), moderate or worse wind erosion (25 per cent), slope slippage (3 per cent). Unfortunately, the later study was reported on a NSW-wide basis, preventing comparisons with the earlier more limited studies (cf. Section A.4).⁶²

The drawing down of groundwater in the Great Artesian Basin prompted an investment commitment by the Federal Government to increase the efficiency of water use by capping bores and piping bore drains (Vaile 1998a). The economics are interesting since the Basin involves considerable externalities – i.e. overdrawing of water reduces water pressure and increases recovery costs, and may even terminate supply. However, the water supply is not a public good since the water is both rival and excludable; potentially it is a club good where there are both local clubs and, ultimately, a club for the Basin itself. The externality problem does not necessarily require government investment but investment by the beneficiaries who are readily identifiable and small in number, although government intervention may be useful for developing an appropriate process to derive a solution.

In its 1992 Mabo judgement, the High Court declared that the common law recognised the existence of native title, and granted a small area of land in the Torres Strait to the claimants. There was a

⁶² cf. Davidson (1992b, pp.361-3).

national epidemic of political apoplexy in early 1993 as its implications⁶³ dawned on conservative politicians (cf. Godden 1997). The case directly affected Crown land, as the Court held that sovereignty gave the Crown only “radical” title to land, but not beneficial ownership; the principal areas of unalienated land where indigenous people maintained a “continuing and traditional” association was in Western Australia (some 40 per cent of the State). The Commonwealth Native Title Act was passed in late 1993 and was intended to provide an expedited administrative process by which native title could be claimed. Although the Wik peoples had lodged a claim for native title over pastoral leasehold land in mid-1993, the High Court gave its judgement late in 1996. By recognising that pastoral leasehold did not necessarily extinguish native title, this case provoked another storm of protest (cf. Godden 1998, 1999).⁶⁴ This case primarily affected States with pastoral leasehold (i.e. WA, SA, Queensland and NSW) plus the Northern Territory. After Wik, the same cries for extinguishment of native title were heard as after Mabo – generally with less venom but with greater effect, since many of those most vehemently and publicly opposed to Mabo in 1993 had transited to Federal government in 1996. In 1998, the Federal Court granted native title rights over the sea and sea-bed in terms similar to the rights granted by the High Court in Wik (Box A.5.1).⁶⁵ A recent Federal Court determination concerning native title over about 8,000 square kilometres in the Kimberley has evoked new expressions of outrage (Box A.5.2).⁶⁶

Farm production

Aggregate performance in the agricultural sector for 1970-97 is graphed in Figures A.4.2-A.4.3 and may be summarised as follows:

- . the volume of farm production (nominal value deflated by prices received) increased at a faster rate (2.5% p.a.) than the volume of farm costs (nominal value deflated by prices paid);
- . the real net value of farm production (nominal value deflated by the CPI) was highly volatile, with major peaks and troughs deriving from combinations of seasonal conditions and (export) prices, but the trend in the real net value of farm production was inexorably downwards;
- . the downwards trend in the real net value of farm production *per farm* was not as severe as that for the real net value of farm production, reflecting adjustment in the farm sector.⁶⁷

ABARE’s farm surveys reflect, for a sample of farms, detailed performance measures within a year and comparable time series for farm types and size classes. Farm performance may be summarised using farm business profit⁶⁸ (in 1997-98 dollars):

- . broadacre cropping industry values averaged around zero 1977-78 to 1997-98 with a substantial peak in the mid-1990s (ABARE 1998, Figure B);
- . mixed livestock-crops industry values averaged around zero, with a substantial fall in the early 1990s (ABARE 1998, Figure C);

⁶³ i.e. that the law recognised that indigenous Australians might still retain property rights deriving from those possessed by their forebears when British sovereignty was declared.

⁶⁴ For example, from late 1998, “The decision that the judge made goes well beyond the Mabo decision made in 1992, and one would not have thought that that would have been possible with the devastation and the potential that that had for political and economic disruption to what was previously seen as always being a politically stable country.” (Lightfoot 1998, p.P944).

⁶⁵ In December 1998, the application of the Yorta Yorta people claiming native title rights over freshwaters (of the Murray River) failed in the Federal Court.

⁶⁶ Senator Lightfoot (Liberal, WA) denounced “the insanity of Justice Lee’s decision” (Lightfoot 1998, p.P944).

⁶⁷ Acknowledging that revisions in the definition of a “farm” in the mid-1970s and mid-1980s substantially reduced the number of farms recorded which may have biased upwards the series “real net value of farm production *per farm*”.

⁶⁸ = total cash receipts – total cash costs + changes in trading stock – depreciation – imputed labour costs

. sheep industry values averaged around zero to 1990, with negative values during the 1990s reflecting the collapse of the Reserve Price Scheme and the failure to liquidate the stockpile (ABARE 1998, Figure D);⁶⁹

. beef industry (excluding major feedlots) values trended downwards over the period, and were negative after 1980 (ABARE 1998, Figure E);

. sheep-beef industry values averaged around zero to about 1990, and negative thereafter (ABARE 1998, Figure G); and

. dairy industry values were on a slowly rising trend, with negative values in the 1980s and largely positive values in the 1990s (ABARE 1998, Figure H).

In all the preceding industries, returns were also strongly related to farm size in the 1997-98 year. “Large” farms (gross returns exceeding \$200,000) had positive farm business profit and rates of return on equity above 3 per cent p.a. “Small” farms (gross returns under \$100,000) had negative farm business profit for all industries. “Intermediate” farms had positive farm business profit for broadacre cropping and mixed livestock-crops, and negative values for the other industries. Even in those industries where farm business profit was negative for the intermediate group, the top 25 per cent of farms in this group had positive farm business profits with return on equity around 3 per cent p.a. (ABARE 1998, Tables 18-23).⁷⁰

Australian agriculture is dominated by large farms. Wheat and mixed livestock-cropping industries had about one-third of farmers in small, intermediate and large categories; but large farms produced about 60 per cent of the gross value of production. In the sheep, beef and sheep-beef industries, small farms comprised 49-70 per cent of producers; large farms (15-18 per cent of farmers) produced 47-54 per cent of the gross value of production. The dairy industry was even more dominated by large farms (43 per cent of farm numbers), producing 70 per cent of industry gross value of production (ABARE 1998, Tables 18-23).

The composition of the farm workforce changed substantially over this period. Between 1968 and 1988, the ratio of full-time to part-time workers fell from 9.3 to 3.8. The percentage of women in the full-time farm workforce rose from 10 to 17 per cent. The percentage of women in the part-time farm workforce rose from 66 to 75 per cent (Lewis 1990, Table 14.5). In 1993-94, 20 per cent of farm women worked on-farm more than half the year, and a further 20 per cent worked for more than one-third of the year on-farm. Ten per cent of women worked off-farm for more than half the year; most men worked full-time on-farm (Goody 1995, p.17).

Marketing systems

As outlined in section A.4, the 1970-90 period began with extensive government (Commonwealth, State or local) ownership or direction of economic activity in post-farm gate marketing (apart from general infrastructure used by agriculture such as roads, railways and ports). Such activities included extensive trading in agricultural commodities, or extensive control of such trade where it was not undertaken publicly. Additionally, other marketing functions such as facilities provision (livestock selling and slaughtering, produce markets) and regulation of food safety and composition were also undertaken publicly. The Reserve Price Scheme for wool in 1970 added another great industry in which there was significant public trading activity.

⁶⁹ Apart from the unliquidated one million bales in the official stockpile at the end of 1998, there was reported to be a similar quantity in private hands.

⁷⁰ McColl et al (1997, Table 3.3) reported similar results on average for the period 1985-86 to 1995-96 although, in this case, the return to equity figure includes capital appreciation.

While the peak of government intervention in marketing systems was achieved at the outset of the period, the 1970s-90s were characterised by the dismantling or collapse of extensive intervention in marketing. Creation of the Industries Assistance Commission in 1974, and its adoption of an “economic rationalist” agenda, led to the continual questioning of public intervention in marketing systems as well as other interventions. Reports of the IAC into wheat led to the gradual deregulation of the domestic wheat trading in the 1980s, although the AWB remained the sole exporter. The Wheat Board also acquired the powers to purchase wheat (rather than simply pool) and to trade in other commodities. The egg industry was privatised in the 1980s. Commercial pressures led to the effective deregulation of the domestic sugar market. The period started with the creation of wool’s Reserve Price Scheme in 1970, but the scheme collapsed in 1991, although the stockpile is still being painfully dissipated.⁷¹ Many of the small marketing boards in Queensland disappeared in the 1980s. Wholemilk trade has recently been deregulated. Continuing pressure is being placed on marketing systems intervention through the National Competition Policy process.

Some marketing functions other than trading were added to the public sector, such as objective testing services for wool, although this service was later privatised. Local government run abattoirs were largely bankrupted during the period, and there has been pressure to privatise metropolitan fruit and vegetable produce markets. Grain handling facilities, where previously public, have also been privatised. Having been promised before 1910, a national approach to food safety management was instituted in the 1990s with the National Food Authority (later Australia and New Zealand Food Authority) (Godden 1997). As part of the contemporary deregulatory approach to government activity many food safety functions are being devolved back to industry.

Trade

Australian imports of agricultural products remained a small proportion of imports and exports during the 1970s-80s (Harris 1982, pp.384-5; 1990, p.343). Australia’s share of the international wool trade rose substantially to average 65 per cent in the mid 1970s⁷² and 66 per cent for the second half of the 1980s. Comparable shares for other commodities were wheat and flour (10%), beef and veal (29%), mutton and lamb (18%), butter (6%), sugar (9%) and dried vine fruits (10%). Compared to the previous decade, the first three were stable, butter and dried vine fruit were substantially down, and sugar was slightly up (Harris 1982, Table 19-3; 1990, Table 21.3).

The pattern of Australian export destinations in the mid-1970s and late 1980s also changed compared to the previous decade. The importance of Western Europe (UK plus EEC-6) as a market for most Australian agricultural commodities declined substantially. This market remained significant in the 1970s and 1980s only for wool (30% of exports in both decades) and fruits (40%, 34% including vegetables, respectively) and even fruit exports had declined by 20 percentage points between the 1960s and 1970s. By the late 1970s, the USA emerged as a major market for beef and veal (57%; 60% for the late 1980s) and sugar (36%, n.a.). Japan maintained its previous level of wool exports (32%, falling to 19% in the late 1980s), and substantially increased its imports of meat other than beef and veal (36%, 30%), sugar (32%, n.a.), dairy other than butter (22%, 15%) and grains other than wheat (48%, 29%). Japan emerged by the late 1980s as a major beef and veal export market (27%). ASEAN countries had been major markets for non-butter dairy products from the 1960s, and emerged as major butter markets in the late 1980s. Australia’s major markets for wheat, butter, and other dairy products were outside these markets (86%, 79% and 75% respectively for the 1970s). The Middle East took about one-quarter of Australian exports of wheat, other grains, meats other than beef and veal, and dairy products (Harris 1982, Table 19-4; 1990, Table 21.4). The growing importance of Japan, ASEAN countries and the USA as export markets

⁷¹ The Federal Government is still responding to the wool stockpile legacy by proposing to commercialise the disposal of the stockpile and have another enquiry into wool promotion (Vaile 1998b,c respectively).

⁷² Harris (1990, Table 21.3 gives this as 58.5% for the three years ending 1978.

(and sources of Australian imports) reflect the reorientation of Australia's trade with "Pacific Rim" countries in the second half of the century.

Up to the late 1980s, former communist bloc countries had become substantial importers of Australian wool (approximately 30 per cent of exports). Internal turmoil in China in 1988 led to substantial reductions in its imports of Australian wool from 1988-89. The difficult economic transformation undertaken by the former Soviet Union and Eastern European countries beginning in the mid-1980s substantially reduced those countries' imports of Australian wool from 1990-91. These events contributed significantly to pressures on the wool Reserve Price Scheme in 1990 that led to its ultimate collapse in 1991.⁷³

Attempts to remove or even limit distortions to international trade that breached at least the spirit of the GATT were unsuccessful in the Kennedy round. Accession of the UK to the EEC simply exacerbated the problem (Harris 1982, p.393). Harris (1982, p.399) noted, however, that without the forum provided by the GATT "agricultural protection might have been more extensive." In the mid-1980s, and as a response to the failure of previous attempts to liberalise world agricultural trade, the Cairns Group of Fair Traders was established with Australia as a principal sponsor and participant. The objective of the Cairns Group was to argue for agricultural trade reform in the Uruguay Round of GATT which was concluded in 1994. Anderson (1998, p.3) argued that only "a little more than a standstill" in national protection of agricultural industries was achieved. The principal features of the agricultural agreement were reductions in farm export subsidies, increases in import market access (including conversion of some non-tariff barriers to tariffs), and reductions in producer subsidies. The sanitary (human and other animal) and phytosanitary (plant) agreement sought to limit the use of quarantine-related measures to real health issues.⁷⁴ Anderson argued that the ensuring liberalisation of trade was not great and that in some cases there are considerable opportunities to maintain (or even increase) effective agricultural protection.

Market conditions

Like the preceding period, 1970-99 was characterised by declining aggregate farmer terms of trade⁷⁵ (Figure A.4.3). Since the potential for industry expansion depends primarily on the profitability of export markets, Figure A.4.5 illustrates indexes of "real" export prices (except for wool and beef which are the auction prices⁷⁶) relative to domestic prices paid by farmers.⁷⁷ There are two interesting features of these series. First, there were highly price volatile commodities – sugar, wheat and wool, and soybeans in the early part of the period. In these commodities, production expansion was subject to a higher degree of price risk than the other commodities. Second there are some commodities for which the real export price declined relatively little over the 1970-99 period – especially cheese and to a lesser extent wool, coarse grains, cotton and wheat. Output expansion in these commodities was less susceptible to declining profitability.

The 1970-99 period opened at the high point of government intervention with the addition of the wool Reserve Price Scheme to the extensive marketing intervention already in place (Table A.5.2). The creation of the Industries Assistance Commission in 1974 began a process of increasing the transparency and consistency of evaluating government economic intervention, including in agricultural marketing. The IAC had little immediate effect on modifying the forms and degree of marketing intervention but, in the 1980s, began to achieve limited success in persuading

⁷³ And whose consequences linger on in the form of the wool stockpile – recent media release from Vaile?

⁷⁴ Not all "exotic" disease outbreaks occur through introductions. The 1998 outbreak of Newcastle disease in poultry in Sydney and Rylstone apparently resulted from the mutation of a local "benign" form of the virus (Nowak 1998).

⁷⁵ ratio of prices paid to prices received; the significance of this series depends upon the appropriate quality correction of the prices paid and prices received series, especially the former.

