Distortions to Agricultural Incentives in Australia and New Zealand

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Abstract

In 1990, Australia and New Zealand were ranked around 25th and 35th in terms of GNP per capita, having been the highest-income countries in the world one hundred years earlier. The poor performance over that long period contrasts markedly with that of the past 15 years, when these two economies out-performed most other high-income countries. This difference in growth performance is due to major economic policy reforms during the past two to three decades. We provide new evidence on the extent of governmental distortions to agricultural incentives in particular in the two economies since the late 1940s, both directly and indirectly (and negatively) via manufacturing protection.

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Following its 'Gold Rush' in the 1850s, Australia surpassed Britain in having the highest per capita income in the world, and New Zealand was not far behind. Both suffered from depressions in the 1890s before recovering their equal-first ranking just prior to the World War I, but for the following seven decades their incomes kept falling behind those of the United States and some other developed economies. They recovered briefly in the middle of the twentieth century thanks in part to the Korean war-induced boom in wool prices, when they were ranked equal second after the United States. But since then their rankings have continued to slide as the economies of Western Europe, Canada and Japan grew faster – and Australia and especially New Zealand grew slower – than the United States (Figure 1). By 2004 these two antipodean economies were ranked 25th and 37th respectively, according to the World Bank Atlas method of measuring GNP per capita (World Bank 2006). By that standard at least, the long-term economic performance of both the Australian and New Zealand (ANZ) over the one hundred years to the 1970s has to be described as relatively poor.

During the past two decades, by contrast, these two small economies (with just 20 and 4 million people, respectively) out-performed most other high-income countries, with their per capita incomes growing half as fast again as the OECD average.

This marked difference between these countries' recent and earlier relative performances is due to major economic policy reforms during the past two to three decades and in particular the belated opening of the ANZ economies first to each other and then to the rest of the world. Having been more protectionist than all other OECD countries for most of the twentieth century (Anderson and Garnaut 1987), and having stood aside from the industrial trade policy reforms agreed to by other Contracting Parties

to the General Agreement on Tariffs and Trade (GATT) in the first seven rounds of multilateral trade negotiations (1947 to 1979), Australia and New Zealand have undergone a remarkable degree of opening up of their current and capital accounts from the 1980s. This has reversed the downward trend in their trade share of GDP, although no more so than for other OECD countries (including the United States, whose share has trebled in the past three decades); and it has accelerated the downward trend in their average import tariff (Figure 2). The fact that this was accompanied by many domestic micro- and macro-economic reforms, and coincided with a long period of rapid global economic growth that was stimulated by the information and communication technology revolution and by the opening up of nearby resource-poor countries in East Asia, added to the scope for boosting gains from freeing their international trade and investment and floating their currencies.

Another difference between the ANZ economies and most other OECD countries is that they are relatively well endowed with agricultural land per worker. This provides them with a strong comparative advantage in agricultural products. This is especially strong for New Zealand which, unlike Australia, is not also blessed with an abundance of mineral and energy resources. Trade protectionism in these economies thus meant restrictions on imports of manufactures, making their trade policy regime more like those of developing countries. True, in some decades they also had periods of agricultural subsidies, but overall the trade policy regime in both countries has involved an anti-agricultural bias. The fact that those agricultural subsidies have been virtually eliminated over the past two decades also makes Australia and New Zealand an interesting political economy study, given the extreme difficulties other OECD countries have had in reforming their farm support programs (see Gardner 2007, Josling 2007, and Hayami and Honma 2007).

This chapter examines the extent to which that anti-agricultural bias has changed in these two countries since World War II, and the forces behind the policy evolution in each case. It begins by summarizing the structural changes that have accompanied their economic growth since the 1950s. It then describes the emergence/build-up of first manufacturing protection and then some agricultural subsidies, and then after the 1970s the dramatic dismantling of those interventions. This is done by compiling a new time

series of nominal rates of protection for both agriculture and manufacturing, stretching back to the mid-1940s for Australia and to the mid-1950s for New Zealand. The reasons for these policy choices are then explored, dealing with first the gradual growth in market interventions to the 1970s and then their relatively rapid dismantling. The chapter concludes by discussing prospects for further policy reform and lessons for both other high-income countries and resource-rich developing economies.

Growth and structural changes since 1950

The comparatively poor growth performance of the ANZ economies for most of the twentieth century contrasts with that since the late 1980s, when they out-performed many other advanced economies in terms of GDP per capita growth (World Bank 2006). This was a period of especially rapid total factor productivity (TFP) growth in Australia (Parham et al. 1999, Dowrick 2001), in contrast to Britain where much of its catch-up has been due to growth in employment and hours worked per worker (Card and Freeman 2002). A survey by Parham (2004) reports that Australia's annual TFP growth rate accelerated a full percentage point during the 1990s. Since that was not the experience of other OECD countries, he asserts that domestic factors must provide a major part of the explanation, an important one being the greater openness of the economy to trade and investment.

A more recent econometric study by Diewert and Lawrence (2006) demonstrates that productivity growth has been the dominant contributor to the growth in real welfare in Australia since 1960, with the terms of trade playing only a very minor role. Certainly prices in international markets for primary products relative to manufactures have been on a downward trend over the past century, but the decline has averaged less than 0.5 percent per year (Appendix Figure 1).

The difference between these economies' recent and earlier relative performances is due very substantially to their economic policy reforms of the past three decades. The belated freeing of markets in these two economies not only has arrested the decline in

their per capita income ranking, but also is having a remarkable influence on their patterns of production and trade.

For these natural resource-rich, relatively lightly populated economies,[1] the most appropriate theory of comparative advantage is a blend of two core models developed in the 20th century: the Heckscher-Ohlin-Samuelson model which assumes all factors of production are mobile between sectors, and the Ricardo-Viner model which assumes some factors are sector-specific. Such a blend is provided by Krueger (1977) and explored further by Deardorff (1984). They consider two tradable sectors each using intersectorally mobile labour plus one sector-specific factor (natural-resource capital or industrial capital). Assuming that labour exhibits diminishing marginal product in each sector, and that there are no services or nontradables and no policy distortions, then at a given set of international prices the real wage is determined by the aggregate per worker endowment of natural-resource and industrial capital. The commodity composition of a country's trade – that is, the extent to which a country is a net exporter of primary or industrial products – is determined by its endowment of natural relative to industrial capital compared with that ratio for the rest of the world.

Leamer (1987) develops this model further and relates it to paths of economic development. If the stock of natural resources is unchanged, rapid growth by one or more economies relative to others in their availability of industrial capital per worker would cause those economies to strengthen their comparative advantage in non-primary products. On the other hand, a discovery of minerals or energy raw materials would strengthen that country's comparative advantage in mining and weaken its comparative advantage in farm and other goods, ceteris paribus. It would also boost national income and hence the demand for nontradables, which would cause mobile resources to move into the production of nontradables, further reducing farm and industrial production (Corden 1984).

Domestic or foreign savings can be invested to enhance the stock and/or improve the quality not only of industrial capital but also of labour or natural resources, and to

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[1] New Zealand has around five times the global average of both agricultural land per capita and arable land per worker, and Australia has around twenty five times as much (Sandri, Valenzuela and Anderson 2006). Of course the quality of farm land and associated water, rainfall, sunshine, etc. also matter, but even adjusting for these leave ANZ as relatively very well endowed in agricultural resources per worker.

provide capital to the nontradables sector. Any such increase in the net stock of produced capital per worker will put upward pressure on real wages. That will encourage, in all sectors, the use of more labour-saving techniques and the development and/or importation of new technologies that are less labour intensive.

Which types of capital would expand fastest in a free-market setting depends on their expected rates of return. The more densely populated, natural resource-poor a country, the greater the likelihood that the highest payoff would be in expanding its capital stocks for non-primary sectors. At early stages of development of such a country with a relatively small stock of natural resources per worker, wages would be low and the country would have a comparative cost advantage in unskilled labour-intensive, standard-technology manufactures. Then as the stock of industrial capital grows, there would be a gradual move toward exporting more capital- and skill-intensive manufactures. Natural resource-abundant economies such as Australia and New Zealand, however, would develop a comparative advantage in manufacturing at a late stage of development, and their industrial exports would be relatively capital intensive. And with New Zealand's lesser mineral and energy resources per worker and poorer climatic conditions for broadacre cropping than Australia, its agricultural comparative advantages would be stronger in aggregate but less focused on cereal and oilseed cropping than Australia's.

The above theory of changing comparative advantages has been used successfully to explain the evolving pattern of exports of Australia and its Asian trading partners (Anderson and Garnaut 1980, 1987; Anderson and Smith 1981; Anderson 1995), and is also consistent with New Zealand's trade pattern. It can be used also to explain shocks to that evolutionary pattern, as with mining booms. And it is consistent with the larger shares of farm revenue (at unassisted prices) from livestock and horticultural crops compared with grains, oilseeds, sugar and cotton for New Zealand relative to Australia, as reported in Appendix Figure 2.

But the evolving pattern of a country's production and trade specialization also depends on policy choices and their changes over time. In the ANZ cases, their long history of industrial protectionism (reflected in the relatively high implicit tariffs) resulted in a smaller share of GDP traded than would be normal for economies of their

size (Figure 2).[2] It also ensured a bigger manufacturing sector than would have emerged under free trade, which was possible in their full-employment setting only at the expense of other sectors. The sectoral shares of GDP by the early 1960s were close to the OECD average of around 30 per cent, even though Australia and New Zealand have always been lightly populated and so have a weak comparative advantage in manufactures.

The removal of the ban on key mineral raw material exports in the early 1960s and the tariff reforms of the 1970s and 1980s corrected that distortion for Australia. Between 1960 and 2005, manufacturing's share of GDP fell much more rapidly for Australia than for the average OECD country, to just 11 per cent, while the mining sectors share initially trebled (Table 1a).

Mining's share of Australian exports more than trebled between the early 1960s and early 1980s (Table 1a), helped of course by the dramatic rises in energy raw material prices in second of those decades.[3] And even though that lowered agriculture's *relative* contribution, the share of exports in the gross value of farm production increased considerably, from around 55 to 75 percent since the mid-1970s (Figure 3). Moreover, that growth in farm exports came from an increasing range of farm products, as farmers diversified away from the traditional wheat and sheep enterprises to beef, cotton, sugar, dairy products, wine, and rapeseed (Appendix Figures 3 and 4).

