The Australian Journal of
Agricultural and
Resource Economics

Journal of the Australian Agricultural and Resource Economics Society

Australian Journal of Agricultural and Resource Economics, 59, pp. 317–333

Assistance to Australian agriculture from Federation to World War II*

Peter Lloyd and Donald MacLaren†

This paper quantifies the levels of assistance received by producers of the major agricultural crops and animal products in Australia from Federation to the end of World War II. We outline the history of government assistance to the sector after Federation. Six measures of assistance are examined. Then the nominal rates of assistance from these measures are calculated for 20 agricultural products, 14 of which are classified as exportables and 6 as importables. From these product measures of assistance, we construct a series of the production-weighted average nominal rate of assistance for the group of exportable products and for the group of importable products and for the whole sector. Our results show that, from the time of Federation, the pattern of assistance to the sector discriminated persistently and heavily against the exportable agricultural products.

Key words: agricultural commodities, measures of assistance, nominal rates of assistance.

1. Introduction

From the beginning of Federation in Australia, farmers and other agricultural producers have received assistance from the Commonwealth Government. From 1901, butter producers received protection from imports in the form of a prohibition of imports of margarine and butter substitutes 'unless coloured and branded as prescribed' and sugar producers received a bounty on cane grown and harvested by white labour from 1902. New forms of assistance to particular agricultural producers came in every succeeding decade until the end of World War II. In this paper, we quantify the levels of assistance received by agricultural producers of the major crops and animal products in Australia and the average for the whole sector from the time of Federation until the end of World War II.

There are no existing quantitative measures of the assistance levels for any of the major agricultural crops and animal products in the period prior to the end of World War II. The sole estimate we have found is that by Lloyd (1950, p. 44) for assistance to butter producers over the 5-year period of the

* We wish to thank Kym Anderson, Robert Dixon, Geoff Edwards, John Freebairn and Alistair Watson for their helpful comments. We also acknowledge with thanks the assistance given by the Editor and Associate Editor.
† Peter Lloyd (email: pjlloyd@unimelb.edu.au) and Donald MacLaren are at Department of Economics, Faculty of Economics and Commerce, The University of Melbourne, Parkville, Victoria 3010, Australia.

doi: 10.1111/1467-8489.12069

Paterson Plan. His estimate of the increase in farm incomes was £2,677,500 per annum. Stuart Harris (1964) was the first to provide quantitative measures of the assistance levels for major agricultural crops and animal products in Australia. His series covers the period 1946–1947 to 1962–1963 and relates to what is nowadays called the nominal rate of assistance.[1] Harris's series were extended by the Bureau of Agricultural Economics to 1970–1971 (published in Lloyd 1973, pp. 149–158). Anderson *et al.* (2007) reworked and extended the series further forward to 2004–2005. In this paper, we extend these post-World War II series for agricultural products backwards to 1903.

As background, in Section 2 we review the major agricultural commodities exported and imported by Australia in the pre-World War II period, and the list of commodities for which estimates of nominal rates of assistance will be provided. In Section 3, we review the major measures that were used to assist both export- and import-competing agricultural producers in this period. This review shows how agricultural policies evolved after Federation. We then report, in Section 4, the series of nominal rates of assistance for the major agricultural crops and animal products for each year in the period 1903 to 1945–1946. Next, in Section 5, we report the series of nominal rates of assistance over the pre-World War II period for the exportables, importables and for the whole sector. There is a brief conclusion in Section 6.

2. The Agriculture sector

The size of the Agriculture sector (including forestry and fisheries) was roughly comparable with that of the Manufacturing sector, in terms of its contribution to both GDP and civilian employment, up to the outbreak of World War II. Anderson *et al.* (2007, table 1) provide series for the contribution to GDP since Federation and a series for civilian employment by sector from 1961, while Butlin and Dowie (1969) provide statistics for the years before 1961. The Services sector has provided close to, or more than, 50 per cent of both output and employment from the time of Federation. The Agriculture sector's share of both employment and output has declined steadily since the beginning of Federation.

The Agriculture sector's share of international trade is of more direct interest to us. This sector was (and still is) primarily a producer of exported commodities rather than imported commodities. Figure 1 provides a graph of the share of the major agricultural commodities in the value of total agricultural exports for the period 1901–1902 to 1937–1938.

Several features of the distribution of agricultural exports stand out. Wool dominates agricultural exports throughout the whole period, its share being more than 50 per cent in most years. Grains is the second most important

[1] Harris produced a number of series, but his series in terms of deviations from world prices accords with the modern perception of price distortions.