⁷⁶ And therefore contaminated by the effects of the Reserve Price Scheme.

⁷⁷ The ideal series would be export prices relative to domestic prices paid for each industry, but relevant prices paid series were unavailable.

government to reduce the degree of protection provided.⁷⁸ The domestic market for wheat (including grain transport and handling) was deregulated by the end of the 1980s; the wool Reserve Price Scheme collapsed under the weight of the accumulated stockpile in 1991; and the sugar industry was deregulated in the mid-1990s. Deregulation of the dairy industry commenced slowly. The effect of continuing government pressure on marketing (and other forms of) intervention is demonstrated by the reductions in the effective rates of assistance for agricultural industries during the 1970s and the relatively low but highly variable rates thereafter (cf. Godden 1997, Reassessment of government intervention in marketing is continuing under the National Competition Policy banner.⁷⁹

Physical infrastructure

The 1970-90 period commenced with a long-serving Coalition Government in which rural interests had a major voice, but was quickly followed by the (short-lived) Labor Government which was determined to shift resources to urban areas (particularly for services like sewage). In the ensuing years, there was increasing competition for infrastructure investment between urban and rural areas. Considerable resources were invested in some rural infrastructure, particularly air transport and national highways. However, the decreasing relative importance of the farming economy and overcapitalisation of some rural infrastructure (e.g. railways track capacity – Honu, Shaw and Taplin 1990, p.150) led to disinvestment in some infrastructure. Additionally, falling local government rates made it increasingly difficult for local government to maintain local road infrastructure. With increasing demands on publicly-provided capital, the efficiency of rural infrastructure – including efficient pricing – became of greater importance to government than simple provision (Honu, Shaw and Taplin 1990). The efficiency emphasis increased with the development of National Competition Policy principles in the 1990s.

*Social infrastructure*⁸⁰

In the last part of the century, there has been increasing focus on the difficulties of providing social infrastructure in the bush.⁸¹ The view has arisen that there are two Australias – metropolitan Australia which has a high level of services, and rural and regional Australia which is poorly provided with such services. Several comments may usefully be made about this proposition. Firstly, to the extent that it is true, this is not a new phenomenon. As the Rural Reconstruction Commission outlined, especially in its seventh report, non-metropolitan areas have historically been relatively poorly provided with these services. And there are good economic reasons for this state of affairs – the services that are well-provided in the cities are well provided because these services are usually characterised by substantial economies of size and scope. Conversely, it is difficult to provide such services in smaller population centres because of corresponding diseconomies (cf. Godden 1997, ch.11).

⁷⁸ In part, the failure of government to reduce agricultural protection may have resulted from a realisation that such reductions would have been bitterly opposed since, until the 1980s at least, little success had been achieved in reducing rates of protection in key non-agricultural industries (especially TCF industries and motor vehicles).

⁷⁹ cf. Industry Commission (1998).

⁸⁰ cf. Davidson (1992b, pp.363-5).

⁸¹ e.g. McGinness (1996, p.201) argued that “There is a perception that those who live in rural and remote areas have inadequate or inequitable access to social services which the majority of Australians take for granted” without specifying whether or not this “perception” is valid. A typical example of this hysteria concerns recent reports of heroin deaths in country NSW (e.g. Jopson 1999 and other stories in the same edition). Twenty per cent of heroin deaths 1992-96 were reported to be in non-metropolitan NSW. But, because 62% of NSW’s population lives in Sydney, this means that the Sydney death rate (per head of population) is 2.6 *times* that of country NSW. With respect to social policy, even otherwise ill-informed critics have noted that “Despite this caveat, the fact remains that Australian governments always have gone a long way towards treating their rural citizens in an equitable manner” (Sher and Sher 1994, p.19). Interestingly, the Shers’ general argument has been picked up by One Nation (cf. its “National Rural and Regional Policy” released 29 September 1998, <http://www.onenation.com.au/policy/rural.html>)

Secondly, while rural and regional Australia might not have immediate access to the range and quality of services available in metropolitan Australia, these areas generally have vastly better access to good quality social services than they did, say, at the time of the Rural Reconstruction Commission's report. In part these changes have occurred because of dramatic improvements in transport and communications (improved motor vehicles and substantial investment in road infrastructure, and improved telecommunications; cf. Davidson 1992b, pp.363-5). Additionally, State and Federal Governments have invested substantial resources in non-metropolitan areas, particularly in regional areas. Regional cities now have, for example, high quality secondary and often tertiary education facilities. Many regional centres now also have high quality medical services providing, for example, surgical facilities that were unavailable anywhere at the time of the Rural Reconstruction Commission's report, or were only available in metropolitan areas. Further, governments (supported by the private sector in some cases) have extended the services originally provided by the Flying Doctor Service to outback Australia to air ambulance services for closer-in areas (including helicopter medical retrieval services for emergencies). Because of the investment of medical services in the larger regional centres, air ambulance services are increasingly focusing transfers within country areas, rather than primarily being a country-city link as in earlier years. Thus, while *rural* Australia – i.e. areas outside the regional centres – may be finding it increasingly difficult to attract *local* medical services, high quality medical services are much closer than they used to be because they are located in regional centres rather than simply the metropolis. This has substantially improved the quality of life of rural Australians because the cost obtaining these services, and the cost of supporting those using these services, has been substantially reduced. The extension of mains electricity – even where wildly uneconomic⁸² – throughout rural and regional Australia, and reticulated water and sewerage especially in regional Australia, have provided services similar to metropolitan Australia. Even Telstra's much-maligned telephone service is vastly better than it was in 1970.⁸³

Thirdly, the quality of some services – those for which rural and regional Australia are well-endowed – are substantially higher than in metropolitan Australia. For example, air and water quality are often higher outside the metropolis. Intra-urban transport is generally of a substantially higher quality in regional Australia than in metropolitan Australia. Even the quality of non-freeway highways in regional Australia is, in many instances, as good as the best (non-freeway) metropolitan roads. On a per kilometre travelled basis, many two-lane country main roads are substantially superior to comparable metropolitan roads. Thus, where pecuniary incomes are similar across metropolitan and non-metropolitan Australia – especially the public service – real incomes *in comparable occupations* are likely to be substantially higher in non-metropolitan Australia because of higher quality of environmental services, and substantially lower land values for housing.

Fourthly, the lowest levels of services in rural and regional Australia are generally found in remote areas, and are particularly concentrated in indigenous communities (e.g. Godden 1997, §10.1).

Thus, rather than the politically-simplistic “two Australias” concept, it is more reasonable to conclude that there are at least *five* Australias: metropolitan Australia (and even that might be subdivided by average income), regional Australia, rural Australia, remote non-indigenous Australia, and remote indigenous Australia.

Intersectoral linkages

By the beginning of the 1970s, rural opinion makers and politicians had become wedded to the concept of “protection all round”. During the 1970s, there was a vigorous debate amongst

⁸² In some instances it probably would have been cheaper to provide diesel generators and fuel and/or solar power systems rather than extend the electricity grid.

⁸³ A simple example is the replacement of operator-connected long-distance calls with STD and ISD services.

(agricultural) economists as to the best policy to minimise the effects of tariffs on the agricultural sector. Harris et al. 1974 (Green Paper) canvassed the idea of tariff compensation, which was subsequently debated vigorously leading to a general acceptance that – even in the short term – the optimal policy was tariff reduction rather than tariff compensation. Meanwhile, in the real economy, the Whitlam Labor Government had attempted a “big bang” solution to protection reduction with a 25 per cent tariff cut in 1973. This approach backfired and effective rates of assistance to manufacturing industry at best stabilised during the years of the Fraser Coalition Government and actually increased in the last years of that Government (cf. Godden 1997, Figure 13.4). By the beginning of the 1980s, the National Farmers’ Federation rejected the “protection all round” approach to tariffs, and was converted to the path of reduction tariffs and other assistance (NFF 1981, p.x).

While the importance of tariff reduction was palpable, agricultural economists were riveted by Gregory’s (1976) analysis of the potential implications for agriculture of the link between the exchange rate and then-rapid growth in the mining sector and mineral exports. Gregory’s partial equilibrium analysis was rapidly converted in general equilibrium terms and its conclusions shown to be robust (e.g. Higgs 1986, chapter 7, especially Table 7.9). Mineral growth was thus shown to eliminate the final prop for agriculture’s avoiding major structural change. A falling exchange rate would conspire with declining world commodity prices – the latter particularly as stimulated by high protection in the Northern Hemisphere developed countries (European Community, USA and Japan) – to intensify the cost-price squeeze on Australian farming (cf. Standen and Musgrave 1972).⁸⁴

The Fraser Government initiated an enquiry into the financial system (Campbell Committee)⁸⁵ which reported in 1981. Deposit interest rate ceilings were deregulated in 1980 and restrictions on overseas investment removed in mid-1981 (Industry Commission 1991a, Appendix E). Exchange rate pressures following the change of federal government in 1983 initiated an evolutionary deregulation of the Australian financial system (e.g. Industry Commission 1991a, Appendix E).

In 1992 an enquiry was commissioned by the Keating Government, with the agreement of the States and Territories, into competition policy. The principles underlying this enquiry were the prevention of “anti-competitive conduct against the public interest”; “universal [sic] and uniformly applied rules of market conduct” irrespective of business ownership; an “appropriate transparent assessment process” to investigate potential net public benefit of anti-competitive conduct; and to develop open, integrated domestic markets for both goods and services by eliminating barriers and reducing red tape (Hilmer et al. 1993, p.361). King (1997, p.271) noted that the major recommendations of the enquiry were accepted by the Council of Australian Governments (COAG) in 1994, and a Competition Principles Agreement to implement these recommendations was signed in 1995. The COAG also signed a Conduct Code Agreement and an Agreement to Implement National Competition Policy and Related Reforms. The latter was reinforced by Commonwealth financial rewards to the States for progress on implementing competition policy. The Federal Parliament enacted the *Competition Policy Reform Act 1995*, and all States passed legislation required under the Conduct Code Agreement (cf. Godden 1997, pp.375-381).

The implementation of National Competition Policy principles could affect agriculture in two broad ways. Firstly, where there was significant government assistance to agriculture – e.g. in the provision of subsidised services such as irrigation water, or through intervention to restrict competition in the sale of agricultural commodities such as statutory marketing arrangements – competition policy principles may require reduction or elimination of these benefits. Secondly, implementation of National Competition Policy principles in the wider economy – e.g. in the State-

⁸⁴ cf. the opposite tendency (but under a fixed exchange rate) at the beginning of the century with the decline in mineral production (Figure A.1.3).

⁸⁵ The Campbell Committee was, in the long run, more successful in inducing reform than the much more public concurrent (?) enquiry, the Royal Commission into the ships painters and dockers union.

regulated industries of electricity, gas, water and transport targeted for reform under the Agreement to Implement National Competition Policy and Related Reforms – may improve the profitability of agriculture by reducing the costs of agricultural production or marketing. The ultimate effects of these changes on farm households is indeterminate, however, since the costs of some (particularly retail) services provided to farms might increase.⁸⁶

The potential impact of National Competition Policy reforms was investigated by the Industry Commission (1995) using computable general equilibrium modelling. For individual agricultural industries, results were presented in terms of implications for industry output (Table A.5.1). The output effects of National Competition Policy reforms were estimated to be generally favourable (or, at worst, neutral) for agriculture – with the major exception of dairying, where reform of the national dairy arrangements would substantially reduce output. The effect of National Competition Policy reforms on *net farm income* cannot be derived from this analysis, because farm income also depends on the price effects of these output changes (or any other changes), and any effects on changes in costs. However, at least where price effects are small, and farm costs are high relative to turnover, the effects of quite small output changes might be dramatic in income terms.⁸⁷

The National Competition Policy reforms are, however, not necessarily secure. Elements of the National Party are not necessarily convinced that these reforms should be implemented in a thorough-going way (cf. Godden 1997, p.381) and the One Nation Party proposes to abolish National Competition Policy.⁸⁸

The vision thing – more circuses, less bread

The 1970-1999 period opened confidently in Australia, with widely-shared optimism that post-War economic growth would continue, and that the social liberalism which had developed in Western countries generally during the 1960s would also continue to flourish.⁸⁹ This social confidence was reflected in the election of the Whitlam Labor Government in 1972 which – irrespective of its subsequent shortcomings in government – seemed to embody the times.⁹⁰ Economic optimism was shattered by the economic disruption which followed the oil price shocks of the 1970s and the consequences of the US government's financing of the Vietnam War. That war also fractured political and social cohesion which, in the Australian context, coalesced with the fierce political acrimony that grew as the Labor Government stumbled to dismissal.

The diminution of certainty in the 1970s accelerated in the 1980s as old truths crumbled under the goad of a more integrated global economy. Deregulation commenced in the financial sector, enriching new winners and embittering new losers. The iron pyrites entrepreneurs of the late 1980s

⁸⁶ cf. Industry Commission (1998) for a summary of two and a half decades of microeconomic reform in Australia.

⁸⁷ For example, if turnover is 100 and costs are 90 providing net income of 10, a 10 per cent increase in output with no effects on output prices or costs *doubles* net income. For most exported commodities, quantity changes are unlikely to affect price.

⁸⁸ "One Nation will abolish the National Competition Policy, as it is damaging and destructive to small rural business and local government. (Pauline Hanson's One Nation, National Rural and Regional Policy, Released 29th September 1998) [<http://www.gwb.com.au/onenation/policy/rural.html> on 15 November 1998].

⁸⁹ Of course there were pockets of economic and social deprivation that should not be glossed over. In agriculture there had been recent short run crises associated with drought (e.g. 1965-66 and 1967-68) and commodity prices (e.g. wool 1969 and beef 1975) and the policy-induced wheat quotas of 1969-70. There were also chronic problems associated with structural change in agriculture with associated poverty for both owner-operators on the margin and rural employees, and for Aborigines (cf. Henderson 1976).

⁹⁰ Conservative politicians never accepted the legitimacy of this government – and, with the benefit of hindsight, would no doubt argue they were correct in doing so. The then Country Party contained the "hard" men – Anthony, Hunt, Nixon and Sinclair – who relentlessly pursued the Labor Government. Ironically, although Labor is known for never forgetting an enemy – particularly from within its own ranks! – conservative politicians continue to reject the legitimacy and achievements of the Whitlam Labor Government (e.g. "Only on rare occasions when self interest is seen as directly and outrageously challenged (notably the Whitlam era)..."; Greiner (1990, p.22). Even the more recent and deliberately antagonistic Keating is less reviled having been defeated in 1996.

embodied a new religion of short run gain which gained wider community currency. The integrated computer and communications revolution drove an emphasis on globalisation while simultaneously diminishing individual vision to two-dimensional television and commercial rather than tribal icons (e.g. sport).