It was not only natural resource-based exportables that Australia's protectionism had discouraged, however. Also discouraged were export industries *within* the manufacturing sector, as well as services exports. Together those two sectors contributed only one-twelfth of Australia's exports in the early 1950s. Even by 1980 their contribution was barely above one-quarter, but by 1990 it had risen to one-third and by 2005 to 44 per cent or 22 per cent each, thus each surpassing the 21 per cent share for agriculture for the first time (Table 1a).

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[2] In terms of population, Australia is somewhat smaller than Argentina and Canada but similar in terms of arable land, and New Zealand is similar in population, arable land and other agricultural attributes to the average of the Nordic countries. But the antipodean location of Australia and New Zealand compared with those other countries leads one to expect them to have traded less (and be specialized in more storable and less bulky exports) than these comparator countries, at least prior to East Asia's trade-led growth takeoff.
[3] Mining was also an important export earner for Australia in the latter half of the nineteenth century, but due almost entirely to gold. Gold's share of total exports was 49 percent in 1861, and while it fell to about one-sixth in the 1980s it returned to 28 percent in 1900. During the 1961-90 period, wool plus gold accounted for almost three-quarters of all exports (Butlin 1962).

The transformation in New Zealand was in some ways similar, except it did not have the mineral resources to enjoy a mining boom. Furthermore, it was affected relatively much more than Australia by the coming into force from 1983 of the Australia New Zealand Closer Economic Relations Trade Agreement (ANZCERTA): its lower wages allowed it to rapidly expand exports of manufactures and services to the much bigger Australian economy under that preferential arrangement. Together with the virtual elimination of its manufacturing protection these forces brought to a halt the decline in agriculture's share of New Zealand's GDP, in fact raising it from its low of 7 per cent in the latter 1980s to 9 percent in the early 2000s – notwithstanding the abolition of non-trivial agricultural subsidies in the 1980s. Over that same period the share of food and agricultural products in New Zealand's exports have fallen somewhat to the benefit of other manufactures and services (Table 1b).

Policy evolution

This section begins with a brief history of policies up to the early 1970s, then the changes in the next dozen years before the reforms accelerated in the mid-1980s. Since there were relatively few agricultural subsidies or farm import barriers (other than quarantine restrictions) through most of the past century, the story in both countries is more about the *indirect* anti-agricultural bias that resulted from protection of manufacturing. Nonetheless, we also include coverage of policies that directly distorted various agricultural markets post-World War II.

We know that it is *relative* prices and hence relative rates of government assistance that affect incentives. In a two-sector model an import tax has the same effect on the export sector as an export tax (the Lerner Symmetry Theorem), and this carries over to a model that also includes a third sector producing only nontradables (Vousden 1990, pp. 46-47). For that reason we report the average nominal rate of assistance (NRA) for the tradable parts of the agricultural sector, based on NRA estimates for individual agricultural industries, plus the average NRA for the tradable parts of all non-agricultural

sectors. The NRA is the equivalent of the percentage by which government policies have raised the producer price above what it would be without the government's intervention.[4] With those two sectoral NRAs we then calculate a Relative Rate of Assistance, RRA, defined as:

$$RRA = 100[(1+NRAag^t/100)/(1+NRAnonag^t/100) - 1]$$

where $NRAag^t$ and $NRAnonag^t$ are the average percentage NRAs for the tradables parts of the agricultural and non-agricultural sectors, respectively. Since the NRA must be greater than -100 percent if producers are to earn anything, so too must the RRA. The usefulness of this measure is that if it is below zero, it indicates the extent to which the policy regime has an anti-agricultural bias, and conversely when RRA is positive.

Prior to the early 1970s

The long history of ANZ industrial protectionism has its roots in the formation in 1901 of the Australian Federation – which New Zealand decided not to join but instead became separately independent of Britain. Tariff revenue then accounted for almost one-fifth of government revenue in both countries. That is very high for what at the time were the world's highest-income economies, since that share typically falls as per capita income rises. It is twice that of the Nordic countries, for example, even though their per capita incomes were barely half ANZ ones (Figures 1 and 2a). Tariffs on manufactures rose steadily in the decades that followed. They were supplemented by quantitative import restrictions first imposed in 1939, and then rose even further in the 1960s when they substituted for the import licences as the latter were removed (in 1960, with minor exceptions, in the case of Australia).[5] This trend over the 1950s and 1960s contrasted strongly with what other high-income countries were doing at that time, which was

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[4] It is thus a generalization of the nominal rate of border protection due, for example, to an import tariff, which is the percentage by which the domestic price is raised above the import unit value.

[5] The first major tariffs for the Australia federation were imposed in 1907. According to the indexes constructed by Carmody (1952), by the 1920s the decade average of the general tariff on Australia's imports of items other than food beverages and tobacco was double that 1907 level, and by the 1930s it averaged 60 percent higher than in the 1920s. Vernon (1965) reports averages for tariffs above 12.5 percent for the period from 1938-39 to 1962-63: they dipped a bit in the late 1940s/early 1950s when import licences became the binding constraint but by the early 1960s they were back to the level of the late 1930s. The annual average level of protection since World War 2 is indicated by the carefully constructed customs duty rates in Appendix Table 3.

lowering tariffs on manufactures as part of multilateral trade negotiation under the General Agreement on Tariffs and Trade (GATT).[6] Hence by the early 1970s the average ANZ manufacturing tariff exceeded that of any other OECD country (Anderson and Garnaut 1987).

Meanwhile, the ANZ governments intervened in numerous markets for farm products, but the subsidies and protection they provided to agricultural industries was only a modest offset to the indirect disincentives caused by manufacturing protection during this era. In the immediate post-World War II period, Australia's agricultural programs were directly taxing the farm sector. Most of that was removed by the end of the Korean War, at which time farmers were enjoying a boom in export prices that spurred the highest inflation in Australia since its gold-rush era of the 1850s. Farm assistance then rose gradually such that by the end of the 1960s the nominal rate of assistance averaged 17 percent in Australia, whereas in New Zealand it averaged little more than 2 percent until the mid-1970s (Tables 2 and 3 and Appendix Tables 4 and 6).

A striking feature of Australia's agricultural assistance at that time (and of New Zealand's when it increased assistance to livestock products for a dozen years from 1975) was that it applied to export industries as much as to import-competing ones (Figure 4). Export industries in Australia such as wheat, manufactured dairy products, sugar and dried vine fruit were assisted by so-called price stabilization schemes, although they often also contained so-called home consumption price schemes whereby domestic consumers were forced to pay more than the export price (Sieper 1982, Edwards 2006). These schemes, which required the pooling of domestic and export returns, could only be implemented with the support of the Australian state governments.[7] Other policy measures included fertilizer subsidies, income tax incentives, rural credit measures,

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[6] The GATT came into effect in 1948. Even though Australia and New Zealand were founding signatories to that agreement, they both chose not to join the commitments to cut manufacturing tariffs – out of frustration with the unwillingness of other GATT contracting parties to commit to lowering their agricultural protection rates (Arndt 1965, Snape 1984, Capling 2001).

[7] That pooling was inefficient in at least two senses: it led to excessive volumes of production because producers received the average rather than the marginal price; and because there was little differentiation in terms of quality and variety, producers were discouraged from seeking out niche markets by differentiating their product. Additional stabilization schemes were implemented by individual states, such as for fresh milk and eggs, and these led to different incentives in the various states. These were possible only by the states agreeing not to trade across state borders, in contravention of Section 92 of the Constitution which says there shall be no barriers to interstate trade.

involvement in and subsidies to agricultural research and extension, and public investment in land and water development and rural infrastructure – but all those measures combined added the equivalent of no more than 2 percent to farmers' gross income as of the early 1970s.

The net effect of both farm and nonfarm policies on agricultural incentives is summarized in Figure 5 and the final column of Appendix Tables 4 to 6. For Australia, the negative effect on incentives from agricultural policies in the 1940s was trivial compared with that from non-agricultural ones, mostly import protection for manufacturers: together those policies effectively reduced farmers' gross returns by more than 20 percent. The price stabilization and other agricultural policies gradually provided more direct assistance to Australian farmers over the 1950s and 1960s when manufacturing protection remained steady, so that degree of taxation fell from 20+ percent to just 4 percent by 1971-72. New Zealand farmers, meanwhile, were effectively taxed an average of over 20 percent right through to 1972-73. The ANZ experience to the early 1972s was thus very similar to the degree of anti-agricultural bias in many developing countries in those decades.

Meanwhile, by the late 1960s the home consumption price schemes were imposing tax equivalents of over 100 percent on Australian consumers of butter, cheese, sugar and eggs (Appendix Table 7). These distortions are unusual in that the imposition they imposed on consumers or users of exportables was greater than the price impact on producers – something that does not arise from standard trade barriers.

The reforms from the early 1970s

Disenchantment with the interventionist trade and related economic policies gradually spread in the 1960s, but it was not until the 1970s that major tariff reductions began. In Australia a 25 per cent across-the-board cut in July 1973, preceded by some minor cuts in 1970-71, started the tariff reform process. It was accelerated in the 1980s and continued through the 1990s. As a result, the average nominal rate of assistance to Australian manufacturing fell from 23 to 3 percent, and the effective rate from 36 to 5 per cent over those three decades. In the 1990s alone, both the mean and the standard deviation of

Australia's import tariffs on goods halved. This brought the average tariff for manufactures down to 4.2 per cent in 1999.[8] The only manufacturers with significant tariff protection now are motor vehicles and parts, and textiles, clothing and footwear. Excluding them, the average effective rate of assistance to Australian manufacturing is just 3 per cent (Productivity Commission 2000a).[9]

Australia's agricultural subsidies and regulatory interventions also have been close to eliminated over those 35 years. The average nominal rate of assistance to the farm sector has fallen from 16 per cent in the early 1970s to less than 2 per cent this decade. The process was piecemeal[10] and gradual, often involving a series of partial steps, but it was persistent. It began in 1972 with manufacturing milk and then two to four years later with cotton and tobacco, while it took another decade before supports for rice and eggs began to be dismantled, and almost a further decade for cuts to grape industry assistance. And it was not without at least one significant reversion, with the introduction of the reserve price scheme for wool in 1973 that took until the early 1990s to unravel.[11] There were just two farm groups still benefiting significantly from government programs in the latter 1990s: tobacco and milk producers, each with an NRA of more than 20 percent in 1997. Deregulation of tobacco marketing arrangements began in 1995 and was completed in 2000, bringing effective assistance to tobacco growing down from 30 to 2 per cent over that period. As from 1 July 2000, the remaining impediments to a free domestic market in fluid milk began to be dismantled, for which

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[8] This is still higher than for other OECD countries though (World Bank 2006). And WTO-bound tariffs average more than twice the applied rates. However, Australia uses non-tariff import barriers less frequently than other OECD countries, apart perhaps from anti-dumping duties (Productivity Commission 2000a, 2000b, 2004).