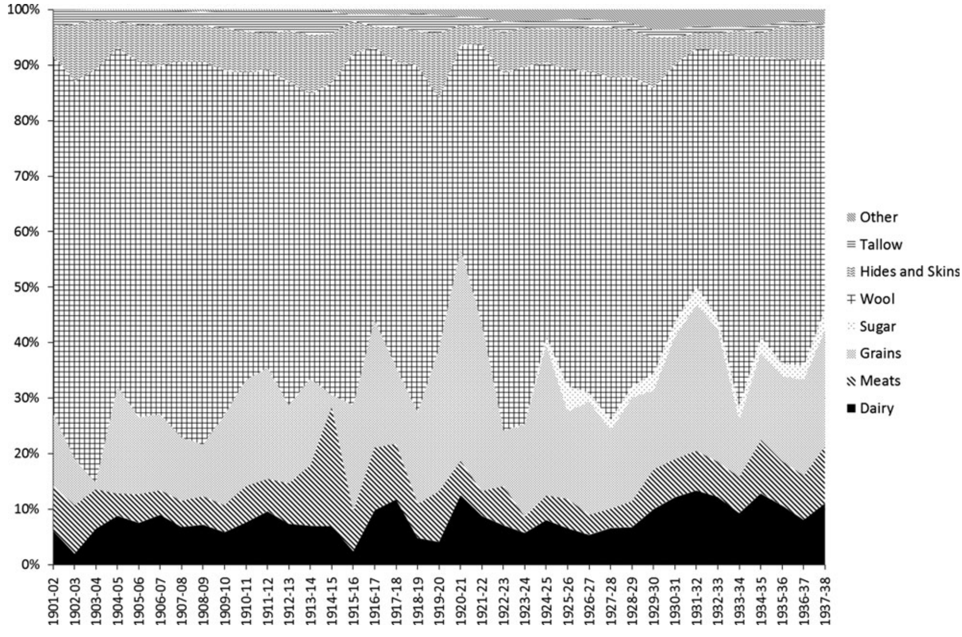

Figure 1 Commodity composition of agricultural commodity exports, Australia, 1901–1902 to 1937–1938. Source: Commonwealth of Australia, *Trade and Customs and Excise Revenue* (various), ABS 5409.0. Note: The year 1937–1938 was the last for which exports from Australian production were published. Thereafter, exports included re-exports.

product group, adding another 10–20 per cent in all years. Wool and grains are broadacre temperate products. Meat and dairy are the next most important export product groups. There has been a progressive diversification of both farm exports and farm imports since Federation as new products have been introduced to Australia. Sugar becomes a major export from the early 1920s and the catch-all 'Other products' becomes progressively more important. Conversely, a few products which were major items of production and export in the early days after Federation have become unimportant, namely tallow and also hides and skins.

Imports of agricultural commodities were much less important as a share of total merchandise imports. They accounted for <20 per cent of total merchandise imports, and in most years, they were <10 per cent. Consequently, many more of the commodities in our commodity list are exported rather than imported. There were, however, substantial imports by value of some agricultural products, for example tea, tobacco, copra, rice and raw cotton.

Following Anderson *et al*. (2007), we divide agricultural commodities into three categories – exportables, import-competing and nontradables. There are, however, several difficulties in partitioning the set of all agricultural commodities produced into these three subsets or categories.

The first difficulty is that for nearly all agricultural product groups, there are simultaneous exports and imports of different products within a group.

For example, from the mid-1920s, Australia was a substantial exporter of cane sugar and a net exporter of sugar and sugar products, but it remained a substantial importer of processed sugar products such as golden syrup and molasses. Today, we call this intra-industry trade. For our purposes, we select the main product traded in a group. In the case of the sugar product group, this is cane sugar, an exportable. In the case of cotton, it is raw cotton, and in the case of tobacco, it is unmanufactured tobacco.

The second related difficulty is that products as defined in the previous paragraph were imported in some period but became exported in a later period as new products and new technologies of production were introduced, or vice versa. Cane sugar was initially imported before it becomes an export good. Similarly, rice was imported for more than two decades but by the 1930s had become a substantial export, and dried vine fruits, which were initially a large net import item, had become a large net export item by the 1920s. These three goods are classified as exportable for the whole period. Tobacco – unmanufactured tobacco as distinct from the manufactured products such as cigars and cigarettes – was initially exported, but it had become an imported commodity by the outbreak of World War I. It is classified as an importable. Cotton was imported throughout the pre-World War II period, despite attempts to establish a cotton export industry soon after Federation. Imports continued until the late 1960s when large-scale wetland cotton farming began, initially in the Namoi region of NSW, and cotton exports grew.

A third related difficulty is that, in some periods, a product which is actually exported is protected from import competition on the home market. The outstanding examples are sugar and processed dairy products (butter and cheese). Unprocessed food products such as apples, oranges and potatoes are net exports in some years and net imports in others because of fluctuations in Australian annual outputs and in border prices.

The list of agricultural crops and products covered comprises 20 commodities: 14 of these are exportables and 6 are importables (see the lists in Tables S1 and S2 which are in Supporting information). The classification as exportables or importables is determined, in the case of those commodities which switch at some time from being a net export to a net import or vice versa, on the basis of aggregate net exports/imports over the whole period. Of course this status as net export or import good in the actual trade data is affected by the level of assistance to these goods.[2]

Our product list is a modification of the list in Anderson *et al.* (2007). Some inclusions and exclusions are arbitrary. Conventionally, butter and cheese have been regarded as farm products although they are processed in off-farm factories. By comparison, wine (as distinct from winegrapes) is conventionally regarded as a nonagricultural product. Yet, wines, like butter and cheese,

[2] The status of a net export could be reversed to one of a net import good under a free trade regime. This might be the case for bananas and sugar and even butter.

are produced in rural areas and, especially in the pre-World War II period, were mostly processed on the premises where the grapes were grown. Butter and cheese (dairy products) are included and Wine is omitted from the product list, as they were in Anderson *et al.* (2007). Sorghum, rapeseed (canola), sunflower, oilseeds, olives and soya bean, which were included in the Anderson *et al.* (2007) product list for the post-World War II period, are not covered as the products were not produced in Australia on a significant scale and were little traded before World War II. The one nontradeable commodity covered in the post-World War II period, eggs, had to be combined with poultry because of the absence of value of production data for eggs separately in the earlier period.