It would be nice to think that, by the end of the twentieth century, there would no longer be the need to make symbolic sacrifices of the nation's scarce resources. But the search for tangible symbols of the nation's identity goes on. Big dams are still built (Burdekin) or proposed (Fitzroy in north-west Western Australia, integrated proposals of the Watering Australia Foundation), as well as other big schemes (Parkes International Freight Airport). Even if – perhaps “because” – the need to ensure food supplies has been obviated, the need for circuses has increased; the circuses are now more characteristic of the non-agricultural sector, although they may also affect agriculture.⁹¹

Apart from tangible symbols, the predominant contemporary vision is about means/process rather than ends/objectives. At the beginning of the 1990s, a NSW Premier confidently announced the end of ideology:

It is apparent, in the wake of recent events in Europe, that the world is entering a postideological age.

... Australia, too is showing greater than usual intolerance for ideologies such as socialism, libertarianism and states' rights. (Greiner 1990, p.2)

Greiner argued that the principal objective of government was to efficiently deliver services to the community – neatly sidestepping arguments as to *which* services should be delivered which is the stuff of ideology. By avoiding arguments about ideology, Greiner's ringing declaration simply disguised the new dogma of “efficiency” with its implied utilitarian ideology. It is not surprising that “economic rationalism” would be challenged by the political left (at least while occupying the Opposition benches). But the near-right also challenges “economic rationalism” because this programme ignores the collateral damage of structural change, particularly in rural areas. The (newly) marginalised fought back in 1997-98 under the banner of the One Nation Party – successfully in the 1998 Queensland election and less successfully in the following national election.⁹²

Some of Hugh Mackay's recent media essays, based on his analysis of focus groups, suggest that some voters – especially marginalised voters who support One Nation – are simply lashing out at politicians, and latching on to the nearest “anti-politician” politician in sight. On this analysis, the potential One Nation voters are simply lodging a protest vote – it doesn't matter for whom they vote as long as it's not one of the established parties.

Alternatively, if One Nation voters are rationally signalling a rejection of the policies of “economic rationalism” and economists believe these policies are appropriate, then the *latters'* failures may partly explain the rise of One Nation. These failures might include (a) failure to adequately explain the benefits of economic reform and (b) failure to ensure that adjustment costs or detrimental distributional effects are adequately addressed in economic reform. On the former, *public* economists have become rather evangelical, expecting acolytes to follow blindly where the true

⁹¹ Sydney Olympics, Federal and Northern Territory Parliament Houses, two railway lines from Darwin, car and motorbike grand prix.

⁹² The end of certainty prompted the rise of those who purport to offer new visions to replace the lost truths. The mid-1990s populism of One Nation reflects the loss of vision for other than efficiency objectives, and the hard times of an increasingly large marginalised group in both metropolitan and regional/rural Australia. That the verities offered hark back to an impossible-to-revisit past is irrelevant. In this way, at least, John Howard's harking back to the verities of the 1950s both in his “headland” speeches prior to the 1996 election and in the early days of his premiership helped prepare the way for One Nation.

believers lead. On the latter, economic policy making is not simply about static or long run efficiency. Economists ignore adjustment costs at the peril of those they advise and those affected by this advice. Further, economists can also advise on least-cost mechanisms to cope with detrimental effects of economic reform policies for particular individuals or groups.

A.6 Fin de siècle—II

Looking forward into the twenty-first century is no easier than it was looking forward into the twentieth. In the late nineteenth century, a former head of the US Patent Office is reported to have said that everything that could usefully be invented had been. But Australian farmers at the end of the nineteenth century had probably never seen a steam traction engine, and internal combustion engine tractors were yet to be invented. These farmers had probably never seen, let alone used, an internal combustion engine. They would not have sown wheats bred for Australian conditions. Powered flight occurred after the turn of the century. Apart from electric light, which few farmers would have seen, there were no electric household appliances. If they contracted tetanus from a scratch, pneumonia from a cold, or bubonic plague from a rat off a visiting ship, they would probably die. With these caveats, therefore, it is possible to identify the forces that might affect agriculture *early* in the twenty-first century without attempting to predict future progress.

In the twentieth century, agriculture became increasingly integrated with the rest of the economy as services previously supplied on-farm (e.g. animal power, weed control) were increasingly supplied by off-farm firms (tractor suppliers and chemical companies respectively). Agriculture forms a smaller proportion of aggregate economic activity – although absolute growth in farm output continues as technological change improves farm production efficiency – as the demand for non-farm commodities grows with per capita income growth. As its relative size diminishes, agriculture's capacity to affect the aggregate economy has also diminished and, together with population decline in rural areas, its ability to directly influence the political process has also commensurately shrunk. Without a dramatic increase in demand for Australian agricultural commodities, these trends appear irreversible.

With respect to natural resources. The principles underlying the El Niño/Southern Oscillation *climate* phenomenon having been discovered, Australian farmers are now in a slightly better position to understand short-run (7-10 year) rainfall cycles in eastern Australia. If nothing else, Australian farmers understand that the drought never ends: they are either recovering from the last, or entering the next. Short-run prediction now seems possible: e.g. by early autumn rainfall characteristics for the following winter-spring may be predictable (e.g. the La Niña of 1998). Continued developments in the understanding of ENSO, and perhaps its longer-term links with the deep ocean conveyor and circum-Antarctic currents, may improve the prospects for understanding, and predicting, weather patterns – although achieving this goal may be confounded with global climate change. Regarding other natural resources like *land*, an understanding of land degradation processes like salinity and soil acidification may prevent further degradation, but it may never be profitable to reverse existing degradation. Without dramatic improvements in technology, the costs of the treatment process may never offset the value of production benefits with positive discount rates. Where there are externalities like dryland salinity, the best long-term prospect for amelioration may lie in continued growth in farm size which internalises the externality because of the probable difficulties of maintaining community action like Landcare into the long term. Externalities associated with coastal acid sulphate soils clearly need to be addressed in the very short run. With regard to *water*, efficient use of stored water in the Great Artesian Basin and in riparian storage requires, for the former, assessment of the net benefits of investment in better management and, in the case of the latter, improved water markets perhaps integrating resource and externality into a single or related markets. Conflicts between water used for commodity production compared to urban use and environmental flows is likely to intensify. Further, in the case of riparian water, the creation of efficient markets in *stored* water itself – not just in the

delivery of stored water – is necessary so that sensible decisions can be made about future investment in the maintenance or replacement of storage capital. With regard to *scourges* (pests, diseases and weeds), the Australian environment will be continually challenged by geographical expansion of existing scourges (e.g. cane toads) and by the development of resistance to biological control vectors (e.g. rabbit calicivirus) or chemical control (e.g. weeds). Further, the Australian environment will also be continually challenged by new introductions, since quarantine cannot intercept every possible deleterious organism.

With respect to technology. The implement size revolution, which has enabled continual substitution of capital for labour on cropping farms appears to have run its course with no major developments in tractor size in the last decade. In part this barrier has been determined by soil compaction from increasingly large machinery. Further capital-labour substitution may involve reduction in size of computer-controlled machinery and implements where a single operator may control large numbers of machines, possibly differentially applying inputs (e.g. fertiliser, weed control) depending on very local environmental conditions. The revolution in molecular biology (“genetic engineering”) promises future practical advantages for farmers, from improved scourge control (e.g. Bt cotton, herbicide resistant cultivars), to cultivars more rapidly available from increased efficiency of the breeding process, to new cultivars producing entirely new products (e.g. plants or animals producing pharmaceutical products rather than conventional food and fibre products). Continual efforts to reduce the size of the public sector (irrespective of market failure arguments justifying government intervention) and new technologies (especially in molecular biology and computer technologies) being increasingly embodied in physical inputs with more effective property rights is continually changing the balance between public and private endeavour in developing new agricultural technologies.

With respect to farm organisation. Farm organisation remains something of an enigma. Where capital costs are high (including where there are significant economies of size) or where risks are high (especially production risk), corporate organisation may have advantages in organising capital or managing risk across a portfolio of agricultural and non-agricultural assets. However, where economies of size are not substantial, where individuals perceive major non-pecuniary benefits from farming, or where family farming offers labour flexibility or willingness to accept low implicit wage rates, family farming (albeit in a private company form rather than traditional sole proprietorships or partnerships) may remain a superior alternative to company farming. Where family farming remains, structures such as sharefarming will continue to provide flexibility in farming operations. Share farming will also continue as a means of capital accumulation for some new entrants. Continued dominance of private over corporate ownership means that lending rather than equity would remain an important source of capital.

With respect to markets. Distinctions between industries producing domestically-consumed commodities and export-oriented industries are becoming of less importance as trade barriers continue to fall. Both types of industry are likely to produce with less government assistance in the form of import barriers or export assistance. Ultimately, the Federal government may be forced to privatise the AWB – irrespective of growers’ wishes – and end the export monopoly. Indirect or direct controls on meat and dairy exports, for example, may also similarly end. The fate of both export and import competing industries will thus almost entirely depend on their ability to compete on price with international producers. This ability to compete does not solely depend on these industries’ intrinsic characteristics, but also on external factors such as exchange rates. Continuation of the long-run cost-price squeeze – properly accounting for changes in the quality of inputs – will depend largely on excess demand for Australian agricultural commodities. Determining factors include the translation of continued world population growth into effective demand for global food production (increasing world food prices generally) or demand for Australian food production specifically; and world income growth increasing the demand for the agricultural commodities produced in Australia.

New commodities, particularly the future products of genetic engineering, may prove significant. However, the slow development of the oilseeds industry over the past three decades, and the difficulty of effectively establishing grain legume and pulse industries in many parts of Australia, demonstrate the high costs of establishing new markets. Establishment of downstream processing industries in Australia (domestic “value adding”) will depend on the profitability of these activities in competition with international firms; the prognosis is not good. Indeed, domestic “value adding” may be more successful *without* domestic processing (e.g. supply of fresh produce to markets like Japan).

Electronic commerce is not a new phenomenon, but has affected agricultural commerce since the development of trans-oceanic cables, telephone, wireless and fax. The Internet has simply intensified the electronic trend by further reducing – where the infrastructure is suitable – the costs of market communication and widening the range of feasible electronic marketing activities. As technology costs continue to fall, market participation costs will also continue to fall. However, where commodities are non-standardised, or where the reputation of buyer or seller are key components of the contract, prospects for electronic commerce will be limited.

References

Anderson, K. (1998), "Agriculture and the WTO into the 21st century", *Policy Discussion Paper* No. 98/03, Centre for International Economic Studies, University of Adelaide, October.

Anon. (1996), *Australia: State of the Environment 1996*, State of the Environment Advisory Council, CSIRO Publishing, Melbourne.

Australian Bureau of Agricultural and Resource Economics (1997), *Australian Commodity Statistics*, Commonwealth of Australia, Canberra.

Australian Bureau of Agricultural and Resource Economics (1998), *Australian Farm Surveys Report 1998*, Commonwealth of Australia, Canberra.

Australian Bureau of Statistics (1996a), *Australians and the Environment*, Catalogue No. 4601.0, Commonwealth of Australia, Canberra.

Australian Bureau of Statistics (1996b), *Australian Agriculture and the Environment*, Catalogue No. 4606.0, Commonwealth of Australia, Canberra.

Barnard, A. (ed.) (1962), *The Simple Fleece: studies in the Australian wool industry*, Melbourne University Press.

Barr, N. and Cary, J. (1992), *Greening a Brown Land: the Australian search for sustainable land use*, Macmillan Education Australia, Melbourne.

Ben Ward & Ors v State of Western Australia & Ors [1998] 1478 Federal Court of Australia (24 November 1998) [http://www.austlii.edu.au/au/cases/cth/federal_ct/1998/1478.html] [internet version of 26 November 1998.]

Bolton, G.C. (1992), *Spoils and spoilers : a history of Australians shaping their environment*, second edition, Allen & Unwin, North Sydney

Butlin, N.G. (1962a), *Australian Domestic Product, Investment and Foreign Borrowing 1861-1938/39*, Cambridge University Press.

Butlin, N.G. (1962a), Distribution of the Sheep Population: preliminary statistical picture, 1860-1957, chapter ## in Barnard (1962).

Butlin, N.G. (1971), *Investment in Australian Economic Development 1861-1900*, Australian National University, Canberra.

Cain, N. (1970), Trade and Economic Structure at the Periphery: the Australian balance of payments, 1890-1965, chapter 2 in C. Forster (ed.) *Australian Economic Development in the Twentieth Century*, George Allen & Unwin, London.

Campbell, K.O. (1980), *Australian Agriculture: reconciling change and tradition*, Longman Cheshire, Melbourne.

Campbell, K.O. (1982), Land Policy, chapter 11 in Williams (1982).

Campbell, K.O. and Dumsday, R.G. (1990), Land Policy, chapter 11 in Williams (1990)

- Campbell, D. (1998), "Time to plan for when our number's up", *The Australian* 21 October, p.13.
- Coper, M. (1978), "Constitutional obstacles to organised marketing in Australia", *Review of Marketing and Agricultural Economics* 46(2), August, 71-102.
- Coper, M. (1987), *Encounters with the Australian Constitution*, CCH Australia, North Ryde, N.S.W.
- Coper, M. (1992),
- Crabb, P. (1997), *Impacts of anthropogenic activities, water use and consumption on water resources and flooding*, Australia: State of the Environment Technical Paper Series (Inland Waters), Department of the Environment, Canberra.
- Davidson, B.R. (1969), *Australia Wet or Dry: the physical and economic limits to the expansion of irrigation*, Melbourne University Press.
- Davidson, B.R. (1981), *European Farming in Australia: an economic history of Australian farming*, Elsevier Scientific, Amsterdam.
- Davidson, B.R. (1990a), "Rum Corps to IXL: services to pastoralists and farmers in NSW", *Review of Marketing and Agricultural Economics* 58(2,3), 158-77.
- Davidson, B.R. (1992a), "Rum Corps to IXL: services to pastoralists and farmers in NSW", *Review of Marketing and Agricultural Economics* 60(3), 313-332.
- Davidson, B.R. (1992b), "Rum Corps to IXL: services to pastoralists and farmers in NSW", *Review of Marketing and Agricultural Economics* 60(3), 333-367.
- Donald, C.M. (1982), Innovation in Australian Agriculture, chapter 3 in Williams (1982).
- Drynan, R.G. (1986), "Wheat: Australia's hidden mineral export – a comment", *Journal of the Australian Institute of Agricultural Science* 52(3), 149-53.
- Dwyer, J. (1998), *Flanders in Australia: a personal history of wool and war*, Kangaroo Press, Sydney.
- Gale, S.J., Haworth, R.J. and Pisanu, P.C., 1995, The 210Pb chronology of late Holocene deposition in an eastern Australian lake basin, *Quaternary Science Reviews*, 14, 395-408.
- Glau, T.E. (1972), The Cost-Price Squeeze on Australian Farm Income, chapter 2 in Throsby (1972).
- Gooday, J. (1995), *Women on Farms: a survey of women on Australian broadacre and dairy family farms, 1993-94*, Research Report 95.10, Australian Bureau of Agricultural and Resource Economics, Canberra.
- Gregory, R.G. (1976), "Some implications of growth in the mining sector", *Australian Journal of Agricultural Economics* 20(2), 71-91.
- Greiner, N. (1990), Australian Liberalism in a Post-Ideological Age, the 1990 Alfred Deakin Lecture, University of Melbourne, 3 December, roneo.