[9] Tariffs on motor vehicle imports fell from 40 to 15 per cent over the 1990s and were cut again to 10 per cent in 2005; for clothing the decline over the 1990s was from 55 to 25 per cent, and for footwear from 45 to 15 per cent, with cuts to 17.5 and 10 per cent in 2005, respectively Further cuts, to as little as 5 percent, are scheduled for 2010 (Productivity Commission 2000a, Table 4.4).

[10] By contrast, the reductions in manufacturing protection were more systematic: the 1973 across-the-board tariff cut, a Tariff Review program begun in 1971 by the Tariff Board and subsequently conducted by its successors (the Industries Assistance/Industry/Productivity Commission), and the pre-announced phased reductions in tariffs on textiles, clothing footwear and motor vehicles and parts from 1988.

[11] This stabilization scheme operated conservatively for 15 years until the government transferred the power to set the reserve price to growers in 1987. Growers promptly raised that reserve price – which operated on the world market – by 71 percent. Predictably this encouraged growers to expand wool production and international buyers to reduce purchases (since the Australian Wool Corporation would then stockpile wool and thereby save the buyer the cost of storage). The scheme collapsed in 1991 and the AWC had to dispose of its 4.75 million bales, at some expense to the government and at great expense to woolgrowers (Richardson 2001).

compensation to dairy farmers has been paid over the eight years to 2008 (as provided also to tobacco producers in the late 1990s). In the case of dairy, this compensation was funded by a consumer levy at the retail level

In New Zealand, the anti-agricultural bias declined first by a one-third reduction in import tariffs protecting manufacturing in the latter 1960s/early 1970s and then by a big boost to beef, sheep and dairy farmer assistance from 1975. In these two steps the effective taxation of agriculture (the negative of the Relative Rate of Assistance) fell from 22 to 14 and then to less than 7 percent. It fell further over the next dozen years as agricultural assistance increased slightly while manufacturing protection continued to fall slightly, then it rose a little from the late 1980s as assistance to farmers fell faster than that to manufacturing, and finally it fell to just 1 percent as the last of the interventions were removed from the late 1990s (Figure 5).

Thus distortionary government assistance to both manufacturing and agriculture, and hence the overall anti-agricultural bias, has now all but disappeared in both Australia and New Zealand – after being in place for more than seven decades.[12] Farmers also have benefited from the fact that service sectors too have not been spared reform in these countries. Banking, post and telecommunications, ports, higher education, health, and rail, air and sea transport have been opened up; there has been progressive out-sourcing of many government services; and substantial reforms to competition policy and practice, including privatization and the corporatization and de-monopolization of numerous government enterprises, are well advanced.[13] Moreover, by 1983 the currency was floating and foreign investment flows began to be freed up in both countries. That complemented financial sector reform and contributed to foreign direct investment, equity and foreign currency transactions growing at several times the pace of GDP. Even

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[12] Effective assistance to the mining sector is still slightly negative, as it was two decades ago (Industry Commission 1992, Appendix K; Productivity Commission 2004, Chapter 2.5), although that will be less so when the government eases the current quantitative restrictions on exports of uranium and its derivatives.

[13] In addition, a comprehensive program of review of government regulations at all levels in Australia has been under way since the mid-1990s, with the aim of reducing/removing regulations that unjustifiably impede economic activities (Productivity Commission 2000b). For an early assessment of Australia's domestic microeconomic reforms, see Forsyth (1992, 2000). All Productivity Commission reports on the myriad reforms are downloadable at www.pc.gov.au. Recent research on barriers to trade in a wide range of services in almost 40 countries found that services markets in Australia, relative to those in the other countries in the study, are now ranked as either very liberal (banking, distribution services, telecoms, engineering professional services) or moderately restrictive (other professional services, maritime services) – see Productivity Commission (2000c, pp. 50-61).

the previously highly unionised labour markets have undergone considerable reform. Households have gained substantially from these widespread reforms, including consumers of food who for most of the past two decades have faced tax equivalents of well below 10 percent on their food purchases (compared with the OECD average of between 23 and 36 percent over that period – see Appendix Table 8 and OECD 2006).

Reasons behind the policy evolution

[To be added]

Prospects for further policy reform

Notwithstanding the huge amount of ANZ reform over the past two decades, plenty of agricultural policy issues remain on the table. The key ones are in the resource and environmental areas. Three are mentioned briefly, by way of illustration.

The first is food and agricultural import restrictions for the protection of plant, animal and human health. The economic protection from import competition that this provides farmers has not been fully captured in the Productivity Commission's NRA estimates, especially for horticultural products. Some of that protection may well be warranted on externality grounds, but some (such as a complete ban on imports of certain fruits from all countries) may be excessive from a national welfare viewpoint. The government is slowly examining whether various measures are excessively restrictive, but mainly in response to pressure from other WTO members seeking greater market access. Typically consumer costs are not included in such assessments, nor are all the cheaper ways of reducing any costs associated with the importation of disease (James and Anderson 1998). New Zealand in particular would be a beneficiary of a more-liberal quarantine policy regime in Australia, for example as an exporter of apples.

Second, both Australia and New Zealand have so far not allowed the growing of genetically modified (GM) varieties of farm products, with the sole exceptions of cotton and carnations in Australia, and GM food can be sold only if strict labelling standards are adhered to (FSANZ 2007). This may or may not be in their economies' and consumers' interests depending on its impact on market access abroad for ANZ farm products and on human health and the environment at home (Anderson and Jackson 2005), but emotion has played more of a role in formulating these policies than has sound technical and economic analysis.

Third, water policy was already becoming a major economic and political issue but was brought to a head in Australia following the country's worst drought on record in 2006. There has been substantial reform in recent years. Much remains to be done to make the most of this resource, particularly in rural Australia where the majority of it is used but proposals for reform and several national enquiries are under way (see, e.g., Productivity Commission 2006). More-efficient pricing of that resource may lead to substantial reallocations of resources within the agricultural sector, with possible declines in Australian production of cotton, rice, and milk as horticultural industries (and urban areas) bid away water from those farmers.[14]

The remaining big frontier for policy reform that would boost farm incomes in Australia and New Zealand is the dismantling of agricultural subsidies and import protection abroad. The WTO's Doha round provides the greatest promise for achieving that, notwithstanding the current suspension of trade negotiations, and ANZ farmers and the ANZ economies would be among the major beneficiaries of a significant conclusion to that round (Anderson, Martin and van der Mensbrugghe 2006).

Policy lessons for other economies

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[14] The impact of past under-pricing of water for agriculture on farm returns has not been incorporated in the NRA estimates reported in this paper.

By way of conclusion, two lessons are worth emphasizing from the Australia and New Zealand experiences. For agricultural-subsidizing countries, these case studies show that removing even the largest and longest-lasting farm subsidies is possible. Even in Australia's case where that was done by providing generous adjustment assistance, that support was time-bound rather than providing on-going income support, and it was able to be financed simply by delaying the rewards to domestic consumers rather than via outlays from (and hence resistance by) the treasury.

For developing countries still effectively taxing their agricultural sectors, these two case studies offer hope that good policy analysis and advisory institutions can alter the political economy sufficiently to remove that taxation. More than that, the ANZ cases also illustrate the growth dividend that can come from reforming such distortionary policies. Having now dismantled virtually all their import protection and agricultural subsidy policy distortions, and having undertaken major domestic macro- and micro-economic reforms over the past two plus decades, the fruits of that undertaking are beginning to be reaped. The impact on overall living standards was mentioned at the outset, but an indicator within the agricultural sector is the acceleration it has given to farm productivity growth.

It needs to be borne in mind that ANZ farmers have not been immune from the standard 'small farm problem' that requires them to 'get big or get out' as the economy develops. It is true that their farm sizes were large relative to those in most other market economies in the early post-World War II years, and that the 'wool boom' of the early 1950s provided massive incomes for woolgrowers. Nonetheless, as wages grew elsewhere in the economy, the need to adjust was felt strongly in ANZ just as elsewhere (McKay 1967); and it manifest itself in the same way, that is, with farmers funding agricultural research and adapting and adopting the new technologies it generated as appropriate, and with the number of farms and farmers declining steadily to lower the labor intensity of the sector even as output expanded (Appendix Figure 6).

Within that context, the removal of the anti-agricultural policy bias over the past 30 years has, with a not-unexpected delay, boosted the rate of ANZ farm productivity substantially. Figure 6 shows that in New Zealand, TFP growth *slowed* during the dozen or so years of high agricultural subsidies, and only accelerated to its past rate after those

subsidies were removed along with manufacturing protection. This has been reflected in farm land prices: after initially halving when the subsidy cuts were announced in the early 1980s, they more than recovered in real terms by the turn of the century as farmers profitably adjusted to the new deregulated, level-playing-field domestic economic environment (Figure 7).

In Australia, farm multifactor productivity (MFP) growth increased following the international price hikes in 1973-74, but then plateaued during the next decade until the reforms from the mid-1980s began to have their effect (Figure 6). In the 1983-93 period farm MFP grew at just 1.4 percent per year, but during 1993-2000 its growth rate was 4.1 percent (Productivity Commission 2005, p.121). Similar results are reported in Parham (2004): less than 1.5 percent during 1974-88, then 2.6 percent in 1988-93 and 4.3 percent in 1993-98. His estimates show that even that earlier rate of 1.5 percent compares favourably with that for the rest of Australia's economy which was well below 1 percent during 1973-93 (and only 1.8 percent in 1993-98).

Clearly, farmers are capable not only of surviving without subsidies, but of becoming more productive with their removal – and not with any obviously faster rate of decline in the total number of farmers or farms that occurs with normal economic growth (see Appendix Table 6).[15] Certainly it helps if assistance to non-agricultural sectors is cut at the same time, which is relevant for many developing countries (although not for other high-income countries where manufacturing protection rates are already low). But these two case studies contradict one view in the economic growth literature that natural resource abundance (including a comparative advantage in agriculture) is a curse rather than a blessing.[16]

Getting domestic policies right in the resource and environmental area, and securing tariff and subsidy cuts from the Doha Development Agenda, will yield even further productivity growth for farmers in Australia and New Zealand. But those are stories for the future.