For each selected commodity, we need a scalar measure of the rate of assistance. Ideally, this should be the effective rate of assistance, that is, the percentage change in value added per unit of output. This measure takes account of assistance to producers through subsidies or reduced prices of farm inputs as well as assistance that raises the prices of farm outputs. It is the effective rates that change the allocation of resources by producers in the economy. Beginning in 1922–1923, subsidies were introduced on major farm inputs, chiefly fertilisers and tractors to assist farmers. Effective rates of assistance to producers of agricultural products have been calculated by the Industry Commission and its successor authorities, starting with the year 1970–1971, but these rates are not available for previous years. Consequently, we have to use the nominal rates of assistance. Fortunately, the nominal and effective rates are highly correlated over the period for which both series are available (Lloyd and MacLaren 2014, figure 3).

We define the nominal rate of assistance as the percentage deviation of the (average) price received by Australian producers from the world price at the Australian border. For most exportable commodities, this involves a direct comparison of the home price and the export price. If an 'exportable' is imported or threatened with imports during some period, assistance to an 'exportable' is defined as the rate of assistance from tariffs and any other import-restricting measure that applied, if any. For importables, it involves a calculation of the average of the specific General (=MFN) rate and the British Preferential rates and any other preferential rates and then conversion to an ad valorem equivalent rate plus assistance from any other measure.

With respect to the period coverage, our series cover the periods of World Wars I and II. In World War I, prices were fixed for a large number of farm commodities. Shipping to the United Kingdom, the major market for most agricultural exports, was severely dislocated but production was not controlled. A special effort was made to increase wheat production. World War II disrupted goods trade flows to a much greater extent than had World War I (Crawford *et al.* 1954). Shipping to the United Kingdom, still the major market for most agricultural exports at that time, was very severely dislocated. Farm capital was run down, farm labour was in very short supply, and supplies of materials such as fertilisers and fencing wire were very limited. There was a substantial reduction in the areas devoted to principal crops. Prices of major agricultural commodities in Australian markets were again controlled (Commonwealth Bureau of Census and Statistics 1945). Exports of food and wool were directed to the United Kingdom. (For information on the marketing and regulation arrangements during World War II, see Crawford *et al*. (1954, pp. 81–83) and the *Commonwealth Year Book* (1944–1945, p. 961).)

Given the extent of restrictions on supply and market regulation and the absence of free market prices on world markets, the rates of assistance in the war years are not strictly comparable to those of the non-War years. Undoubtedly, the most serious long-term consequence of World War II for assistance policy in Australia generally was the introduction of import licensing in 1939 which provided strong encouragement to the production of more manufactures until it was ended in 1962.

3. Measures of assistance in the pre-World War II period

Accounts of assistance to agricultural producers in the period before World War II are scattered and incomplete compared with those available for the post-World War II period. Crawford *et al*. (1954) provide a detailed account of the sector in the years of World War II. Copland and Janes (1937) is a useful source of documents for the period 1932–1937. Rural Reconstruction Commission (1946) contains much information and trade data series for the period of the Second World War and also the decades of the 1920s and 1930s. We have found no account of assistance for the first two decades of Federation.

In fact, measures to assist some Australian farmers came in with Federation. Butter producers received protection from imports in the form of a prohibition of imports of margarine and butter substitutes 'unless coloured and branded as prescribed' from 1901. As a concession to Queensland to join the Federation, the Commonwealth paid a bounty in 1902 on sugar cane grown and harvested with European labour, as the cheap Melanesian labour ('kanakas') was mostly repatriated after Federation under the White Australia policy. The measure was funded by an excise tax on the production of manufactured sugar but this lasted only until 1914. The Bounties Act 1907 offered bounties for the production of primary products which were currently imported and not produced or produced on a small scale in Australia: vegetable fibres such as flax and jute, rice, rubber, coffee, tobacco leaf, cotton and some dried fruit. It also provided the first export subsidy (called officially an 'export bounty') on fruit which was dried and exported. This Act was part of the 'new protection' policy of that year, and it was accompanied by similar infant industry subsidies to iron and steel products under the Manufacturer's Encouragement Act 1908. The rates of subsidy for agricultural products under the Bounties Act 1907 were low, mostly at the rate of 10 per cent (of ‘market value’), and irregular and lasted for only 12 years. These bounties were discontinued in 1918.