- Gretton, P. and Salma, U. (1996), *Land Degradation and the Australian Agricultural Industry*, Staff Information Paper, Industry Commission, Canberra, June.
- Harris, S.F. (1967), Agricultural Trade and Trade Policy, chapter 16 in Williams (1967).
- Harris, S.F. (1982), Agricultural Trade and its International Trade Policy Context, chapter 19 in Williams (1982).
- Harris, S. (1990), Agricultural Trade and Agricultural Trade Policy, chapter 21 in Williams (1990).
- Harris, S. et al. (1974), Green Paper
- Hassall and Associates, and Coffey MPW (1993), *The Ord River Irrigation Project: past, present and future: an economic evaluation, Stage 1*, Prepared for Kimberley Water Resources Development Office, August.
- Higgs, P.J. (1986), *Adaptation and Survival in Australian Agriculture*, Oxford University Press, Melbourne.
- Hilmer et al. 1993,
- Hoffman, E.S. (1967), Agricultural Development Projects, chapter 12 in Williams (1967).
- Honu, B., Shaw, A.J. and Taplin, J.H.E. (1990), Transport, chapter 10 in Williams (1990).
- Hutchinson, R.C. (1958), *Food for the People of Australia*, Angus and Robertson, Sydney.
- Industry Commission (1991a), *Availability of Capital*, Draft Report, Canberra.
- Industry Commission (1991b), *Statutory Marketing Arrangements for Primary Products*, Report No, 10, Australian Government Publishing Service, Canberra.
- Industry Commission (1997), *A Full Repairing Lease: inquiry into ecologically sustainable land management*, Draft Report, Canberra, September.
- Industry Commission (1998), *Microeconomic Reforms in Australia: a compendium from the 1970s to 1997*, Research Paper, Canberra, January.
- Inter-State Commission (1990), *Road Use Charges and Vehicle Registration: a national scheme, Volume 1*, Australian Government Publishing Service, Canberra, March.
- Jopson, D. (1999), "Heroin blights the bush", *Sydney Morning Herald* 11 January, p.1 (and related stories on p.4 and subsequently on 12 January).
- Lewis, J.N. (1967), Agricultural Price Policies, chapter 15 in Williams (1967).
- Lewis, P. (1990), Rural Population and Workforce, chapter 14 in Williams (1990).
- Libby, R. (1998), *Defending the Little Desert: the rise of ecological consciousness in Australia*, Melbourne University Press.
- Lightfoot, P.R. (1998), Native Title: Miriuwong and Gajerrong Decision, *Hansard* (Proof), Senate, 7 December, P944-5.

- Lloyd, A.G. (1972), *The Controversy on Northern Development*, chapter 9 in Throsby (1972).
- McColl, J.C., Donald, R. and Shearer, C. (1997), *Rural Adjustment: managing change*, Mid-term Review of the Rural Adjustment Scheme, Department of Primary Industries and Energy, Canberra, May.
- Mary Yarmirr & Ors v The Northern Territory of Australia & Ors* (1998a) 771 Federal Court of Australia (6 July 1998a) [internet version of 6 July 1998.]
http://www.austlii.edu.au/au/cases/cth/federal_ct/1998/771.html
- Mary Yarmirr & Ors v Northern Territory of Australia & Ors* [1998b] 1185 Federal Court of Australia (4 September 1998) [internet version of 26 November 1998]
[\[http://www.austlii.edu.au/au/cases/cth/federal_ct/1998/1185.html\]](http://www.austlii.edu.au/au/cases/cth/federal_ct/1998/1185.html)
- Mauldon, R.G., (1990), *Price Policy*, chapter 19 in Williams (1990).
- Moore, R.M. (1962), *Effects of the Sheep Industry on Australian Vegetation*, chapter 13 in Barnard (1962).
- National Competition Council (1998), *Compendium of National Competition Policy Agreements*, Second Edition, Canberra, June.
- National Farmers' Federation (1981), *Farm Focus: the 80s*, Canberra.
- NSW Environment Protection Authority (1997), *NSW State of the Environment 1997*, Sydney.
- Nowak, R. (1998), "Genesis of killer", *New Scientist* 160(2163), 5 December, p.24.
- Powell, J.M. (1976), *Environmental Management in Australia, 1788-1914 – guardians, improvers and profit: and introductory survey*, Oxford University Press, Melbourne.
- Powell, R.A. (1974), *Technological Change in Australian Agriculture 1920-21 to 1969-70*, unpublished PhD thesis, University of New England, Armidale.
- Queensland Department of Primary Industries (n.d.), *Australian Rainman*, Version 2.2, [Brisbane].
- Reeve, I.J. (1988), *A Squandered Land: 200 years of land degradation in Australia*, Rural Development Centre, University of New England, Armidale.
- Reserve Bank of Australia (1982), *Australian Economic Statistics 1949-50 to 1980-81: I Tables*, Occasional Paper No. 8A, [Sydney], May.
- Resource Sciences Centre (1997), *SLATS: the Statewide Landcover and Trees Study*, Interim Report, , Queensland Department of Natural Resources, [Brisbane], October
[\[http://www.dnr.qld.gov.au/slats\]](http://www.dnr.qld.gov.au/slats).
- Reynolds, H. (1992), *The Law of the Land*, second edition, Penguin, Ringwood.
- Rolls, E. (1996), *Citizens*, University of Queensland Press, St Lucia.
- Rosen, S. (1998), *The Improvers' Legacy*, chapter 1 in J. Powell (ed.), *The Improvers' Legacy: environmental studies of the Hawkesbury*, Deerubbin Press, Berowra Heights.

- Rural Reconstruction Commission (1944a), *A General Rural Survey*, First Report, 17 January, [Canberra].
- Rural Reconstruction Commission (1944b), *Settlement and Employment of Returned Men on the Land*, Second Report, 18 January [Canberra].
- Rural Reconstruction Commission (1944c), *Land Utilization and Farm Settlement*, Third Report, 30 June [Canberra].
- Rural Reconstruction Commission (1944d), *Financial and Economic Reconstruction of Farms*, Fourth Report, 28 August [Canberra].
- Rural Reconstruction Commission (1945a), *Rural Credit*, Fifth Report, 28 February [Canberra].
- Rural Reconstruction Commission (1945b), *Farming Efficiency and Costs and Factors Relating Thereto*, Sixth Report, 11 April [Canberra].
- Rural Reconstruction Commission (1945c), *Rural Amenities*, Seventh Report, 18 May [Canberra].
- Rural Reconstruction Commission (1945d), *Irrigation, Water Conservation and Land Drainage*, Eighth Report, 11 December [Canberra].
- Rural Reconstruction Commission (1946), *Commercial Policy in Relation to Agriculture*, Tenth Report, 7 August [Canberra].
- Sher, J.P. and Sher, K.R. (1994), "Beyond the conventional wisdom: rural development as if Australia's rural people and communities really mattered", *Journal of Research in Rural Education* 10(1), Spring, 2-43.
- Standen, B.J. and Musgrave, W.F. (1972), Agricultural Adjustment in Australia, chapter 4 in Throsby (1972).
- Symons, M. (1982), *One Continuous Picnic: a history of eating in Australia*, Duck Press, Adelaide.
- Thompson, P. (ed.) (1986), *Myles Dunphy: Selected writings*, Ballagirin, Sydney.
- Throsby, C.D. (1972), *Agricultural Policy: selected readings*, Penguin, Harmondsworth.
- Vaile, M. (1998a), Saving the Great Artesian Basin, Media Release, DAFF98/7V, Minister for Agriculture, Fisheries & Forestry, 20 November [Canberra]
[<http://www.daff.gov.au/daff/pr/releases/vaile>].
- Vaile, M. (1998b), NFF Address Outlines Ministerial Agenda, Media Release DAFF98/9V, Minister for Agriculture, Fisheries & Forestry, 25 November [Canberra]
[<http://www.daff.gov.au/daff/pr/releases/vaile>].
- Vaile, M. (1998c), Response To AWRAP 'No Confidence' Motion, Media Release DAFF98/12V, Minister for Agriculture, Fisheries & Forestry, 1 December [Canberra]
[<http://www.daff.gov.au/daff/pr/releases/vaile>].
- Walker, R. and Roberts, D. (1988), *From Scarcity to Surfeit: a history of food and nutrition in New South Wales*, New South Wales University Press, Sydney.

Wheelhouse, F. (1972), *Digging Stick to Rotary Hoe: men and machines in rural Australia*, Rigby, Adelaide.

Whitaker, C. (1979), "The Ord River Irrigation Area: a geographer's view of fanciful reveries and stark realities in the tropical North West of Australia", *Proceedings of the Royal Geographical Society of Australasia. South Australian Branch*, 80, 45-69.

Williams, D.B. (ed.) (1967), *Agriculture in the Australian Economy*, Sydney University Press.

Williams, D.B. (ed.) (1982), *Agriculture in the Australian Economy*, second edition , Sydney University Press.

Williams, D.B. (ed.) (1990), *Agriculture in the Australian Economy*, third edition , Sydney University Press.

Table A.1.1: Analytical Approach

Themes	Issues
Natural resource base (land, water)	Climate, land base, water Property rights – non-market values Resource degradation – gross (erosion, salinity); new technologies (acidification), ferals (flora & fauna)
Farm production	Production Technology Input prices (relative, effects on farms) Structure of farming Services to agriculture (public, private)
Marketing – systems & government intervention (food safety cf. distributive)	Private domestic activities Public intervention (facilities, infrastructure, profit support, food safety)
Trade	Private trade activities Public intervention Trade policy
Market conditions – aggregate demand, aggregate supply & prices	Prices – secular trends Domestic v. export oriented products
General physical infrastructure	Transport & communications Actual/perceived economies of scale – public natural monopoly
Social infrastructure	Health, education, social security (disaster relief)
Intersectoral linkages	Mining Manufacturing industry protection & deregulation
The vision thing	Socialist/welfareist Xenophobia or Xena-phobia Grandiose visions

Table A.1.2: Average Decade Growth Rates in Deflated Value Added, Primary Sectors (% p.a.)

	Pastoral	Agriculture	Dairy, forestry, fishing
1861-70	13.0	4.1	3.2
1870-80	5.1	6.7	8.6
1880-90	3.1	1.6	1.7
1890-1900	-5.1	3.3	4.6
1900-10	12.3	3.8	-1.9
1910-20	-5.8	-3.4	2.6
1920-30	5.8	4.1	6.6
1930-39	0.9	-1.7	3.1

Source: calculated as geometric means of growth rates from Butlin (1962a, Table 269)

Table A.2.1: Estimates of Technological Change in Australian Agriculture, 1920-21 to 1969-70

	Basic estimate
1920-21 to 1929-30	-2.72
1929-30 to 1939-40	3.96
1939-40 to 1949-50	0.47
1949-50 to 1959-60	0.47
1959-60 to 1969-70	1.10
1920-21 to 1969-70	0.78
1920-23 to 1958-61	0.66

Source: Powell (1974)

Table A.2.2: Agricultural Price Programmes, 1900-30*

	1	2	3	4	5	6	7	8	9	10	11
1. Supply management											
(i) supply level											
input restrictions											
import restrictions					E						
marketing quotas											
(ii) supply diversion											
time (buffer stock)											
place (HCP)			X		X				X		
purpose (price discrim.)					X						
type of consumer											
export licensing			X						X		
acquisition					X						
2 Demand influences											
Mixing regulations or induced purchase by tariff											
restriction of substitutes											
public consumption											
export contracts-bilateral											
3. Direct price augmentation											
buffer fund											
deficiency payment											
flat rate subsidy					X						

After Lewis (1967, Table 15-1) and Mauldon (1990) Rural Reconstruction Commission (1946, Appendix 1)

1: wheat; 2: wholemilk; 3: butter/cheese/processed milk; 4: beef; 5: sugar; 6: cotton; 7: tobacco; 8: rice; 9: raisins/sultans/currants; 10: eggs; 11: peanuts

also arrangements for canned fruit, wine (Rural Reconstruction Commission 1946, pp.248-9,

Notes: * excluding wartime measures (cf. Rural Reconstruction Commission 1946, Appendix 1)

Table A.2.3: Proportion of Australian Agricultural Exported (average 1936/37 to 1938/39) (% of commodity's production)

Commodity	Export (%)
Wool	91.7
Wheat	65.1
Butter	49.2
Cheese	46.9
Beef and veal	20.8
Mutton and lamb	27.9
Pigmeat	16.9
All carcase meat	22.8
Canned meat	42.9
Apples and pears	39.7
Canned fruits	53.3
Dried vine fruit	78.1
Wine	21.1
Sugar	52.8

Source: Rural Reconstruction Commission (1946, p.37).

Table A.2.4: Australian Agricultural Commodities, Exports to United Kingdom (1926/27 – 1938/30) (range, % of commodity's exports)

Commodity	1926/27-1929/30	1930/31-1938/39	Average 1936/37 to 1938/39
Wool	29.5 – 33.1	31.4 – 43.6	
Wheat	21.4 – 40.8	32.2 – 56.6	
Butter	82.7 – 85.8	89.7 – 94.5	93
Cheese	89.7 – 96.4	92.7 – 96.9	96
Beef and veal	50.0 – 57.7	64.9 – 92.7	92 (beef)
Mutton and lamb	87.3 – 94.2	93.0 – 98.1	94 (M), 99 (L)
Pigmeat	00.0 – 30.6	75.4 – 94.0	93
All carcase meat	61.8 – 73.6	76.8 – 94.6	
Canned meat	41.2 – 65.7	48.9 – 78.6	
Apples and pears	54.9 – 80.3	77.3 – 88.8	82 (A), 94 (P)
Canned fruits	47.2 – 82.6	66.6 – 88.9	85
Dried vine fruit	78.2 – 88.7	56.1 – 75.3	66
Wine	92.2 – 96.9	92.4 – 96.1	95
Sugar	48.0 – 95.9	73.3 – 96.8	86
All commodities	36.2 – 44.5	44.4 – 55.9	

Source: Rural Reconstruction Commission (1946, pp.38-9, para.2281).