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[15] Adjustment has been sharper within individual industries of course, especially those that faced dramatic cuts in subsidies. In the case of the Australian dairy industry, the number of farms halved in the 25 years following the start if its assistance cuts in the early 1970s (Harris 2005a).
[16] On this literature in general and its applicability to Latin America, see Lederman and Moloney (2006). See also Anderson (1998).

References

ABARE (2007), *Australian Commodities Statistics 2006,* accessed at www.abare.gov.au 12 January.

Anderson, K. (1978), "On Why Rates of Assistance Differ Between Australia's Rural Industries", *Australian Journal of Agricultural Economics* 22(2): 99-114, August.

Anderson, K. (1981), "The Political Market for Government Assistance to Australian Manufacturing Industries", *The Economic Record* 56(153): 132-44, June.

Anderson, K. (1987), "Tariffs and the Manufacturing Sector", Ch.7 in *The Australian Economy in the Long Run*, edited by R. Maddock and I. McLean, Cambridge and New York: Cambridge University Press.

Anderson, K. (1995a), "Lobbying Incentives and the Pattern of Protection in Rich and Poor Countries", *Economic Development and Cultural Change* 43(2): 401-23, January.

Anderson, K. (1995b), "Australia's Changing Trade Pattern and Growth Performance", Ch. 1 in *Australia's Trade Policies*, edited by R. Pomfret, London, Melbourne and New York: Oxford University Press.

Anderson, K. (1998), "Are Resource-Abundant Economies Disadvantaged?" *Australian Journal of Agricultural and Resource Economics* 42(1): 1-23, March.

Anderson, K. (2001), "Australia in the International Economy", Ch. 2 in J. Nieuwenhuysen, P.J. Lloyd and M. Mead (eds.), *Reshaping Australia's Economy: Growth with Equity and Sustainability*, Cambridge and New York: Cambridge University Press.

Anderson, K. (2003), "International Trade and Industry Policy", Ch. 10 in *The Cambridge Handbook of Social Sciences in Australia*, edited by I. McAllister, S. Dowrick and R. Hassan, Cambridge and New York: Cambridge University Press.

Anderson, K. and C. Findlay (1995), "Policies Affecting Primary Sectors", Ch. 3 in *Australia's Trade Policies*, edited by R. Pomfret, London, Melbourne and New York: Oxford University Press.

Anderson, K. and R. Garnaut (1987), *Australian Protectionism: Extent, Causes and Effects*, Boston, London and Sydney: Allen and Unwin.

Anderson, K. and Y. Hayami (1986), *The Political Economy of Agricultural Protection: East Asia in International Perspective*, Boston, London and Sydney: Allen and Unwin.

Anderson, K. and L.A. Jackson (2005), 'GM Crop Technology and Trade Restraints: Economic Implications for Australia and New Zealand'**,** *Australian Journal of Agricultural and Resource Economics* 49(3): 263-81, September.

Anderson, K., R. Lattimore, P.J. Lloyd and D. MacLaren (2007), "Distortions to Agriculture in Australia and New Zealand", spreadsheet downloadable at www.worldbank.org/agdistortions.

Anderson, K., W. Martin and D. van der Mensbrugghe (2006), 'Distortions to World Trade: Impacts on Agricultural Markets and Incomes', *Review of Agricultural Economics* 28(2): 168-94, Summer.

Anderson, J.E. (1995), "Tariff Index Theory", *Review of International Economics*, June, 156-73.

Anderson, J.E. and J.P. Neary (1994), "Measuring the Restrictiveness of Trade Policy", *World Bank Economic Review* 8: 151-69.

Balderstone, J.S. *et al.* (1982), *Agricultural Policy: Issues and Options for the 1980s,* Working Group Report to the Minister for Primary Industry, Canberra: AGPS.

Capling, A. and B. Galligan (1992), *Beyond the Protective State: The Political Economy of Australia's Manufacturing Industry Policy,* Cambridge: Cambridge University Press.

Carmody, A. T. (1952), "The Level of the Australian Tariff: A Study in Method", *Yorkshire Bulletin of Economic and Social Research* 4: 51-65, January.

Crawford, J. G. (1939), "Tariff Level Indices", *Economic Record* 11: 213-221.

Committee of Enquiry (The Vernon Committee) (1965), *Report of the Committee of Enquiry*, Melbourne: Wilke and Co.

Davis Report (1990), *Review of the Commonwealth Primary Industry Statutory Marketing Authorities*, Report to the Minister for Primary Industries and Energy, Canberra: AGPS.

Diewert, W.E. and D. Lawrence (2006), *Measuring the Contributions of Productivity and Terms of Trade to Australia's Economic Welfare*, Consultancy Report, Canberra: Productivity Commission, March.

Doran, C.R. (1984), 'An Historical Perspective on Mining and Economic Change', pp. 55-84 in *The Minerals Sector and the Australian Economy,* edited by L.H. Cook and M.G. Porter, Boston, London and Sydney: Allen and Unwin.

Edwards, G.W. (1987), "Agricultural Policy Debate: A Survey", *Economic Record* 63: 129-43, June.

Edwards, G.W. (2006), "Fifty Years of Agricultural Policy", presented at the 50th Annual Conference of the Australian of the Australian Agriculture and Resource Economics Society, Sydney, 8-10 February.

Edwards, G.W. and A.S. Watson (1978), "Agricultural Policy", Ch. 4 in *Surveys of Australian Economics, Vol. 1,* edited by F.H. Gruen, London and Sydney: Allen and Unwin.

FSANZ (2007), "Assessing the Safety of New Foods and Technologies"**,** Food Standards Australia New Zealand. Accessed at http://www.foodstandards.gov.au/foodmatters/gmfoods/assessingthesafetyof387.cfm.

Forsyth, P. (ed.) (1992), *Microeconomic Reform in Australia*, London and Sydney: Allen and Unwin.

Forsyth, P. (2000), "Microeconomic Policies and Structural Change", in *The Australian Economy in the 1990s*, edited by D. Gruen and S. Shrestha, Sydney: Reserve Bank of Australia.

Gardner, B. (2007), 'Distortions to Agricultural Incentives in the United States and Canada', Agricultural Distortion Working Paper xx, World Bank, January.

Gerritsen, R. (1992), "Labor's Final Rural 'Crisis'?: Australian Rural Policy in 1990 and 1991." *Review of Marketing and Agricultural Economics* 60 Part I: 95-111.

Godden, D. (1997), *Agricultural and Resource Policy: Principles and Practice*. Melbourne: Oxford University Press.

Gruen, F.H. (ed.) (1978), *Surveys of Australian Economics, Vol. 2,* edited by F.H. Gruen, London and Sydney: Allen and Unwin.

Harberger, A.C. (1959), "Using the Resources at Hand More Effectively", *American Economic Review* 49: 134-46.

Harberger, A.C. (1959), "The Measurement of Waste", *American Economic Review* 49: 58-76, May.

Harris, D. (2005a), *Industry Adjustment to Policy Reform: A Case Study of the Australian Dairy Industry,* RIRDC Publication No. 05/110, Canberra: Rural Industries Research and Development Corporation.

Harris, D. (2005b), *Rural Industry Adjustment to Trade Related Policy Reform,* RIRDC Publication No. 05/173, Canberra: Rural Industries Research and Development Corporation, December.

Harris, D. and A. Rae (2004), 'Agricultural Policy Reform and Industry Adjustment in Australia and New Zealand', paper presented to the IATRC Summer Symposium Philadelphia, 6-7 June.

Harris, S.F. (1964), "Some Measures of Levels of Protection in Australia's Rural Industries", *Australian Journal of Agricultural Economics*, December, 124-44.

Harris, S.F. *et al*. (1974), *The Principles of Rural Policy in Australia: A Discussion Paper*, Canberra: Australian Government Publishing Service.

Hayami, Y. and M. Honma (2007), 'Distortions to Agricultural Incentives in Japan, Korea and Taiwan', Agricultural Distortion Working Paper xx, World Bank, January.

Industries Assistance Commission (1976), *Assistance to Manufacturing Industries in Australia 1968-69 to 1973-74*, Industries Assistance Commission, Canberra.

Industries Assistance Commission (1981), *Manufactured Tobacco*, Industries Assistance Commission, Canberra.

Industries Assistance Commission (1983a), *Assistance to Australian Agriculture*, Information Paper, Industries Assistance Commission, Canberra.

Industries Assistance Commission (1983b), *Australian Tobacco Industry*, Canberra: Industries Assistance Commission.

Industry Commission (1995), *Assistance to Agricultural and Manufacturing Industries*, Canberra: Industry Commission.

Industry Commission (1991), *Statutory Marketing Arrangements for Primary Products*, Report No. 10, Canberra: AGPS, March.

James, S. and K. Anderson (1998), 'On the Need for More Economic Assessment of Quarantine/SPS Policies', *Australian Journal of Agricultural and Resource Economics* 42(4): 525-44, December.

Josling, T. (2007), 'Distortions to Agricultural Incentives in Western Europe', Agricultural Distortion Working Paper xx, World Bank, January.

Lattimore, R. (2006), 'Farm Policy Reform Dividends', Paper presented to the North American Agrifood Market Integration Consortium Meetings, Calgary, 1-2 June.

League of Nations (1927), *Tariff Level Indices*, Geneva: League of Nations.

Lederman, D. and W. Maloney (eds.) (2006), *Natural Resources: Neither Curse nor Destiny,* Stanford: Stanford University Press for the World Bank.

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

Lloyd, P.J. (1975), "Discrimination Against Imports in Australian Commodity Taxes", *Journal of World Trade Law* 9(1): 89-101.

Lloyd, P.J. (1978), "Protection Policy", Ch. 5 in *Surveys of Australian Economics, Vol. 1,* edited by F.H. Gruen, London and Sydney: Allen and Unwin.

Lloyd, P.J. (2006), 'Fifty Years of Trade Policy in Australia', *Economic Papers* 25: 301-313, December.

MacLaren, D. (1992), 'The Political Economy of Agricultural Policy Reform in the European Community and Australia', *Journal of Agricultural Economics* 43(3): 424-39, September.

Maddison, A. (2003), *The World Economy: Historical Statistics,* Paris: OECD Development Centre.

Mauldon, R (1990), 'Price Policy', Ch. 19 in D.B. Williams (ed.), *Agriculture in the Australian Economy*, 3rd edition, Sydney: Sydney University Press.