New measures to assist some Australian farmers were introduced in the 1920s. To encourage further sugar production, in 1920 the Commonwealth raised the domestic price of sugar by 50 per cent, to a level well above the world price. To prevent imports, it instituted in 1923 a prohibition on sugar imports that lasted until 1988. In the early 1920s, as farm prices fell and soldier settlers got into difficulties, home price schemes operated over some periods by some State Governments for products such as dried vine fruits, canned fruit and butter. The 1926 Paterson Scheme introduced a Commonwealth home consumption price scheme for butter. (The scheme was intended to cover cheese but there was insufficient industry cooperation to make it operational.) The scheme ceased in May 1934, after it was declared invalid by a decision of the High Court. The Paterson Plan provided a Commonwealth prototype for home consumption price schemes which was later followed in wheat and other markets in the post-World War II period. The Commonwealth endeavoured to assist export industries by legislating for the establishment of a number of export control boards: dried vine fruits in 1924, canned fruits in 1926 and wine in 1929. Their main functions, however, were to regulate overseas marketing and to maintain minimum product quality standards.

Further new measures to assist some Australian farmers were introduced in the 1930s. Prices slumped in the Depression years; during the 1930s, agricultural prices averaged 33 per cent less than the average for the 5 years ending 1927–1928 (Crawford *et al.* 1954, p. 17). Prices for wheat were particularly badly hit,[3] and the Commonwealth Government held a Royal Commission on the wheat industry. From 1931 to 1932, relief assistance was granted by the Commonwealth government to wheat growers, dairy farmers, fruit growers and some other rural producers. Drought relief was given by the Commonwealth government to wheat growers in the War years 1940–1941 and 1941–1942, and grants were made to the States to be passed on to farmers for drought relief. The leaf content plan for tobacco growers was introduced in 1936.[4] Legislation for a wheat stabilisation scheme was introduced in 1938, but war intervened and the scheme did not operate until 1948. The State Governments also introduced new measures, but these are outside the scope of this study.

A number of producer groups which produced importable commodities were protected by tariffs from the time of Federation. These included producers of products such as tobacco, maize, dried vine fruits, bacon and

[3] The Adelaide wheat price halved in the 2 years from 1929 to 1931, from over 400 shillings to <200 shillings per bushel (Commonwealth of Australia 1935, figure III).

[4] The minimum content was originally set at 2.5 per cent for cigarettes and 13 per cent for cut tobacco. It was increased several times, reaching the maximum of 50 per cent in 1966. Under the Tobacco Industry Stabilisation Plan, manufacturers agreed in 1977 to a further increase to 57 per cent. This was ‘voluntary’ and intended as temporary but it lasted until 1995.

ham, and pork, the first two of which remained net import goods throughout the pre-World War II period. Some goods which were exported also received significant tariff protection, for example butter and cheese. All of the duties levied on imported agricultural products were specific, and the rates of duty in ad valorem equivalent terms were sometimes high. The sole ad valorem tariff for the products on our list was the New Zealand Preferential rate on pork of 10 per cent which was introduced in 1922 (see Table A3, column on 'Pork').

Some import-competing agricultural products received substantial implicit protection from the quarantine regulations. These are a type of prohibition conditional on events such as an outbreak of plant disease in the exporting country or the threat of these events. The New Zealand historian Keith Sinclair gives a graphic account from the New Zealand point of view of the Australian quarantine restrictions on imports from New Zealand of fruit such as apples and citrus, and plants such as potatoes and hops in the 1920s and 1930s (Sinclair 1988).

Our coverage of assistance to agricultural producers in the pre-World War II period is as broad in terms of the measures covered as we could make it; it includes bounties, export bounties, relief assistance, tariffs, the dairy industry arrangements (the Paterson Plan and the relief payments during the 1930s and later price equalisation scheme) and the wheat industry arrangements (the relief payments during the 1930s and the price equalisation scheme that operated from 1939). This account covers all of the major Commonwealth measures except those involving quantitative restriction on trade: the tobacco content plan, the colouring of butter substitutes and, most importantly, the sugar import ban.[5] Financial assistance to agricultural producers through the Commonwealth bearing the losses on various pools for fruit products and guaranteeing the advances to export boards, again mostly for fruits, under the Export Guarantee Act 1924 (see Rural Reconstruction Commission 1946, appendix 2) are also omitted.

Under the Australian constitution, the peacetime powers of the Commonwealth government in relation to rural affairs are limited by Section 51 to matters associated with external trade and the payment of bounties on production and exports and to financial assistance. (For contemporary discussions of the constitutional problems facing the Commonwealth in its attempts to regulate the Agriculture sector, see Copland and Janes (1938, chapter II) and Rural Reconstruction Commission (1946, chapter I).) Some State Governments, most notably Queensland, were more active in assisting agriculture than manufacturing production. They pioneered some of the

[5] From 1941, State Governments imposed quotas on Australian production of table margarine (Drane and Edwards 1961, table 96). As all six States imposed quotas, there was, in effect, a national quota on the production of table margarine. This was a significant trade barrier because butter and table margarine had become close substitutes as the nutritional value and quality of table margarine steadily improved from the products made at the start of Federation from whale oil (see Rural Reconstruction Commission 1946, para 2240).

methods of intervention in agricultural markets; for example, the State Governments of Queensland and New South Wales introduced a home consumption price scheme for dairy products in the 1920s. There had been earlier short-lived home consumption price schemes operated by the Commonwealth for sugar and dried vine fruits (Rural Reconstruction Commission 1946, pp. 163–175).