Table A.3.1: Agricultural Price Programmes, 1930-50*

	1	2	3	4	5	6	7	8	9	10	11
1. Supply management						?		?			
(i) supply level											
input restrictions											
import restrictions					E						
marketing quotas											
(ii) supply diversion											
time (buffer stock)											
place (HCP)	X		X		X				X		
purpose (price discrim.)		X			X						
type of consumer											
export licensing			X	X					X		
acquisition	X ^a	X			X						
2 Demand influences											
Mixing regulations or induced purchase by tariff											
restriction of substitutes											
public consumption											
export contracts-bilateral											
3. Direct price augmentation											
buffer fund											
deficiency payment	X										
flat rate subsidy	X										
tax	X										

After Lewis (1967, Table 15-1) and Mauldon (1990); Rural Reconstruction Commission (1946, Appendix 1)

1: wheat; 2: wholemilk; 3: butter/cheese/processed milk; 4: beef (& sheepmeat); 5: sugar; 6: cotton; 7: tobacco; 8: rice; 9: raisins/sultanas/currants; 10: eggs; 11: peanuts

also Commonwealth arrangements for canned fruits, wine, apples and pears, (Rural Reconstruction Commission 1946, pp.248-9); State arrangements for eggs, wine grapes, ginger, milk (NSW), onions, chicory, maize, eggs, milk (Vic), arrowroot, maize, barley, broom millet, butter, cheese, cotton, eggs, fruit, honey, pigs, peanuts, sugar, wheat, ginger, milk (Qld), eggs (SA), eggs, onions, milk (WA), fruit (Tas.)

Notes: * ignores special WW2 arrangements (for which see Rural Reconstruction Commission (1946, Appendix 1)

E – import embargo

a. under external affairs power (International Wheat Agreement 1933)

? State schemes (Queensland and NSW respectively)

Table A.4.1: Destination of Australian agricultural exports

Percent by value export to	3 years ended	Wool %	Wheat & flour %	Beef & veal %	Other meats %	Sugar %	Butter %	Other dairy %	Fruits %	Vines %
UK	1949	31	27	81	78	65	89	37	62	72
	1967	12	9	25	51	42	69	15	56	54
	1973	5	12	12	24	20	42	5	47	17
EEC	1949	37	3	0	1	1	0	3	0	0
	1967	28	0	3	6	0	0	2	11	0
	1973	26	1	1	3	1	0	0	11	0
Canada & USA	1949	18	0	0	0	6	1	0	17	10
	1967	8	0	61	18	26	0	3	18	22
	1973	2	0	66	21	32	3	3	19	38
Japan	1949	1	1	2	1	1	0	2	1	1
	1967	32	7	2	3	24	3	12	0	0
	1973	40	13	13	26	28	5	18	4	2
All other countries	1949	13	69	17	20	27	10	58	20	17
	1967	20	84	9	22	8	28	68	15	24
	1973	27	74	8	26	19	50	74	19	43

Source: Davidson (1981, Table 17-2)

Table A.4.2: Agricultural Price Programmes, 1950-70 (1966 for Lewis (1967))

	1	2	3	4	5	6	7	8	9	10	11
1. Supply management											
(i) supply level											
input restrictions					L			L/W	W		
import restrictions	T		T		Q	T	T	T	T	T	T
marketing quotas		X			X		X				
(ii) supply diversion											
time (buffer stock)											
place (HCP)	X		X		X			X	X	X	
purpose (price discrim.)	X ^a	X			X					X	X
type of consumer		X									
2 Demand influences											
Mixing regulations or induced purchase by tariff						X	X				X
restriction of substitutes		X	X		X						
public consumption		X									
export contracts-bilateral	X			X	X						
3. Direct price augmentation											
buffer fund	X								X		
deficiency payment	X					X			X		
flat rate subsidy			X								
tax											

After Lewis (1967, Table 15-1) and Mauldon (1990)

1: wheat; 2: wholemilk; 3: butter/cheese/processed milk; 4: beef; 5: sugar; 6: cotton; 7: tobacco; 8: rice; 9: raisins/sultans/currants; 10: eggs; 11: peanuts

Notes: a. from 1968

L – land; W – water; Q – quantitative restrictions; T – tariff;

wheat marketing quotas were introduced and effective (except for cross-border trade) in the 1969-70 season.

wool deficiency payments were available in 1970.

Table A.4.3: Trading Systems, 1950-70

Industry trading system	Domestic & Export Markets	Domestic market	Export Market
Public	wheat, eggs		
Partially public	coarse grains, oilseeds	fresh fruit and vegetables	
Privately run/Publicly controlled	sugar, rice, dairy products, dried vine fruit,	wholemilk, tobacco	meat
Private	wool, cotton,	poultry, pigmeat	

Table A.4.4: Production, Domestic Use and Export of Major Crops, 1950-70 ('000t)

	Production	Domestic use	Export
Wheat	8298	2315	5961
Coarse grains	2534	1718	751
Cotton	15	27	8
Oilseeds	37	37	1
Rice	151	88	63
Sugar	1720	646	1074
Horticulture			
-dried vine fruit	88	24	64

Table A.5.1: Hilmer Reforms – IC Projected Implications for Industry Output

	State		Commonwealth	
	SMA's	All other	SMA's	All other
Pastoral zone	-1.99	1.99	0.74	0.64
Wheat sheep zone	3.72	3.62	0.53	0.86
High rainfall zone	-2.47	2.20	0.44	1.02
Northern beef	-0.38	10.15	2.30	2.97
Milk cattle	0.38	0.14	-15.61	0.07
Pigs	0.41	5.50	0.51	1.65
Sugar cane	0.53	14.18	2.10	4.53
Other farming export	0.64	3.36	0.05	1.03
Potatoes	0.71	1.79	0.10	0.5
Other farming import	0.42	2.30	-1.77	0.63
Poultry	0.24	3.62	0.33	1.08
Services to agriculture	0.07	1.98	-0.01	0.62

Source: Industry Commission (1995, Tables C2.4 and C2.8)

Table A.5.2: Summary of Agricultural Price Programmes, 1970-99

	1	2	3	4	5	6	7?	8	9	10	11	12
1. Supply management												
(i) supply level												
input restrictions					L↓			W↓?	W?	H↓		
import restrictions ^a	Z	X	T/Q		Q↓T	T?	T↓	X↓?	T/Q?	T		
marketing quotas		X			X		X↓					
(ii) supply diversion												
time (buffer stock)												↑X↓
place (HCP)	X↓		X		X↓			X↓?	X	X		
purpose (price discrim.)	X↓	X			X↓					X		
type of consumer												
2 Demand influences												
Mixing regulations or induced purchase by tariff							X↓					
restriction of substitutes		X	X↓		?							
public consumption		X↓										
export contracts-bilateral					?							
3. Direct price augmentation												
buffer fund	X								?			
deficiency payment ^b	X		?			X↓			?			X?
flat rate subsidy			X↓									
tax		X	X									

After Lewis (1967, Table 15-1) and Mauldon (1990W)

Industries – 1: wheat; 2: wholemilk; 3: butter/cheese/processed milk; 4: beef; 5: sugar; 6: cotton; 7: tobacco; 8: rice; 9: raisins/sultanas/currants; 10: eggs; 11: peanuts; 12: wool

Notes: ↑ - began during period; ↓ - substantially reduced or terminated during period

Z import prohibitions; T tariff; Q quantitative

a – phytosanitary controls (including prohibitions) for all biological material, which may intentionally or incidentally had (substantial) price effects

b – including underwriting;

Table A.5.3: Trading Systems, 1970-90

Industry trading system	Domestic & Export Markets	Domestic market	Export Market
Public	wheat↓, eggs↓		wheat*
Partially public	coarse grains↓, oilseeds↓	fresh fruit and vegetables↓	
Privately run/Publicly controlled	sugar↓, rice, dairy products, dried vine fruit, wool↓	wholemilk, tobacco	meat, sugar
Private	wool, cotton, eggs	poultry, pigmeat, sugar	

Notes: * Australian Wheat Board also trades in other grains and oilseed, but essentially as a private company and not with statutory monopoly powers

Table A.5.4: Production, Domestic Use and Export of Major Crops, 1971-97 ('000t)

	Production	Domestic use	Export
Wheat	13416	3210	10965
Coarse grains	6739	3441	3214
Cotton	203	26	169
Oilseeds	709	573	136
Rice	710	344	366
Sugar	3494	880	2614
Horticulture			
-dried vine fruit	72	27	45

Box A.5.1: Native Title Determination in *Mary Yarmirr & Ors v Northern Territory of Australia & Ors* (1998b)

THE COURT DETERMINES THAT:

1. Native title exists in relation to the sea and sea-bed within the area more particularly described in the schedule (the claimed area).
2. The native title is held by the Aboriginal peoples who are the yuwurrumu members of the Mandilarri-Ildugij, the Mangalara, the Murran, the Gadura-Minaga and the Ngaynjaharr clans (the common law holders).
3. (Name of body corporate) after becoming a registered native title body corporate is to perform the functions mentioned in section 57 (3) of the Native Title Act 1993.
4. The native title rights and interests do not confer possession, occupation, use and enjoyment of the sea and sea-bed within the claimed area to the exclusion of all others.
5. The native title rights and interests that the Court considers to be of importance are the rights and interests of the common law holders, in accordance with and subject to their traditional laws and customs to -
 - (a) fish, hunt and gather within the claimed area for the purpose of satisfying their personal, domestic or non-commercial communal needs including for the purpose of observing traditional, cultural, ritual and spiritual laws and customs;
 - (b) have access to the sea and sea-bed within the claimed area for all or any of the following purposes:
 - i) to exercise all or any of the rights and interests referred to in subparagraph 5(a);
 - ii) to travel through or within the claimed area;
 - iii) to visit and protect places within the claimed area which are of cultural or spiritual importance;
 - iv) to safeguard the cultural and spiritual knowledge of the common law holders.
6. The native title rights and interests of the common law holders in relation to the sea and sea-bed within the claimed area may be affected by rights and interests in relation to the sea and sea-bed within the claimed area validly granted or which exist or which may hereafter exist pursuant to the laws of the Commonwealth of Australia and of the Northern Territory of Australia.

AND THE COURT ORDERS that each party pay its own costs of and incidental to the proceeding including any reserved costs.

cf. *Mary Yarmirr & Ors v The Northern Territory of Australia & Ors* (1998a)

Box A.5.2: Native Title Determination in Ben Ward & Ors v State of Western Australia & Ors [1998]

1. Native title exists in the "determination area" as defined below except those areas of land or waters as are described in the 2nd Schedule. The "determination area" is that part of the land or waters within the areas outlined in red on the map in the 1st Schedule as does not include land or waters in respect of which no application for determination of native title was made by the first applicants in the application lodged by them with the National Native Title Tribunal ("the Tribunal") referred to the Court by the Tribunal for decision.
2. Native title in the "determination area" is held by the Miriuwung and Gajerrong people, and in respect of that part of the "determination area" known as Boorroonoong (Lacrosse Island), native title is also held by the Balangarra Peoples, both parties being described hereafter as the common law holders of native title.
3. Subject to par 5 hereof, the nature and extent of the "native title rights and interests" in relation to the "determination area" are the rights and interests of the common law holders of native title derived from and exercisable by reason of the existence of native title, in particular:
 - a) a right to possess, occupy, use and enjoy the "determination area";
 - b) a right to make decisions about the use and enjoyment of the "determination area";
 - c) a right of access to the "determination area";
 - d) a right to control the access of others to the "determination area";
 - e) a right to use and enjoy resources of the "determination area";
 - f) a right to control the use and enjoyment of others of resources of the "determination area";
 - g) a right to trade in resources of the "determination area";
 - h) a right to receive a portion of any resources taken by others from the "determination area";
 - i) a right to maintain and protect places of importance under traditional laws, customs and practices in the "determination area"; and
 - j) a right to maintain, protect and prevent the misuse of cultural knowledge of the common law holders associated with the "determination area".
4. The nature and extent of any other interests in relation to the "determination area" are the interests created by the Crown as set out in the 3rd Schedule.
5. The relationship between the "native title rights and interests" described in par 3 and the "other interests" described in par 4 is as follows:

"The native title rights and interests" described in par 3 hereof and the "other interests" described in par 4 hereof are concurrent rights and interests in relation to that part of the "determination area" to which the other interests relate, but by operation of legislation or by the nature and extent of the other interests created by the Crown, regulation, control, curtailment, restriction, suspension or postponement may operate upon the exercise of some of those concurrent rights.
6. Within twenty-eight days the common law holders of native title are to file any minute of proposed determination under ss 56 and 57 of the Native Title Act 1993 (Cth) and if no such minute is filed it is determined that native title is held by common law holders.
7. There be liberty to apply as to costs and to refer to the National Native Title Tribunal for mediation issues arising out of the relationship between native title rights and interests and other interests in relation to the "determination area".