McKay, D.H. (1967), 'The Small-Farm Problem in Australia', *Australian Journal of Agricultural Economics* 11(2): 33-52.

Mitchell, B.R. (1998a), *International Historical Statistics 1750 to 1993: Europe,* Cambridge: Cambridge University Press.

Mitchell, B.R. (1998b), *International Historical Statistics 1750 to 1993: The Americas,* Cambridge: Cambridge University Press.

Mitchell, B.R. (1998c), *International Historical Statistics 1750 to 1993: Africa, Asia and Oceania,* Cambridge: Cambridge University Press.

OECD (1997), *Agricultural Policies in OECD Countries: Measurement of Support and Background Information*, Paris: OECD.

Parham, D. (2004), 'Sources of Australia's Productivity Revival', *Economic Record* 80(249): 239-57, June.

Piggott, R (1990). "Agricultural Marketing", Chapter 18 in D. B. Williams (ed.) *Agriculture in the Australian Economy*, 3rd edition, Sydney: Sydney University Press, 1990.

Productivity Commission (2000a), *Review of Australia's General Tariff Arrangements*, Canberra: Productivity Commission.

Productivity Commission (2000b), *Regulation and its Review 1999-00*, Canberra: Productivity Commission.

Productivity Commission (2000c), *Trade and Assistance Review 1999-2000*, Canberra: Productivity Commission.

Productivity Commission (2003), *From Industry Assistance to Productivity: 30 Years of 'the Commission'*, Canberra: Productivity Commission.

Productivity Commission (2004), *Trade and Assistance Review 2003-04*, Canberra: Productivity Commission.

Productivity Commission (2005), *Trends in Australian Agriculture*, Research Paper, Canberra: Productivity Commission, June.

Productivity Commission (2006), Productivity Commission (2006), *Rural Water Use and the Environment: The Role of Market Mechanisms*, Canberra: Productivity Commission.

Richardson, B. (2001), 'The Politics and Economics of Wool Marketing, 1950-2000,' *Australian Journal of Agricultural and Resource Economics* 45(1): 95-115.

Sandri, D., E. Valenzuela and K. Anderson (2006) "Compendium of National Economic and Trade Indicators by Region, 1960 to 2004", Agricultural Distortions Working Paper 01, World Bank, Washington DC, at www.worldbank.org/agdistortions

Sieper, E (1982), *Rationalising Rustic Regulation*, Sydney: Centre for Independent Studies.

Vousden (1990), *The Economics of Trade Protection,* Cambridge and New York: Cambridge University Press.

World Bank (2000), *Global Commodity Markets: A Comprehensive Review of Price Forecasts,* World Bank: Washington DC.

World Bank (2006), *World Development Indicators,* World Bank: Washington DC.

WTO (1995), *The Results of the Uruguay Round of Multilateral Trade Negotiations: The Legal Texts*, Geneva: WTO.

Table 1: Sectoral composition of GDP, employment and exports, Australia and New Zealand, 1820 to 2005-06

(percent, at current prices)

(a) Australia

GDP share	Agriculture	Mining	Manufacturing	Services	TOTAL
1820-24	53		4	43	100
1861-64	23	15	13	49	100
1880-84	24	5	24	47	100
1910-14	23	6	23	48	100
1950-54	22	2	29	47	100
1960-64	16	2	28	54	100
1970-74	9	3	26	62	100
1980-84	5	6	20	69	100
1990-94	3	5	15	78	100
2005-06	3	4	11	82	100

Employment	Agriculture	Mining	Manufacturing	Services	TOTAL
1962-63	10	1	26	63	100
1972-73	7	1	24	68	100
1982-83	6	1	19	74	100
1993-94	5	1	14	80	100
2005-06	3	1	10	85	100

Export share	Agriculture	Mining	Other merchandise	Services	TOTAL
1950-51	86	6	3	5	100
1962-63	66	8	13	13	100
1972-73	44	28	12	16	100
1982-83	39	34	11	16	100
1993-94	26	41	14	19	100
2005-06	21	35	22	22	100

Table 1 (continued): Sectoral composition of GDP, employment and exports, Australia and New Zealand, 1820 to 2005-06

(percent, at current prices)

(b) New Zealand

GDP share	Agriculture	Industry	Services	TOTAL
1950-54				100
1960-64				100
1970-74	11	32	57	100
1980-84	9	32	59	100
1990-94	8	25	67	100
1995-99	7	24	69	100
2000-04	9	23	68	100

Employment share	Agriculture	Other primary	Manufacturing	Services	TOTAL
1960-64	14				100
1970-74	12				100
1980-84	11				100
1990-94	10				100
1995-99	9				100
2000-04	9				100

Export share	Agriculture and food	Other primary	Other manufactures	Services	TOTAL
1960-64	83	0	4	13	100
1970-74	70	2	10	18	100
1980-84	58	5	18	19	100
1990-94	50	5	23	22	100
1995-99	47	5	24	24	100
2000-04	44	5	24	27	100

Sources: ABARE (2007), Sandri, Valenzuela and Anderson (2006) and, for Australian GDP prior to the 1960s, Mitchell (1998c) and Butlin (1962).

Table 2: Nominal rates of assistance to selected agricultural industries, Australia, 1946-47 to 2003-04
(percent, for fiscal years starting 1 July)

	1946-49	1950-54	1955-59	1960-64	1965-69	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-03
Exportables												
Rice	-3.2	-1.1	11.4	15.0	14.8	22.0	20.4	15.2	10.6	2.5	2.3	1.7
Wheat	-24.2	-8.4	1.9	6.1	10.1	7.2	-0.4	2.6	3.8	2.1	1.1	0.0
Barley	-14.1	-5.8	4.1	3.1	4.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Oats	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grapes, total	10.5	4.5	5.6	9.7	18.7	39.7	19.2	21.3	18.3	13.3	4.9	0.0
Sugar	-8.2	0.7	12.8	15.9	32.8	7.6	-6.2	4.6	12.4	5.8	1.7	0.0
Cotton	0.8	2.0	26.7	52.1	73.9	53.4	17.6	4.4	2.0	0.0	0.0	0.0
Wool	0.0	0.0	0.0	0.0	0.0	6.0	1.4	1.0	1.0	5.4	0.7	0.0
Beef and veal	0.0	0.0	0.0	0.0	0.0	1.4	1.8	1.4	1.2	0.3	0.0	0.0
Mutton and lamb	0.0	0.0	0.0	0.0	0.4	1.6	1.8	1.4	1.8	0.9	0.0	0.0
Pigmeat	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Milk	2.1	18.7	46.9	43.1	74.5	32.8	35.8	32.2	39.6	23.8	19.3	0.0
Import competing												
Maize	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sorghum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.6	2.0	0.0	0.0	0.0
Oilseeds	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tobacco	0.0	34.2	51.0	46.9	51.3	250.0	122.2	56.4	37.6	48.5	19.8	0.0
Chicken meat	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Nontradables												
Eggs	-1.7	14.7	43.7	61.8	141.2	35.0	26.0	35.8	18.4	3.4	0.4	0.0
Potatoes	0.0	8.0	8.0	8.0	8.0	7.2	7.2	8.0	3.2	0.0	0.0	0.0
Total of covered products	**-7.0**	**1.8**	**7.8**	**8.5**	**12.3**	**8.8**	**4.6**	**5.4**	**5.7**	**4.4**	**2.6**	**0.0**
% coverage	91	84	81	86	87	85	85	86	76	83	80	78

a Weighted averages, with weights based on the unassisted value of production (actual back to 1966, and the average for 1966-69 for earlier years)

Source: Anderson, Lattimore, Lloyd and MacLaren (2007)

Table 3: Nominal rates of assistance to agricultural industries, New Zealand, 1955-56 to 2004-05

(percent)

	1955-59	1960-64	1965-69	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-05
Exportables	**0.2**	**0.2**	**0.3**	**3.7**	**14.5**	**17.0**	**11.4**	**1.1**	**0.7**	**0.6**
Coarse grains	4.0	4.0	4.0	4.0	4.0	4.0	2.2	0.4	0.0	0.0
Fruits and veg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other crops	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Beef and lamb	0.1	0.1	0.3	5.8	16.9	22.4	17.4	1.2	0.8	0.8
Milk	0.2	0.2	0.2	-1.0	16.0	18.0	11.6	1.4	1.0	1.0
Coarse grains	0.0	0.0	0.0	5.0	11.0	19.0	10.2	1.4	1.0	1.0
Import competing	**16.2**	**16.1**	**15.8**	**15.9**	**16.5**	**11.9**	**16.3**	**11.0**	**13.0**	**12.7**
Wheat	0.0	0.0	0.0	0.0	-3.0	-3.4	4.4	0.6	0.0	0.3
Oilseeds	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sugar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Poultry and pigs	24.0	24.0	24.0	24.0	29.6	27.6	32.1	21.8	20.9	17.8
Total of covered products	**2.1**	**2.1**	**2.3**	**5.2**	**14.7**	**16.5**	**11.8**	**1.9**	**1.8**	**1.9**

[a] Weighted averages, with weights based on the unassisted value of production (actual back to 1966, and the average for 1966-69 for earlier years)

Source: Anderson, Lattimore, Lloyd and MacLaren (2007)

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Table 4: Nominal rates of assistance to agricultural relative to non-agric. industries, Australia and New Zealand, 1946-47 to 2003-04
(percent, for fiscal years starting 1 July)