A general feature of the pattern of assistance to agricultural producers in Australia is the complexity of some of the measures. For some products, the prices received varied greatly among Australian farmers, differing between home and export markets and among States. In industries such as butter, home price schemes – which raised home prices above export and import parity prices – required regulations to prevent import competition. Bounties and tariff rates were all specific with only two exceptions. Hence, ad valorem rates must be calculated for all the covered measures. As a generalisation, the measures that operated to assist agricultural producers were much more complex than the Australian Tariff for import-competing manufacturers.

3.1. Bounties

To begin the quantitative analysis, we report the output-based subsidies paid to agricultural producers during the pre-World War II period in Table A1. Most of the agricultural goods subject to bounties were minor products which were not produced or were produced on a small scale in Australia. The bounties paid under the Bounties Act 1907 for primary products were mostly ad valorem rates at 10 or 20 per cent. All later bounties are specific rates. Each bounty scheme lasted only a few years, with the exception of bounties on cotton which were paid in 19 of the 46 years.[6] Thus only two major agricultural products received substantial assistance by means of bounties – sugar and cotton. Both of these products were produced solely in the state of Queensland.

To be comparable with tariff rates on both agricultural and nonagricultural products, bounty payments need to be converted to ad valorem rates. For the two products subject to bounties and included on our list, these ad valorem rates are reported in Table A2. For each commodity, they were calculated by dividing in each year the value of bounty payments by the value of production and multiplying by 100.

There is considerable year-to-year variability in the ad valorem bounty rates. This occurs because of frequent legislated changes in the specific rates

[6] The cotton bounty paid for the period 1907–1908 to 1915–1916 was a bounty on cotton ginned but the bounty paid over the later period 1926–1927 to 1945–1946 was a bounty on raw cotton (before ginning). This was subject to a requirement that cotton yarn contains 50 per cent Australian cotton. There was also for a period a bounty paid to manufacturers downstream of cotton fabrics which used Australian-grown cotton. White (1934) gives an account of the different bounties applied to the cotton industry.

and in some years limits on the quantities subject to bounties or on the total payments, both of which affect the numerator of the ad valorem rates, and variation in the prices and quantities produced, which affect the denominator. As an example of the complexity of the bounty arrangements, the Raw Cotton Bounty Act 1934 increased the bounty rate substantially from the old rate of ½d (halfpenny) per lb (pound) for higher grade cotton and ¼d (farthing) per lb for lower grade cotton up to 5¼d per lb. This bounty was payable on cotton produced in Australia from Australian-grown seed, but the rate varied according to the Liverpool price of raw cotton and the bountiable quantity was limited to the requirements of Australia plus 20 per cent.

3.2. Tariffs

Next, in Table A3, we estimate the ad valorem equivalent tariff rates in the pre-World War II period for the major agricultural products that were imported and produced in Australia. Four of these commodities are classified as exportables – apples, butter and cheese, dried vine fruits. The ad valorem equivalent rates for each commodity were calculated at the tariff item level by dividing the average duty paid per unit of quantity in the year by the average unit value (price) of imports (before the tariff). Tobacco was one of the largest items of agricultural imports and was produced in Australia. Imported tobacco was subject to tariffs, and tobacco grown in Australia was subject to excise taxation when it was used by manufacturers. Most of the tariff rates on unmanufactured tobacco exceeded the excise rates. Hence, the protective tariff must be defined as the specific tariff duty less the specific excise duty on the corresponding item, expressed in ad valorem terms. However, we were unable to calculate reliable ad valorem equivalent rates of protection for this product. Therefore, tobacco is dropped from the list of covered commodities even though it appears that the excise/tariff system gave substantial assistance to growers of tobacco.

A notable feature of the entries in this table is the year-to-year variability in the columns for each product. There are two sources of variability in these equivalent rates apart from occasional changes in the specific tariff rates themselves. One is shifting from year to year between import sources that have different preferential and non-preferential tariff rates. This causes variability in the numerator of the equivalent rate. The second source is variability from year to year in the denominator, the unit values of the products.

The final column reports the (unweighted) average of the rates across all 44 years for each commodity. While the average for these commodities is substantial, it is less than the average tariff on all dutiable imports (Lloyd 2008, table 5, column 5) in all but 3 years. That is, these agricultural products that were both imported and produced in Australia received less tariff protection than manufactured goods that were imported and produced in Australia.

The final row in Table A3 reports the unweighted average of the rates for all twelve commodities in each year. All of these importable commodities, apart from cotton, received substantial assistance through protective tariffs in this period. Bananas (50.1 per cent), dried vine fruits (42.9 per cent) and cheese (28.7 per cent), in that order, received the highest levels of protection. The average for all entries – all commodities in all years – is 22.9 per cent.

3.3. Export bounties

The fourth measure covered in this section is export bounties. Table A5 lists all payments of export bounties on agricultural products in the period up to the end of World War II. This table excludes the export bounty payments for fortified wine and for combed wool and wool tops, both of which are classified as manufactured goods, although they use products of the Agriculture sector. (In fact, export bounties paid to wine producers dwarf the total export bounty payments to agricultural products.) The first export bounty for the Agriculture sector was that paid to dried fruits from 1907–1908 to 1918–1919. For a few years, an export bounty was paid on beef and live cattle. The export bounties are converted into ad valorem rates of assistance by dividing the value of the export bounty payments by the value of exports of the commodity in the year concerned.