Figure A.1.1: 9 Year Moving Averages for Selected Australian Sites

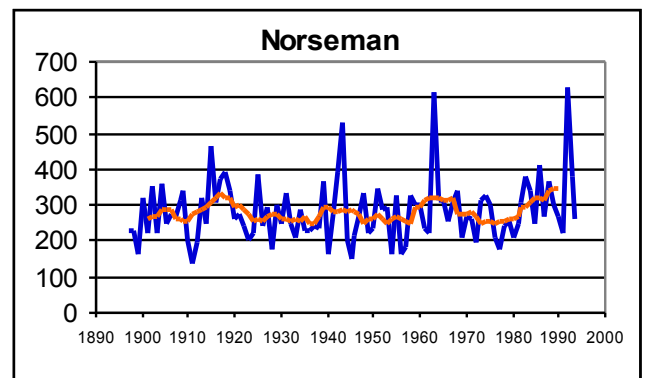
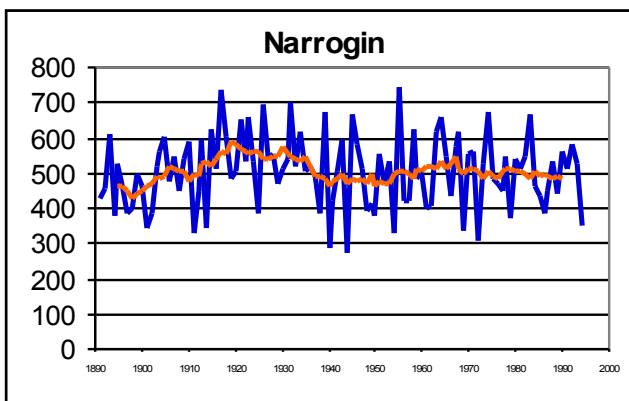
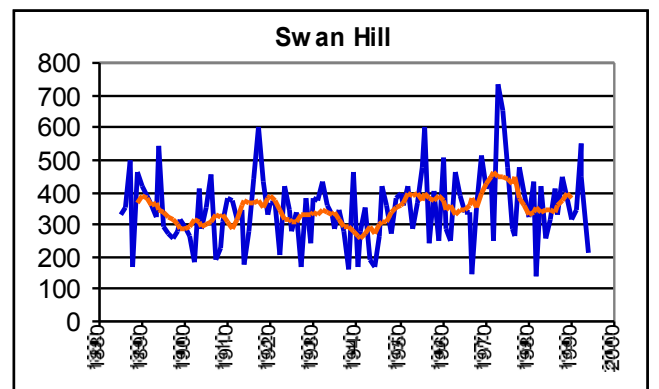
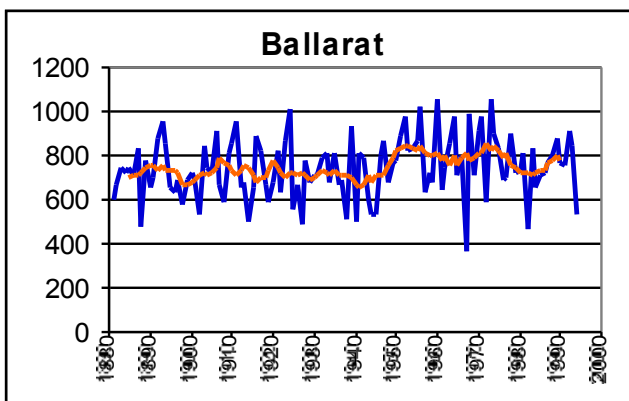
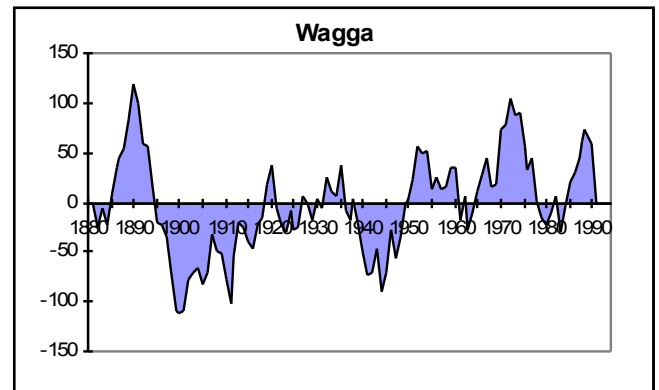
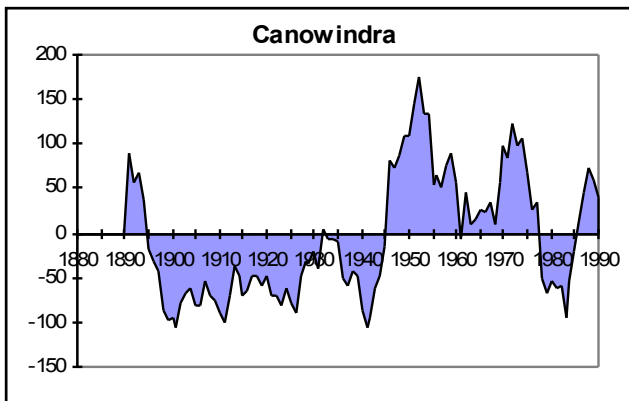
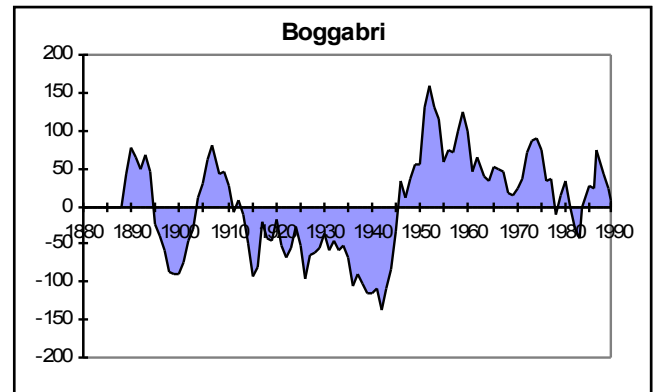
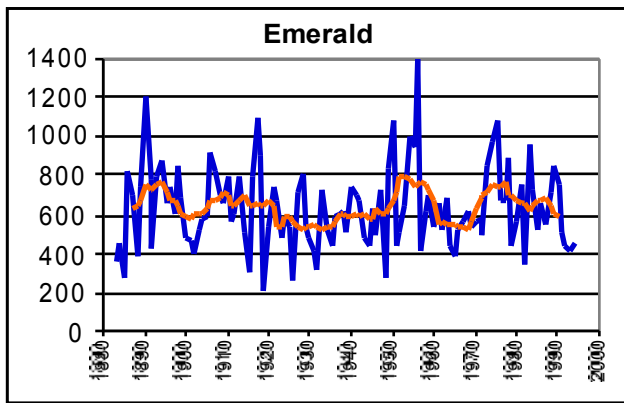


Figure A.1.2 – Davidson 1981, Figure 12-1

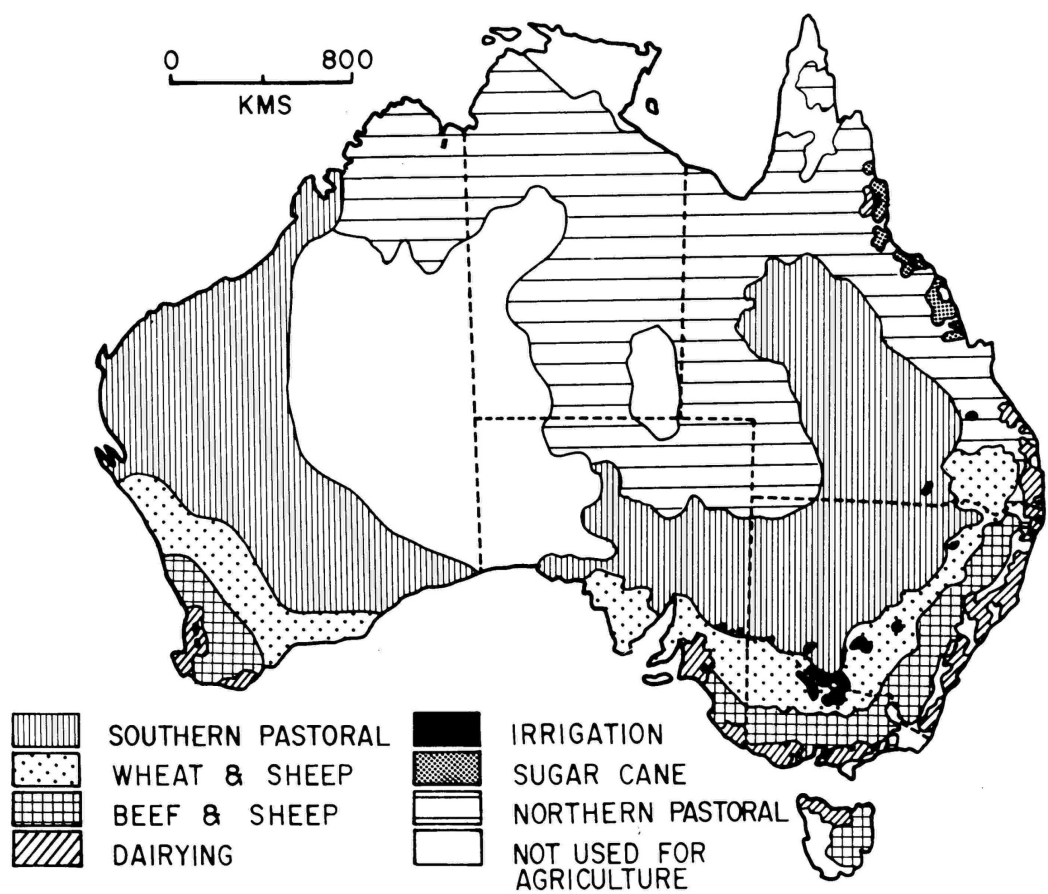
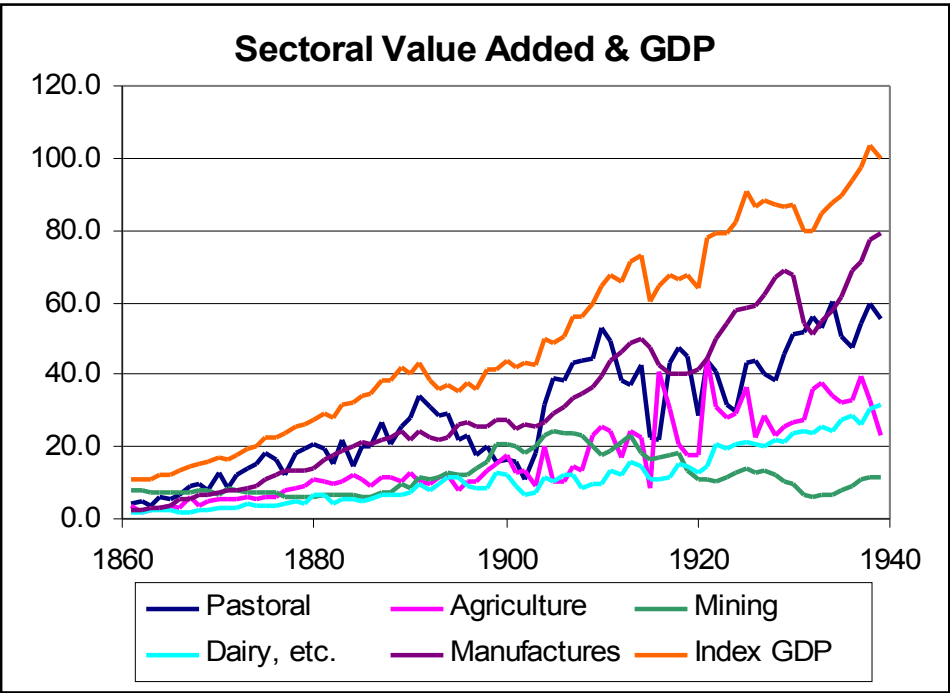


FIGURE 12-1 Farming and grazing zones

Source: Davidson, 1967, p. 38.

Figure A.1.3: Butlin deflated GDP



Source: Butlin (1962a, Table 269, £m in 1910/11 prices)

Figure A.1.4: Butlin GDP shares

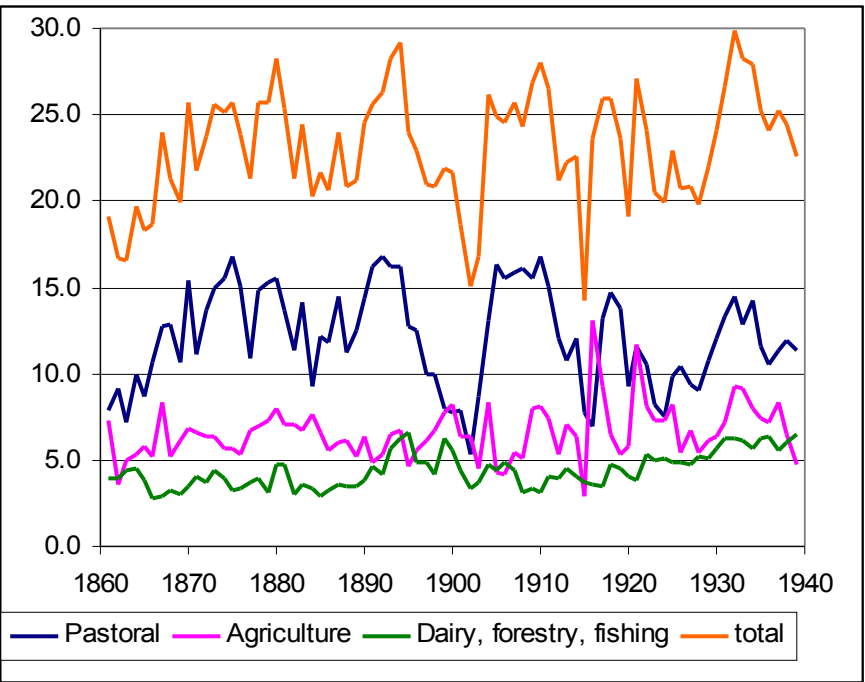
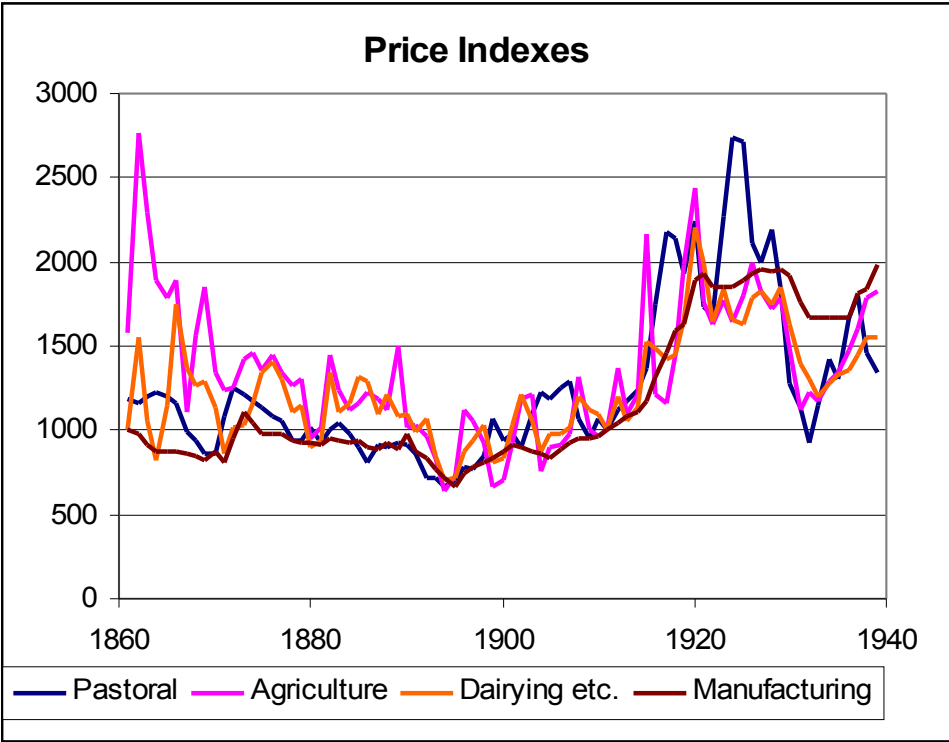
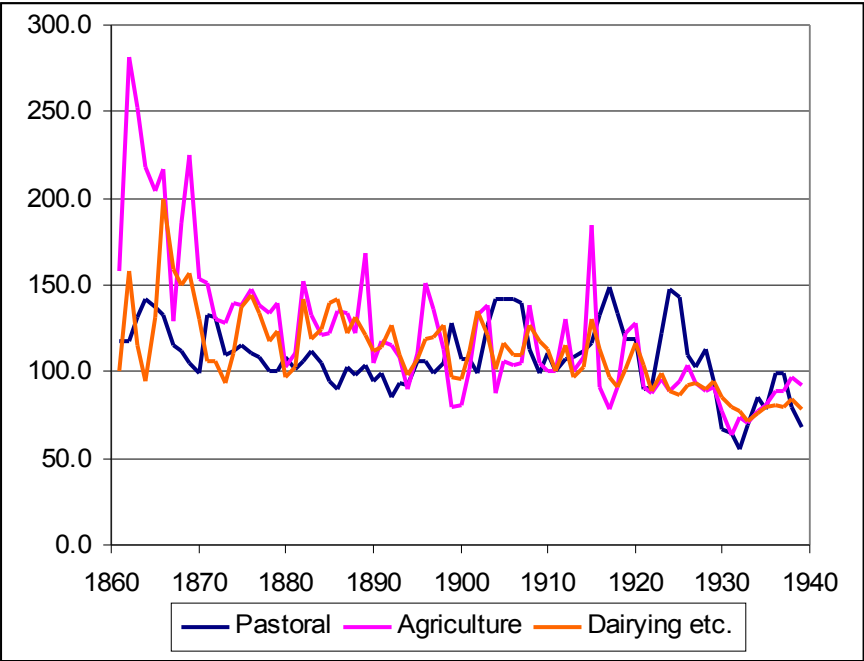