(a) Australia	1946-49	1950-54	1955-59	1960-64	1965-69	1970-74	1975-79	1980-84	1985-89	1990-94	1995-99	2000-03
Covered products	-7.0	1.8	7.8	8.5	12.3	8.8	4.6	5.4	5.7	4.4	2.6	0.0
Non-covered	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
All agric. products[a]	-6.4	1.5	6.3	7.4	10.7	7.6	3.9	4.6	4.4	3.7	2.1	0.0
Non-product specific[b]	0.6	1.2	1.8	2.1	2.0	1.9	1.4	1.1	0.9	0.7	0.8	0.5
Total Agricultural NRA (incl. NPS)	-5.7	2.7	8.1	9.5	12.7	9.4	5.3	5.8	5.3	4.4	2.9	0.5
Import-competing	0.0	3.2	4.1	4.7	5.1	7.7	5.1	3.6	1.4	1.0	0.3	0.1
Exportables	-6.6	1.8	7.2	8.3	11.0	8.5	4.4	5.1	5.5	4.9	3.3	0.4
Nontradables	-1.2	12.6	31.5	41.7	78.1	25.4	19.5	24.2	12.2	1.9	0.2	0.0
Assistance to just tradables:												
All agric. tradables	-6.6	1.0	5.4	6.2	8.8	7.0	3.4	4.0	4.2	3.8	2.2	0.0
All non-ag tradables	28.0	23.5	19.6	20.7	20.7	16.8	12.0	11.1	8.2	5.3	2.6	2.0
Relative Rate of Assistance, RRA[c]	**-26.8**	**-18.1**	**-11.8**	**-12.0**	**-9.9**	**-8.5**	**-7.7**	**-6.3**	**-3.8**	**-1.4**	**-0.4**	**-2.0**
(b) New Zealand *Assistance to just tradables:*												
All agric. tradables	na	na	2.1	2.1	2.3	5.2	14.7	16.5	11.8	1.9	1.8	1.9
All non-ag tradables	na	na	21.3	24.0	34.3	30.0	21.7	20.3	16.6	10.8	6.5	3.7
Relative rate of Assistance, RRA[c]	**na**	**na**	**-15.9**	**-17.6**	**-23.8**	**-19.1**	**-5.7**	**-3.2**	**-4.2**	**-8.1**	**-4.4**	**-1.8**

[a] Before including Non-Product Specific (NPS) assistance. [b] Total of assistance to primary factors and intermediate inputs divided to total value of primary agriculture production at undistorted prices (%). [c] The Relative Rate of Assistance, RRA = $100[(1+NRAag^t/100)/(1+NRAnonag^t/100) - 1]$, where $NRAag^t$ and $NRAnonag^t$ are the average percentage NRAs for the tradables parts of the agricultural and non-agricultural sectors, respectively
Source: Anderson, Lattimore, Lloyd and MacLaren (2007)

Figure 1: Real GDP per capita in Australia, New Zealand and other high-income countries relative to the United States, 1870 to 2004

(United States = 100)
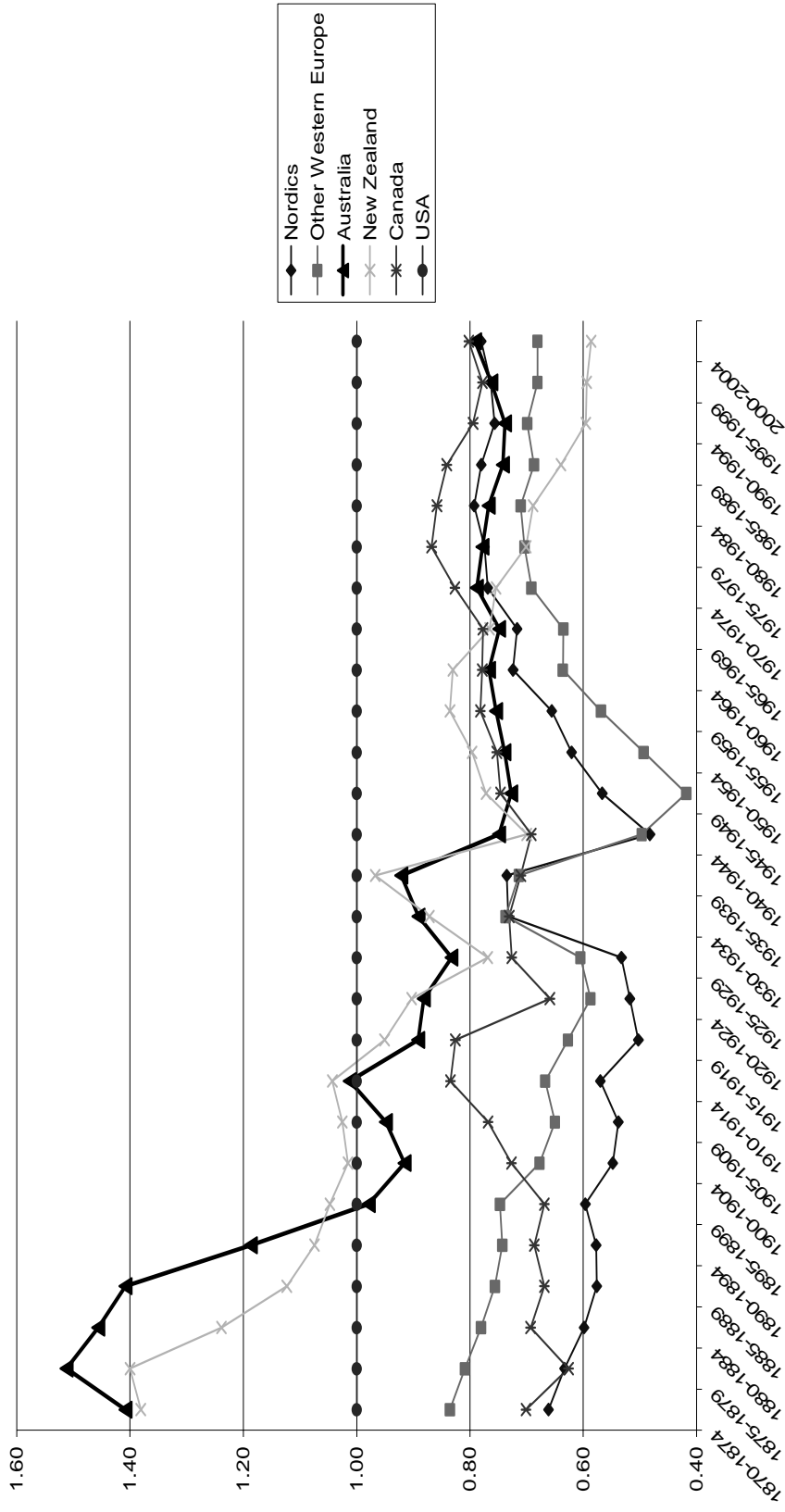
Source: Based on 1990 International Geary-Khamis dollars from Maddison (2003), shown relative to the United States which is set as the numeraire at 100. 'Nordics' includes Denmark, Finland, Norway and Sweden; 'Other Western Europe' includes all with data from 1870, namely Belgium, France, Germany, Italy, Netherlands, Portugal, Spain, Switzerland, and the United Kingdom.

Figure 2: Openness indicators, Australia and New Zealand plus other high-income countries,[a] 1865 to 1993

(percent, five-year averages)

(a) Customs revenue as a share of merchandise imports
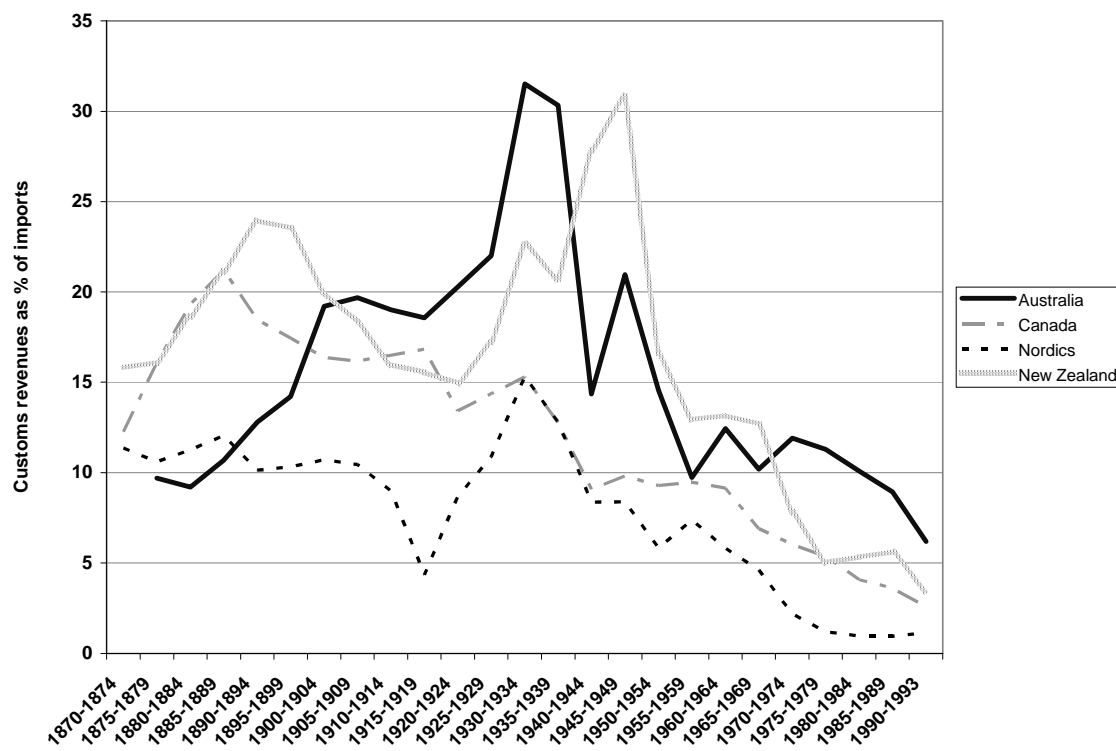
Figure 2 (continued): Openness indicators, Australia and New Zealand plus other high-income countries,[a] 1865 to 1993

(percent, five-year averages)