3.4. Dairy industry arrangements

The pre-World War II dairy industry arrangements began with the Paterson Plan for butter, which is covered by the fiscal years 1926–1927 to 1933–1934 (Table A6). Domestic factory butter output was subject to a levy initially of 1½d per lb the proceeds of which were expended on an export subsidy for butter of 3d per lb, later raised to 4½d per lb. The rates of levy and/or bounty were changed eight times over the life of the scheme. (Rural Reconstruction Commission 1946, p. 168 provides a table of the levy and the export subsidy rates.) The levy was voluntary as it was believed the Commonwealth lacked the powers under the constitution to tax production. The production levy–export bounty combination had the effect of maintaining the domestic price at a level equal to the export price plus the export subsidy. The increase in the average price due to the levy-bounty scheme is approximately the difference between the rate of bounty paid on exports and the rate of levy charged on domestic sales. However, under the Plan, it was necessary to protect the butter sales on the Australian market at higher prices from increased imports. The General tariff rate on butter was raised at the time of the introduction of the Plan from 3d to 6d and then 7d per lb and the Preferential tariff on imports of butter from New Zealand, the dominant supplier before the Plan, was raised from 2d to 6d per lb; as Shann (1948, p. 445) expressed it, 'lest greedy New Zealanders should seek to make profit out of the improved

Australian market'. Imports from New Zealand, which had been running at a level of around 7 million lbs per year before the Plan, ceased from 1928 to 1929. This tariff permitted an increase in the average price greater than the difference between the bounty and the levy. Giblin (1934) concluded that 'For rough purposes, we may say without qualification that the home price raises the price of butter by 6d per lb'. This compares with an increase of 3.4d due to the export bounty during the life of the Plan. The tariff was in fact the binding constraint on the ability of butter producers to raise prices on the domestic market. Consequently, we take the increase in the average price during this period to be 6d less the levy paid each year, an average of 1.6d during the life of the Plan, yielding an average net increase of 4.4d. The difference for each year is converted into an ad valorem rate of assistance by dividing by the export unit price.

The Plan was superseded by a price equalisation scheme which equalised the price to the manufacturers of the prices on the domestic market and the lower price on the export markets. This scheme covered cheese as well as butter from 1934 to 1935 until after the end of World War II. It also permitted price discrimination. There was no subsidy on exports. For the years of the price equalisation scheme, the rate of assistance is taken to be the difference between the overall return on all sales and the average price realised on export sales, expressed as a percentage of the average export price. The rates of assistance to the dairy industry during the Paterson Plan and price equalisation periods are reported in Table A6.

3.5. Wheat industry arrangements

The pre-World War II assistance to the wheat industry began with relief payments to the industry during the Great Depression. This assistance lasted from 1931 to 1932 until after the end of World War II. (The various Acts providing relief, payment of bounties and the flour tax are conveniently collected in Copland and Janes (1938, pp. 296–305).) The payments were made in the first 2 years on the basis of acreage planted but, from 1934 to 1935, the bounty payments were in the form of a bounty of 3d per bushel. The bounty payments were financed by a tax on the domestic consumption of flour, as recommended by the Royal Commission on the wheat industry, which varied inversely with the price of flour. However, 85 per cent of relief assistance was financial assistance and drought relief. Consequently, these relief payments are treated as an output subsidy. After the outbreak of war, the Wheat Board was formed and assistance continued to be granted to the industry under a price equalisation scheme. In its outline of the history of wheat industry stabilisation in Australia, the Rural Reconstruction Commission noted 'For the past fifteen years the wheat industry has been the chief problem-child of Australian agriculture' (Rural Reconstruction Commission 1946, appendix 3). Relief assistance to the wheat industry is reported in Table A7.

4. Product-level measures of assistance

The next step is to combine all six covered measures of assistance into a single measurement for each commodity of the percentage deviation of the Australian producer price from the world price. In most cases, an assisted commodity is subject to assistance from only one covered measure. However, in the list of importables, cotton is subject to tariffs and to bounties in some years. Ad valorem equivalent rates of bounties and tariffs are additive and are therefore combined for cotton. For the exportables, butter and cheese, the earlier period when tariffs were the principal form of assistance is linked to the period when the industry assisted in some years by home price schemes and by relief assistance.[7]

Tables S1 and S2 report the nominal rates of assistance for the exportable and the importable commodities, respectively. The row average is the production-weighted average for the year (with production measured at unassisted value) and the column average is the unweighted average across all years for the commodity. Figure 2 graphs the averages for the groups of exportables and importables and the weighted average for all covered commodities. The weights used in Tables S1 and S2 and Figure 2 are current period weights for the years from 1925 to 1926. Statistics for the current value of production for some of the commodities are not available, however, for the years from 1903–1904 to 1924–1925, so we have used the average weights for the first 3 years of current period weights, 1925–1926 to 1927–1928, for all commodities for the years prior to 1924–1925.[8]