Figure A.1.5: Butlin output prices



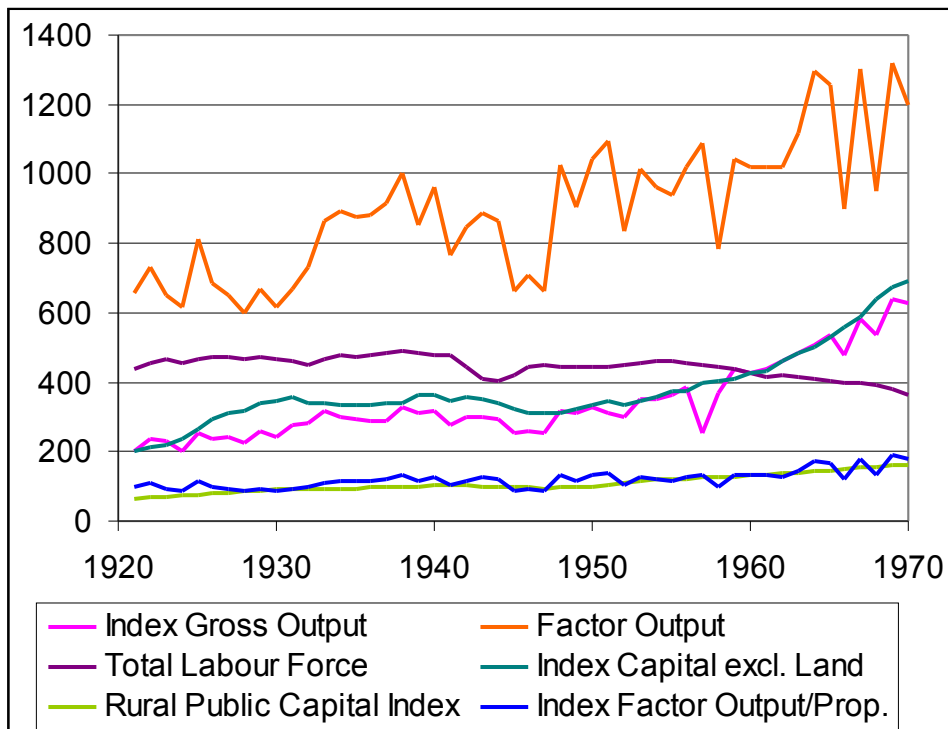
Source: Butlin (1962a, Table 267, 1910/11 = 1000)

Figure A.1.6: Butlin output prices – relative to prices of manufactures



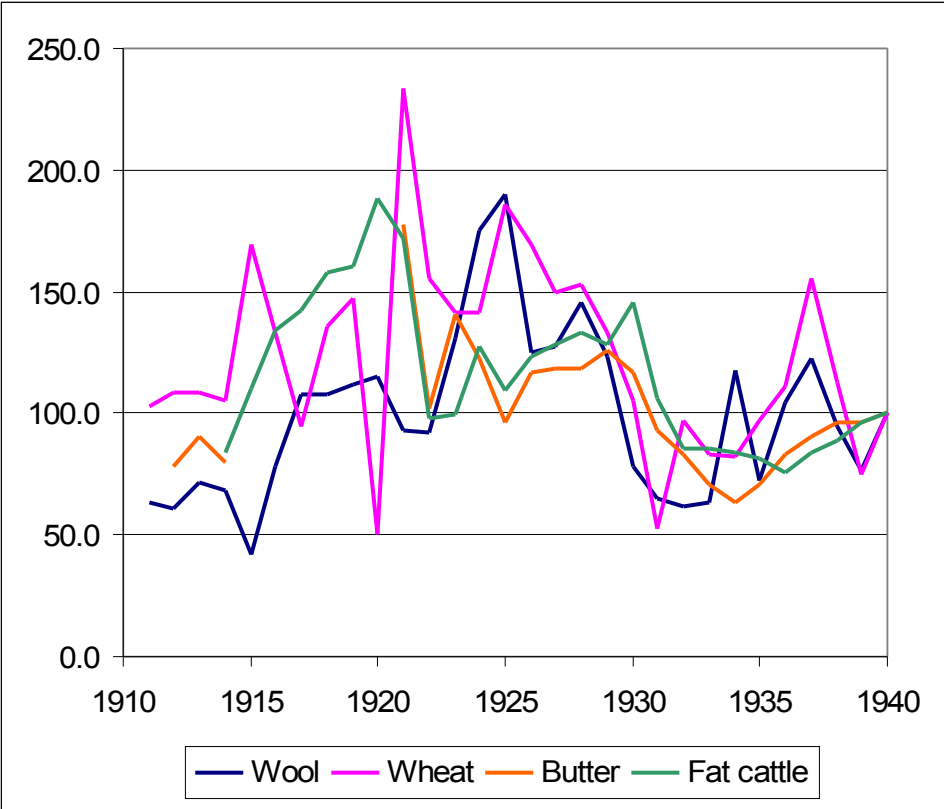
Source: Butlin (1962a)

Figure A.2.1: Powell's sectoral value added data: Gross Output (\$m 1949-50), Total Labour Force ('000), Capital Stock excluding Land (\$m 1949-50) and Factor Output (value added) (\$m 1949-50)



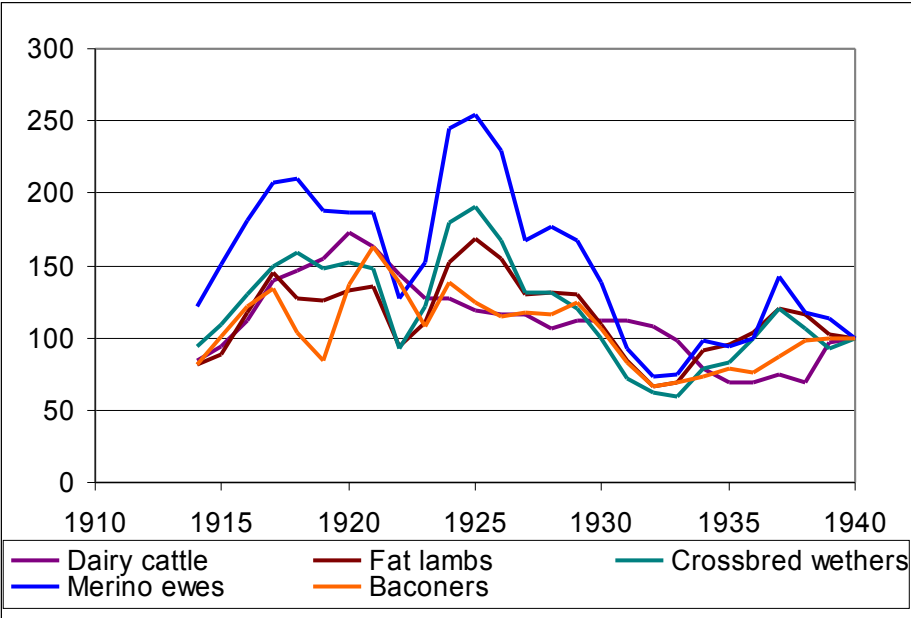
Source: Powell (1974)

Figure A.2.2: Commodity Price Indexes (1939=100)



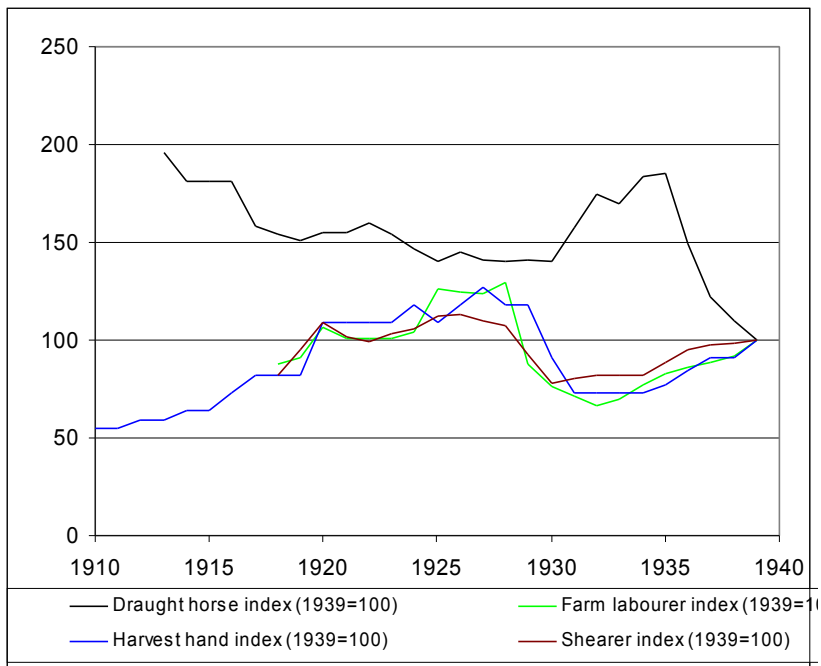
Source: Davidson (1981)

Figure A.2.3: Commodity Price Indexes (1939=100)



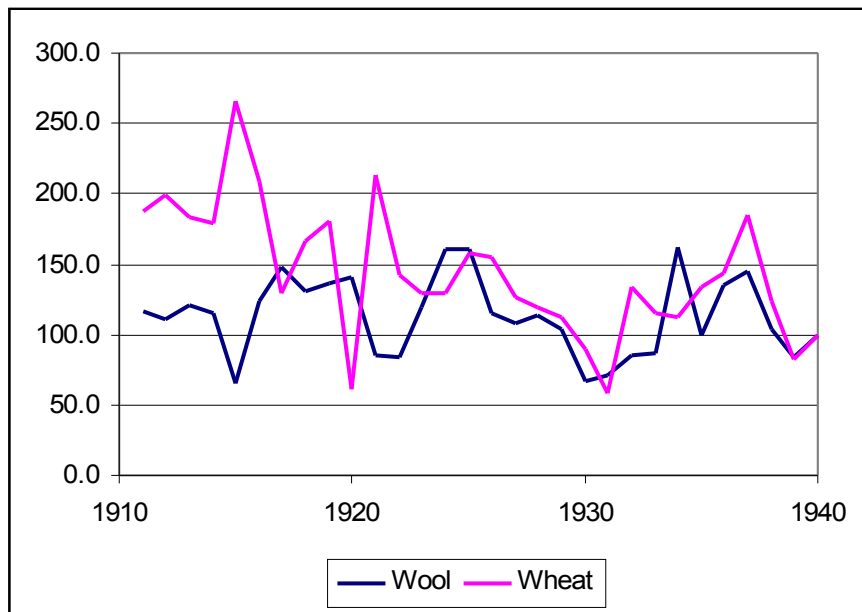
Source: Davidson (1981)

Figure A.2.4: Input Price Indexes (1939=100)



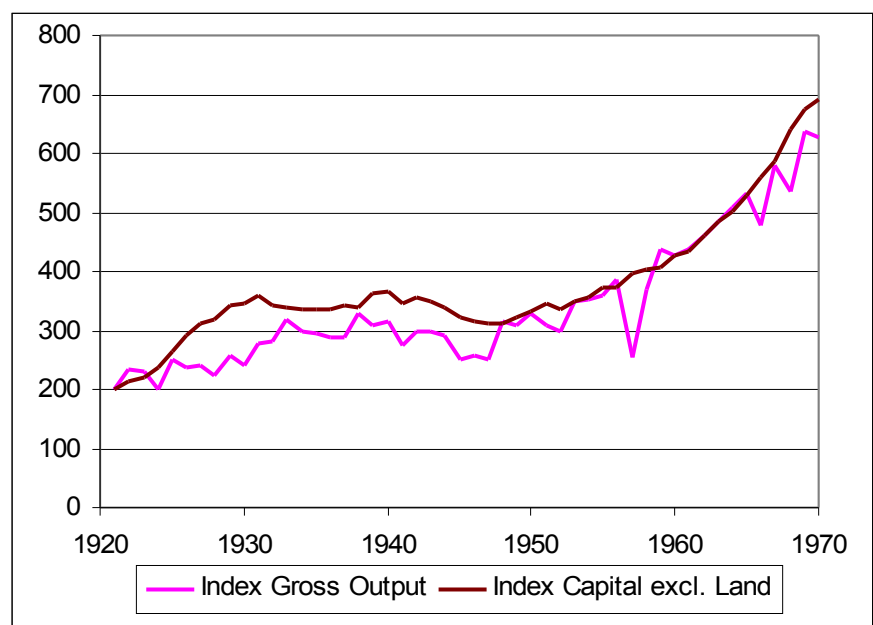
Source: Davidson (1981)

Figure A.2.5: Output Prices relative to Labour Rate (1939=100)