(b) Merchandise exports plus imports as a share of GDP
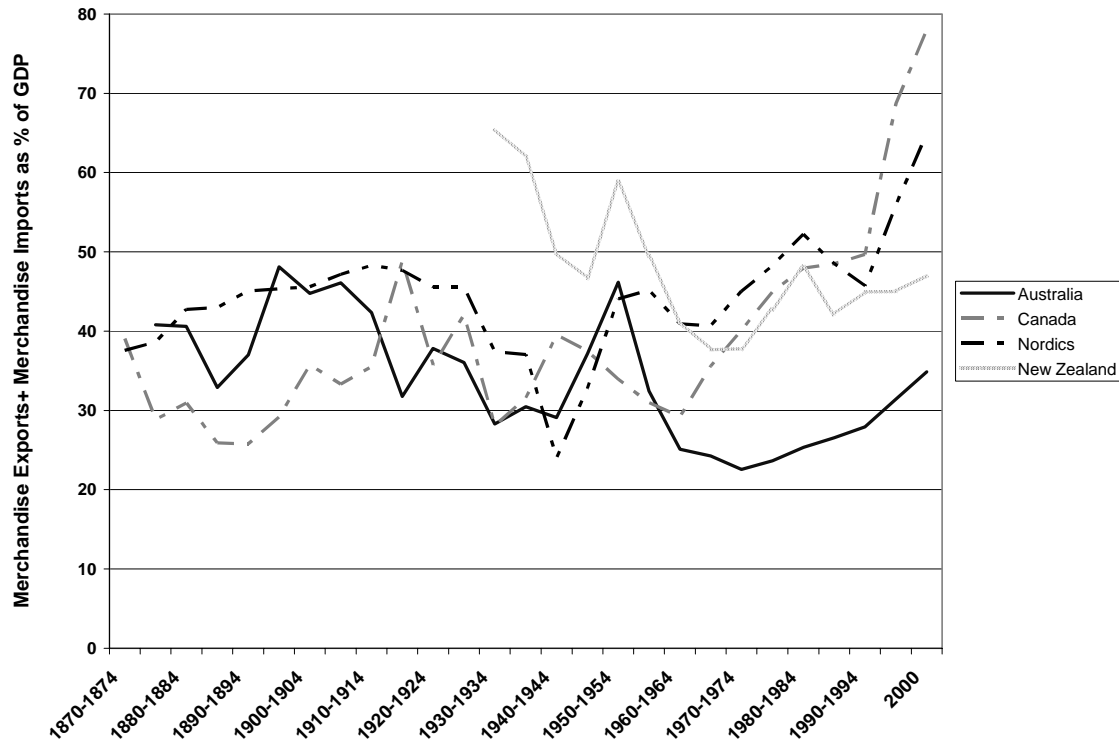
[a] Weighted average for Denmark, Finland, Norway and Sweden, using mid-period imports as the weights for each 5-year period. Data for Australia pre-1901 are from Maloney (2002).
Source: Mitchell (1998a,b,c), Maloney (2002)

Figure 3: Value of agricultural exports as a percentage of gross value of farm production, Australia, 1950-51 to 2005-06
(percent)
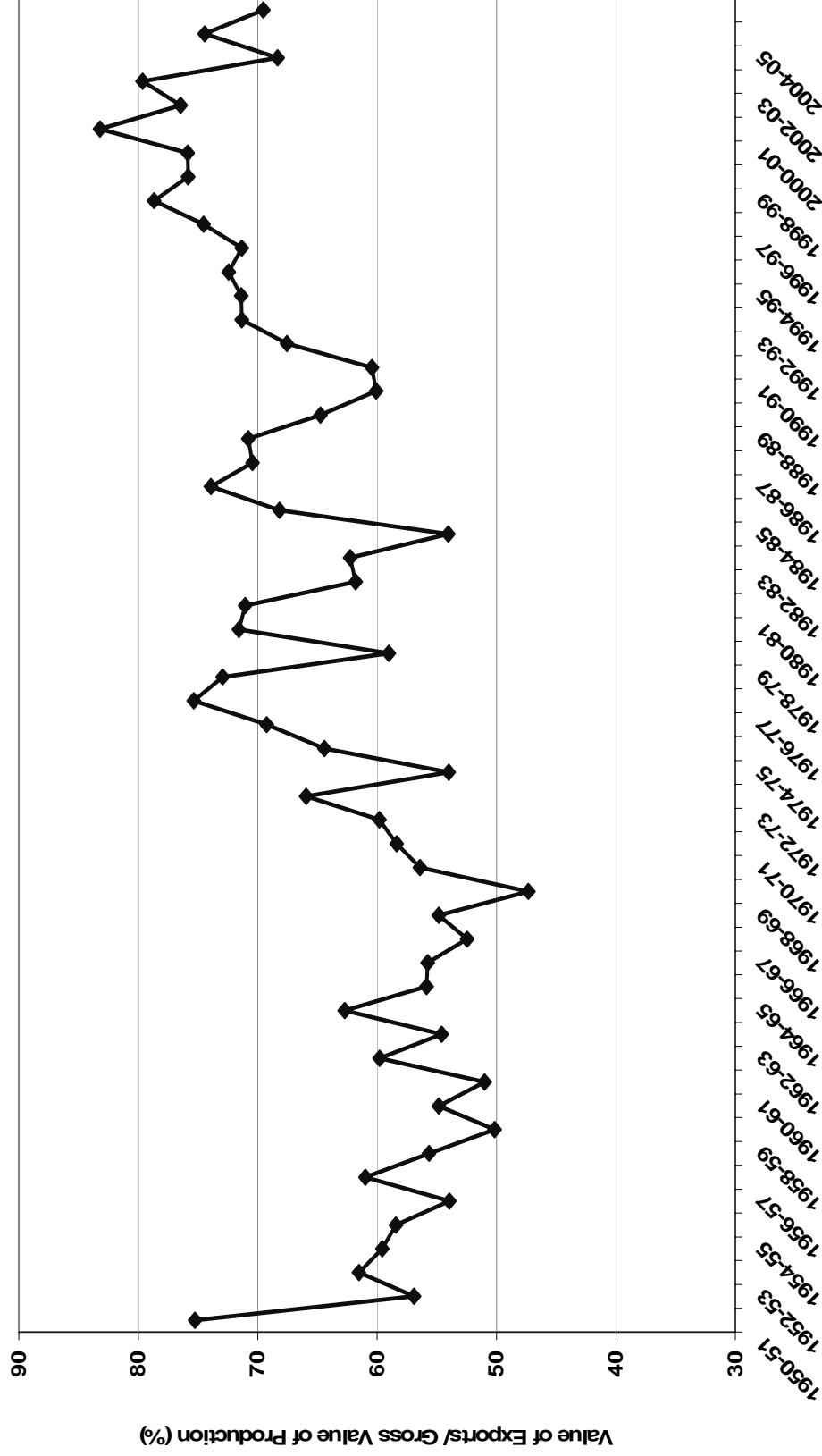
Source: Compiled from data taken from ABARE (2007)

Figure 4: Nominal rates of assistance to exportable, import-competing and all[a] agricultural industries, Australia and New Zealand, 1946 to 2005

(percent, five-year averages)

(a) Australia
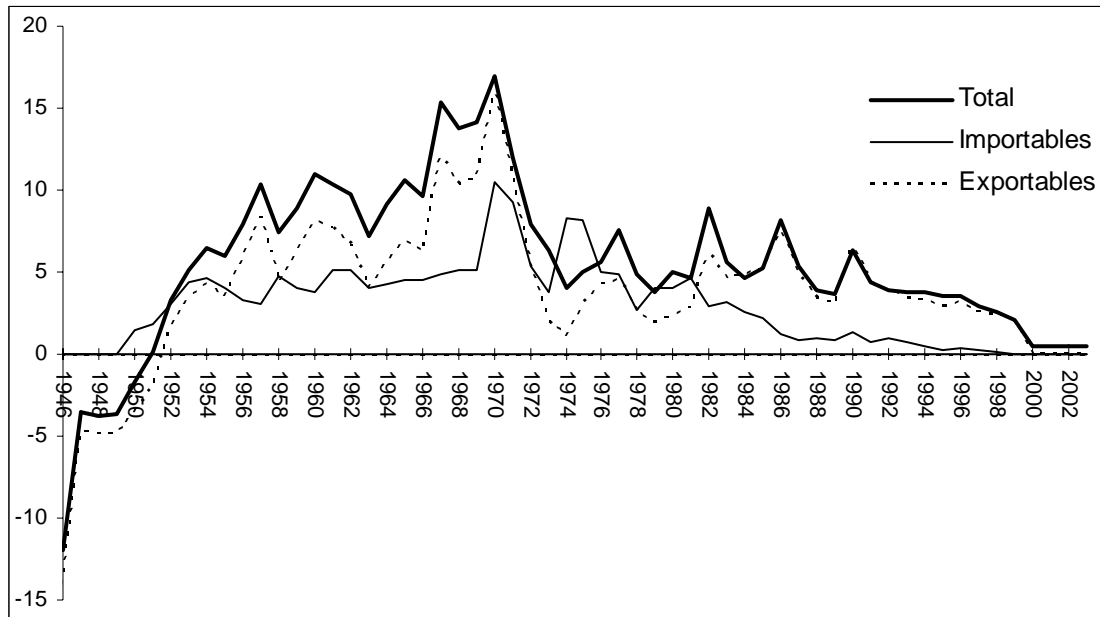
(b) New Zealand
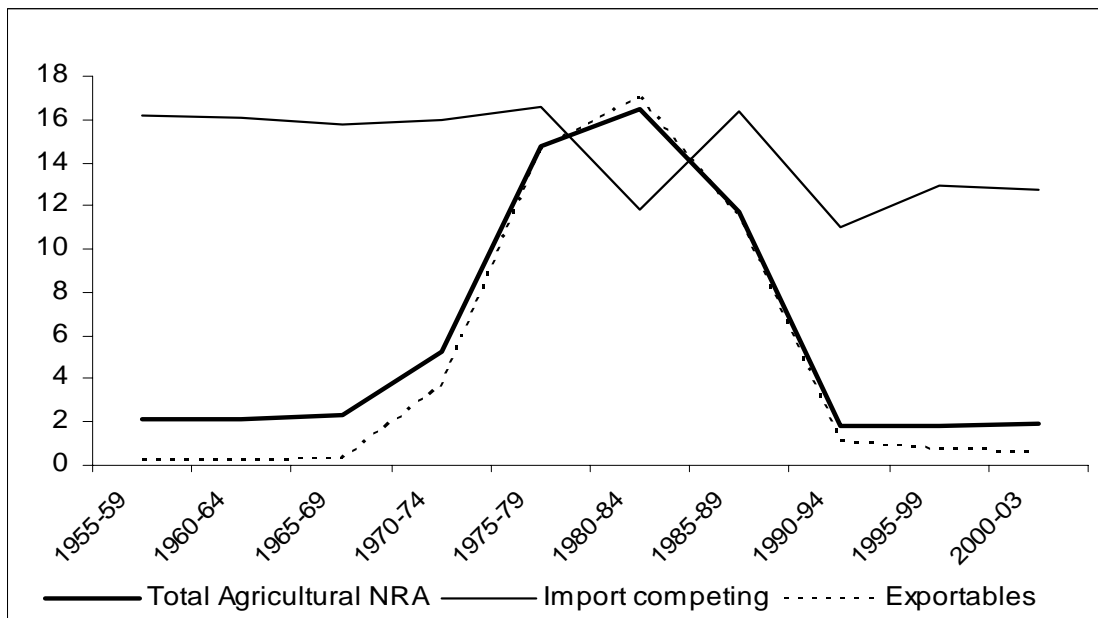
[a] The total NRA can be above both the exportable and importable averages because assistance to nontradables (eg, eggs) and non-product-specific assistance is also included.