In the table for the exportables, wool, the largest export commodity by far, was unassisted throughout the pre-World War II period. As Copland and Janes (1938, p. xviii) observed, 'The wool industry of Australia remains the one great opponent to government interference.' Similarly, producers of sheepmeat, barley, oats and rice received no direct assistance from the Commonwealth throughout the period. Beef received a small amount of assistance in 3 years only when an export bounty applied. Wheat received no Commonwealth assistance until the Great Depression devastated the industry and the assistance it received thereafter averaged <10 per cent in ad valorem terms. Sugar received substantial assistance only in the 12-year period of subsidies after Federation (but this does not include the benefits of the ban on sugar imports from 1923). Apple growers were lightly assisted, the average over the 42-year period being

[7] In the tariff period assistance is related to the import parity price whereas in the period of the Paterson Plan and the equalization scheme it is related to the export parity price. The import parity price is consistently higher than the export parity price; Drane and Edwards (1961) have a long-term series of the export and domestic prices. Consequently, the tariff rates for butter and cheese understate the average increase in the prices received by producers.

[8] For some commodities and for some years, the value of production data is not given in the Commonwealth Yearbooks. Where these data are missing, quantity data were multiplied by unit import or unit export values for importables and exportables, respectively, as an estimate of the missing values.

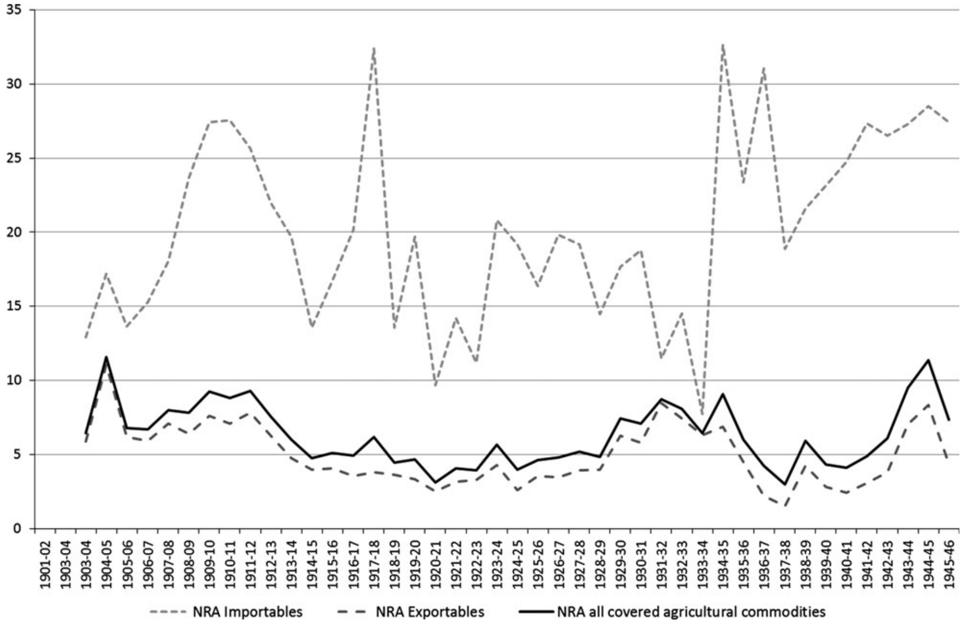

Figure 2 Nominal rates of assistance to agriculture, Australia, 1903–1904 to 1945–1946. Source: Authors' calculations.

<10 per cent (but this does not include the benefits of the ban on imports of apples from New Zealand under quarantine regulations that began in 1921).

Only 5 of the 14 exportable commodities received an average of more than 10 per cent over the whole period; in descending order of the commodity average for the whole period, these were dried vine fruits (44 per cent), cheese (26 per cent), butter (25 per cent), bacon and ham (19 per cent) and pork (16 per cent). Butter and cheese are the most important commodities in this group. Before the Paterson Plan, assistance to butter producers came from tariffs on imports, almost all from New Zealand. When the Paterson Plan came in 1926, the rate of assistance roughly trebled. It then fell sharply when the price equalisation scheme replaced the Plan. In the table for the importables, all commodities received more than 10 per cent on average over the whole period.

Looking at the time series, for the first 20 years of Federation, Australian farm products were unassisted or very lightly assisted with the exception of sugar. Bounties and tariffs to assist agricultural producers were not increased substantially during the Great Depression (see Tables A2 and A3). In this respect, the treatment of the Agriculture sector was very different than that of the Manufacturing sector as many of their tariff rates were increased substantially in the early 1930s. However, very substantial payments were made to some agricultural producers, chiefly wheat growers and the dairy industry, in the form of relief payments from 1931–1932 up to 1944–1945 and in the 3 years after the end of World War II. After the Great Depression, some new measures to assist agricultural producers were introduced. Tobacco growers received high levels of protection from the content plan which operated from 1936 to 1995.

5. The sectoral average

Figure 2 and Table S3 report the series for the average level of assistance to all covered exportables and to all covered importables and to all covered agricultural products for the period up to the end of World War II.

For the exportable commodities as a group, the average nominal rate of assistance is just below 5 per cent. This is partly due to a majority of the commodities receiving no or very little assistance and partly to the larger weight of this group, especially wool. The average level of assistance for all exportable commodities was remarkably stable, fluctuating around 5 per cent with no significant trend.