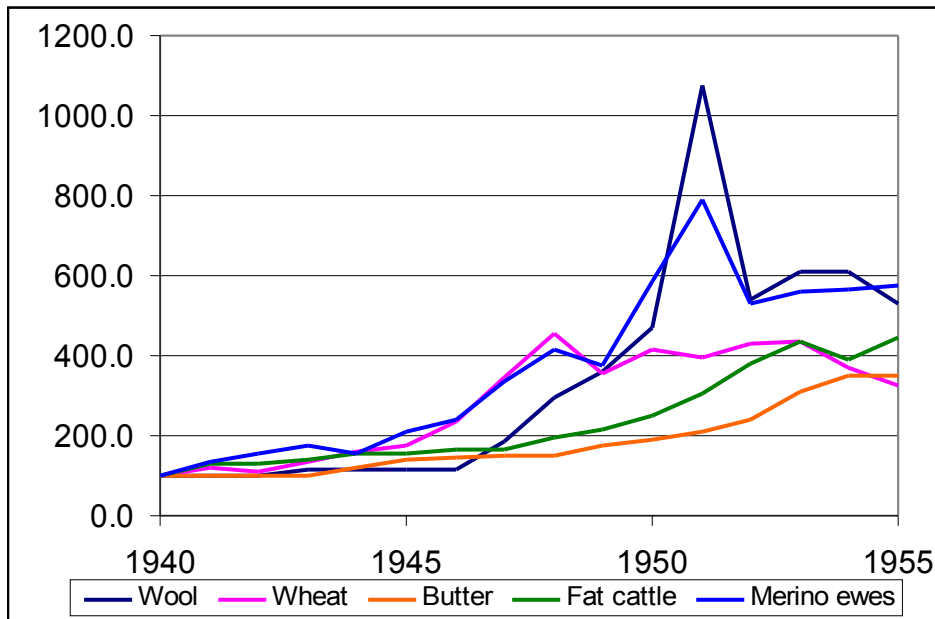
Source: Davidson (1981)

Figure A.2.6: Indexes of Gross Output and Non-Land Capital Stock



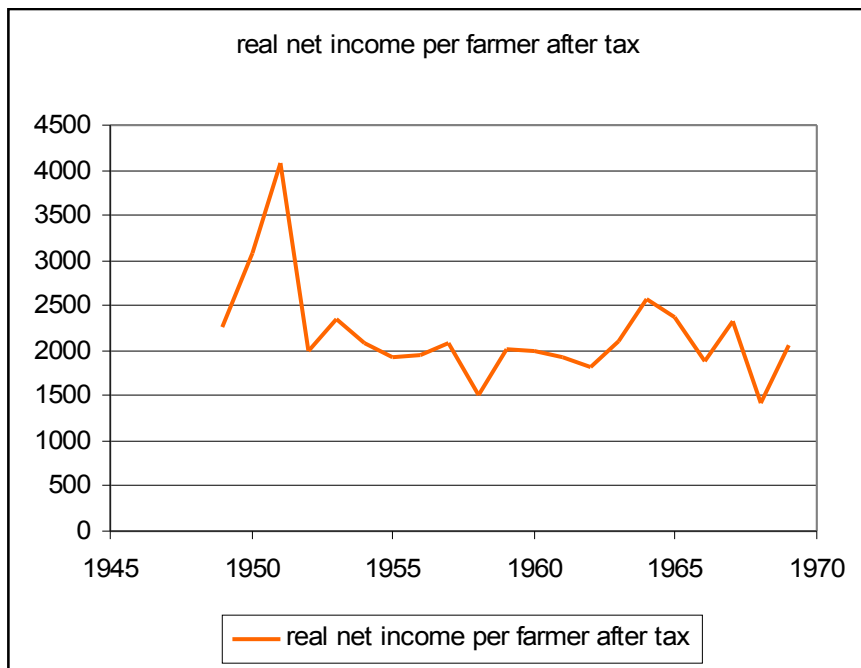
Source: Powell (1974)

Figure A.3.1: Farm Product Prices Indexes (1940=100)



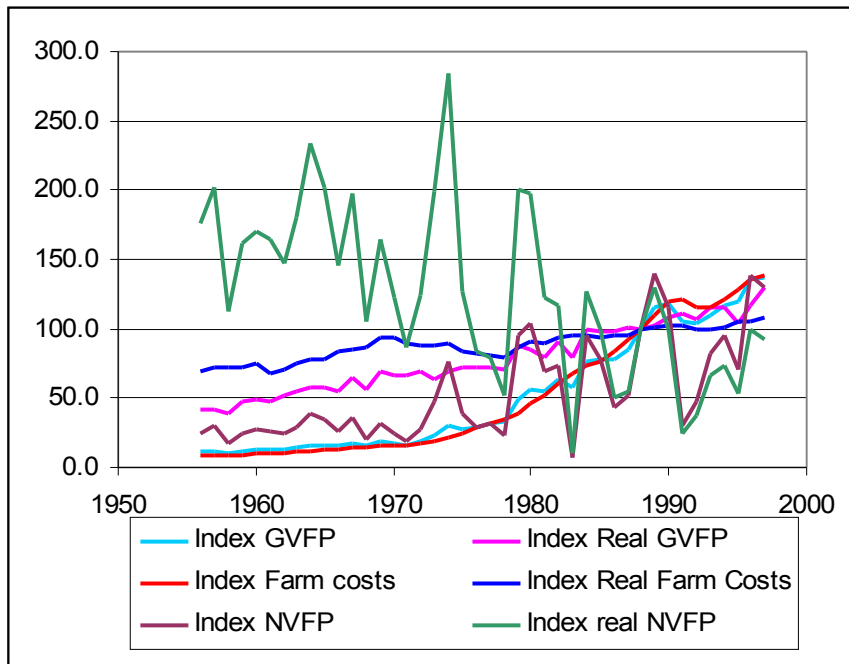
Source: based on Davidson (1981, Table 15-1)

Figure A.4.1: After-tax Real Net Farm Income per Farmer,



Source: Glau (1972, Table 3)

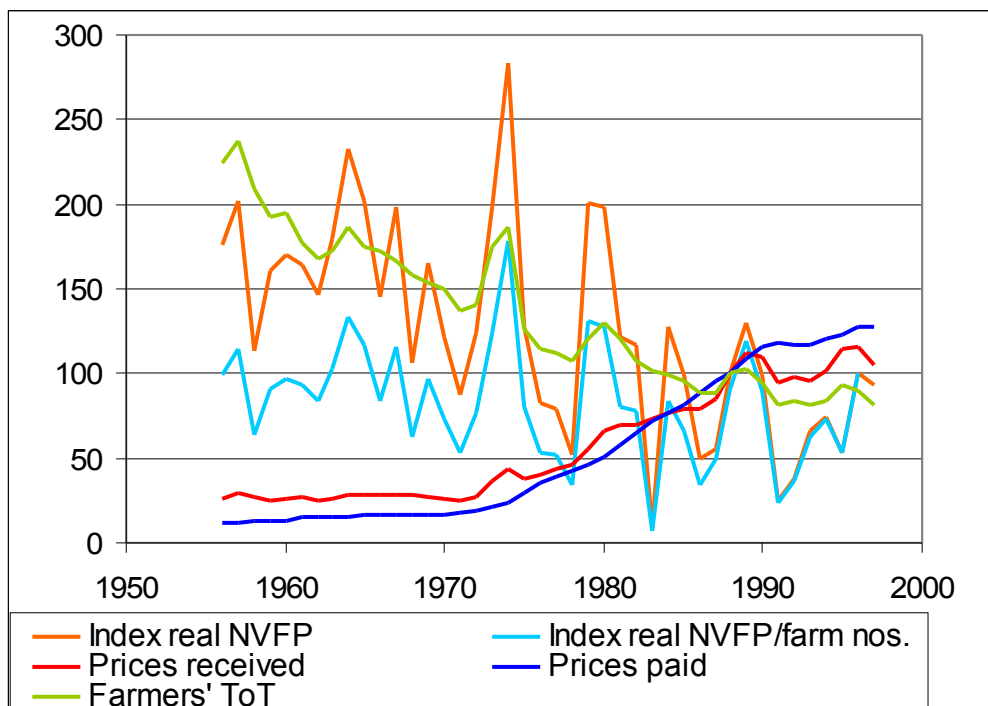
Figure A.4.2: Indexes of Farm Production, Costs and Net Value (nominal and deflated)



Source: ABARE (1997, Table 19).

Note: Production is deflated by prices received; costs by prices paid; and net value by CPI

Figure A.4.3: Indexes of Real Net Value of Farm Production, Prices Received, Prices Paid and Farmers' Terms of Trade



Source: ABARE (1997, Table 19).

Figure A.4.4: Indexes of Crop and Farm Area and Livestock Numbers

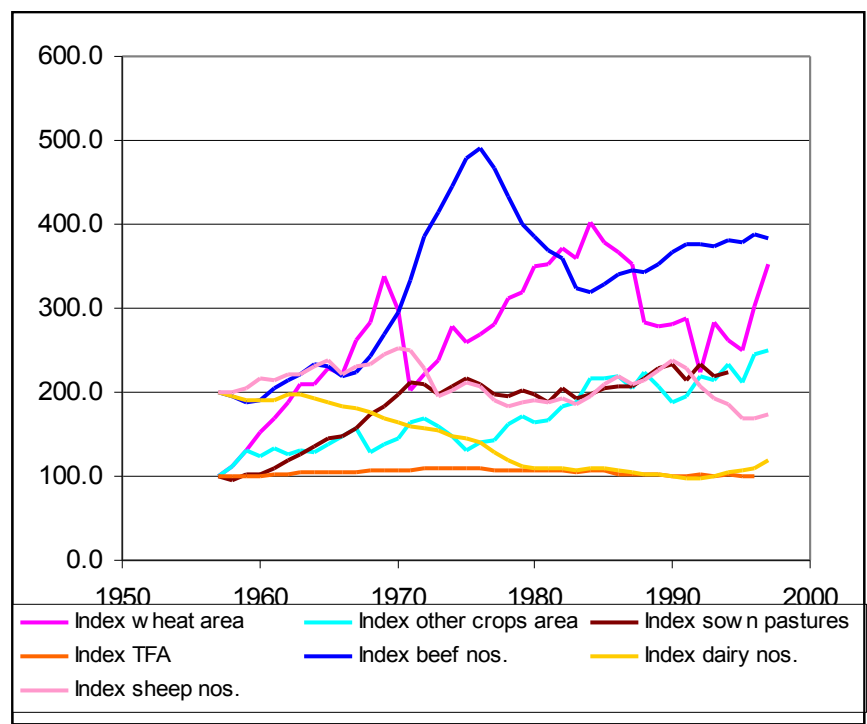
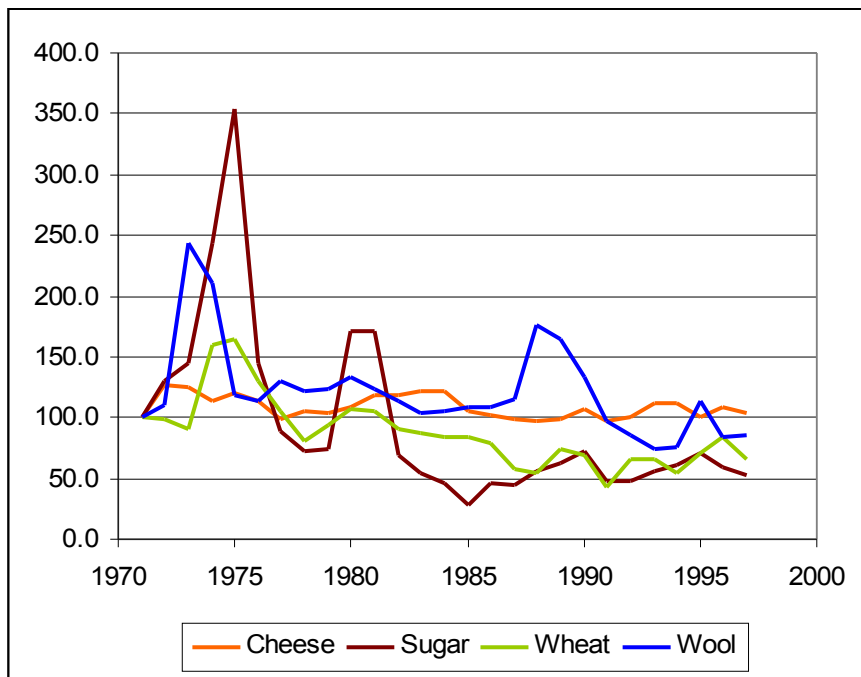
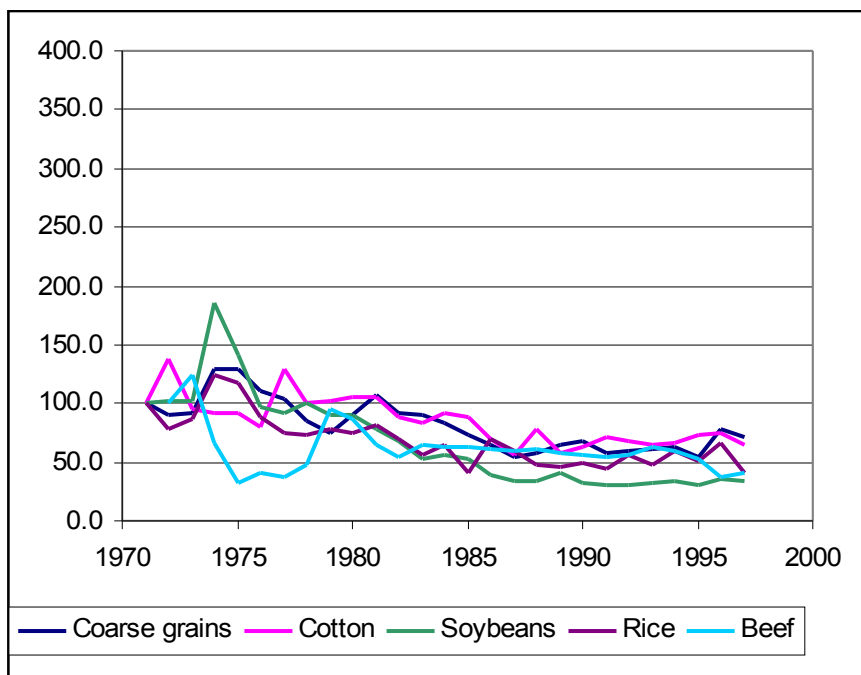


Figure A.4.5: Export Prices Relative to Domestic Prices Paid (indexes)

(a) Cheese, Sugar, Wheat, Wool



(b) Coarse grains, Cotton, Rice, Soybeans, Beef



Note: the beef price index commences as 100 in 1972 compared to 1971 for other commodities.