For the importable commodities as a group, the average over all years was just over 20 per cent. This is four times the average for exportables. Most of this assistance came from tariffs. Although the tariff rates were specific duties which give rise to variable ad valorem equivalent rates, they were a more reliable source of assistance than bounties and industry-specific plans which tended to be switched on and off.

Thus, there is a large difference between the average levels of assistance provided by the Commonwealth Government to exporters as a group and to import-competing producers as a second group. This introduced discrimination among agricultural producers and distorted the allocation of resources within the sector. The average level of assistance across the whole sector is below 10 per cent for all except two of the 42 years.

6. Conclusion

From the time of Federation, producers of some crops and animal products have received assistance from the Commonwealth Government. Our review of the main measures shows how the range of measures to assist farmers and the levels of assistance increased after Federation until the end of World War II. These provided the starting point for the evolution of agricultural assistance policies after the War.

But the commodity coverage of assistance remained spotty and the rates of assistance were generally low. However, the extent of assistance was not known until the quantitative estimates of rates of assistance were provided in this paper. In particular, producers of exportable agricultural products received on average only one quarter of the assistance given to producers of importable agricultural products.

References

Anderson, K., Lloyd, P.J. and MacLaren, D. (2007). Distortions to agricultural incentives in Australia since World War II, *Economic Record* 83, 461–482.

Butlin, N. and Dowie, J. (1969). Estimates of Australian workforce and employment, 1861–1961, *Australian Economic History Review* 9, 138–155.

Commonwealth Bureau of Census and Statistics (1945). *War-time Marketing of Primary Products*. Special article, Year Book No. 36, 1944–45. Commonwealth Bureau of Census and Statistics, Canberra.

Commonwealth of Australia (1935). *Royal Commission on the Wheat, Flour and Bread Industries*. Second Report. Parliamentary Papers 1934–35–36–37, vol. IV. Commonwealth of Australia, Canberra.

Copland, D.B. and Janes, C.V. (1937). *Australian Trade Policy. A Book of Documents 1932–37*. Angus and Robertson, Sydney.

Copland, D.B. and Janes, C.V. (1938). *Australian Marketing Problems. A Book of Documents 1932–37*. Angus and Robertson, Sydney.

Crawford, J.G., Donald, C.M., Dowsett, C.P., Williams, D.B.; and Ross, A.A. (1954). *Wartime Agriculture in Australia and New Zealand 1939–50*. Stanford University Press, Stanford.

Drane, N.T. and Edwards, H.R. (eds.) (1961). *The Australian Dairy Industry*. Cheshire, Melbourne.

Giblin, L.F. (1934). Memorandum: The Home Price and Export Industries. *Royal Commission on the Wheat, Flour and Bread Industries*. Second Report. Parliamentary Papers 1934–35–36–37, vol. IV. Commonwealth of Australia, Canberra. Reprinted in Copland and Janes (1938, 1–8).

Harris, S.F. (1964). Some measures of levels of protection in Australia's rural industries, *Australian Journal of Agricultural Economics* 8, 124–144.

Lloyd, A. (1950). The marketing of dairy produce in Australia, *Review of Marketing and Agricultural Economics* 18, 6–92.

Lloyd, P.J. (1973). *Non-tariff Distortions of Australian Trade*. Australian National University Press, Canberra.

Lloyd, P.J. (2008). 100 Years of tariff protection in Australia, *Australian Economic History Review* 48, 99–145.

Lloyd, P.J. and MacLaren, D. (2014). Relative Assistance to Australian Agriculture and Manufacturing since Federation. *Australian Journal of Agricultural and Resource Economics* (forthcoming).

Rural Reconstruction Commission (1946). *Tenth Report: Commercial Policy in Relation to Agriculture*. Rural Reconstruction Commission, Canberra.

Shann, E.O.G. (1948). *An Economic History of Australia*. Cambridge University Press, Melbourne.

Sinclair, K. (1988). The Great Anzac Plant War: Australian New Zealand Trade Relations, 1919–39, in Sinclair, K. (ed.), *Tasman Relations. New Zealand and Australia, 1788–1988*. Auckland University Press, Auckland, 124–141.

White, T.W. (1934). Fiscal History of Australian Cotton Industry, extract from a speech by the Minister for Trade and Customs, in The House of Representatives, 13 July 1934. Reproduced in Copland and Janes (1938, 514–523).

Supporting Information

Additional Supporting Information may be found in the online version of this article:

Table S1. Nominal rates of assistance to exported agricultural commodities, Australia, 1903–1904 to 1945–1946.

Table S2. Assistance to imported agricultural commodities, Australia, 1903–1904 to 1945–1946.

Table S3. Average nominal rates of assistance to Australian agriculture, 1903–1904 to 1945–1946 (%).

Table A1. Bounty payments for agricultural products (£), 1902–1903 to 1945–1946.

Table A2. Ad valorem bounties for cotton and sugar cane, 1903–1904 to 1945–1946.

Table A3. Ad valorem equivalent tariff rates on selected imports, 1903–1904 to 1946–1947.

Table A4. Implicit ad valorem tariff rates for tobacco, 1903–1904 to 1945–1946.

Table A5. Export bounties on agricultural products (£).

Table A6. Assistance to the dairy industry, 1925–1926 to 1945–1946.

Table A7. Assistance for relief of primary producers.