Source: Anderson, Lattimore, Lloyd and MacLaren (2007)

Figure 5: Nominal rates of assistance to manufacturing, all non-agricultural tradables, all agricultural tradable industries, and relative rate of assistance,[a] Australia and New Zealand, 1946-47 to 2003-04

(percent, five-year averages)
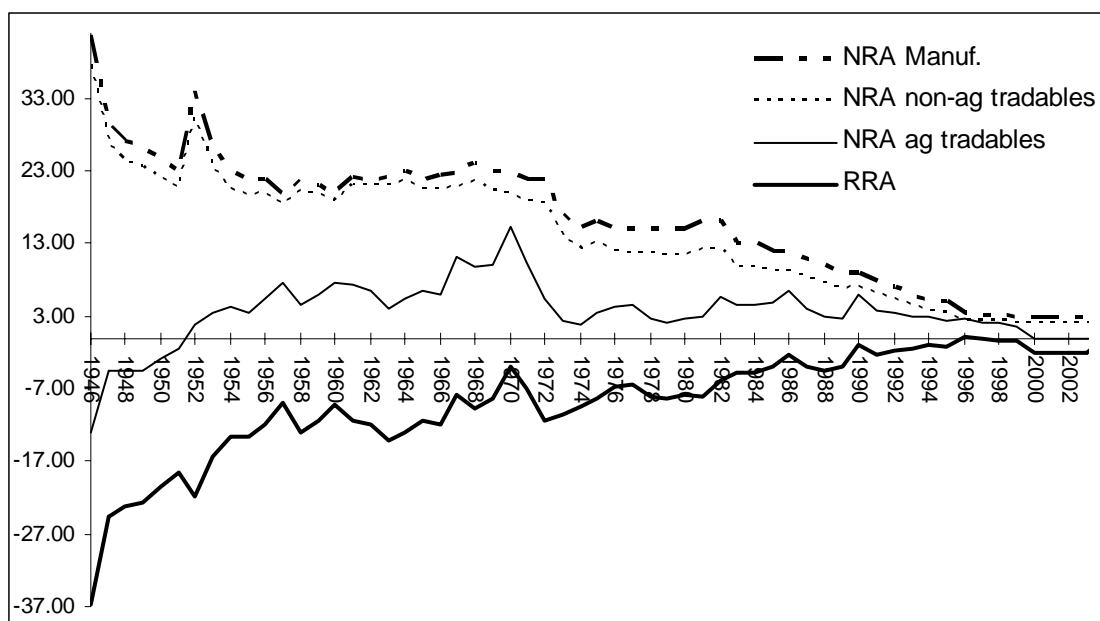
(a) Australia
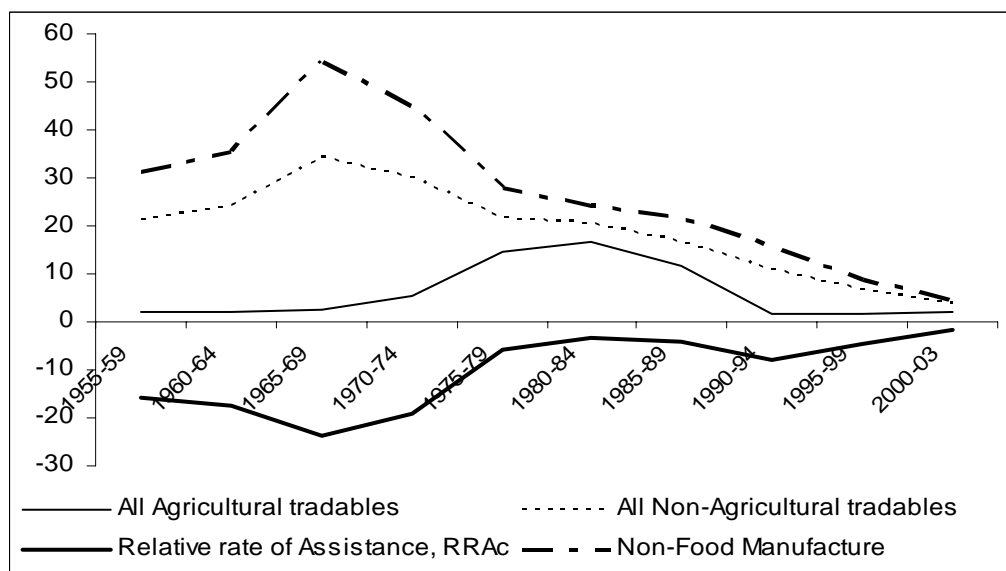
(b) New Zealand

[a] The RRA is defined as $[100(1+NRAag^t/100)/(1+NRAnonag^t/100) - 1]$

Source: Anderson, Lattimore, Lloyd and MacLaren (2007)

Figure 6: Real agricultural total/multi-factor productivity growth, Australia and New
Zealand, 1927 to 2004

(a) Australia
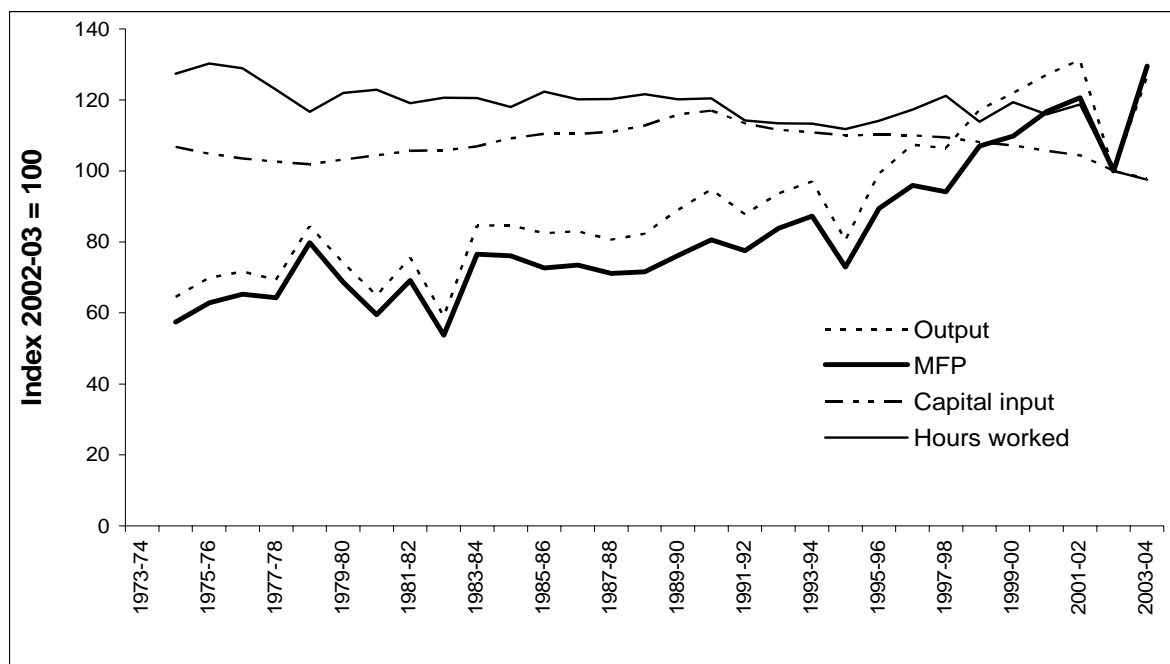
(b) New Zealand
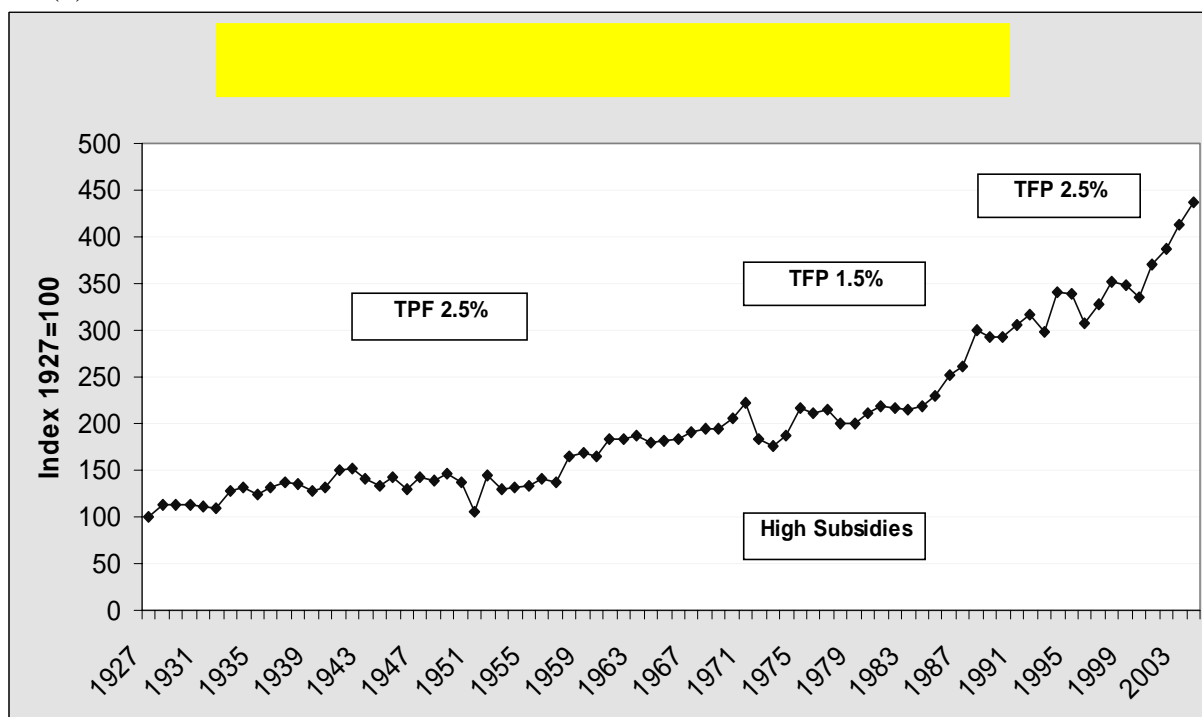
Sources: Productivity Commission (2005, p.121) and Lattimore (2006)

Figure 7: Real farmland prices, New Zealand, 1978 to 2004
(1999 NZ dollars per hectare)
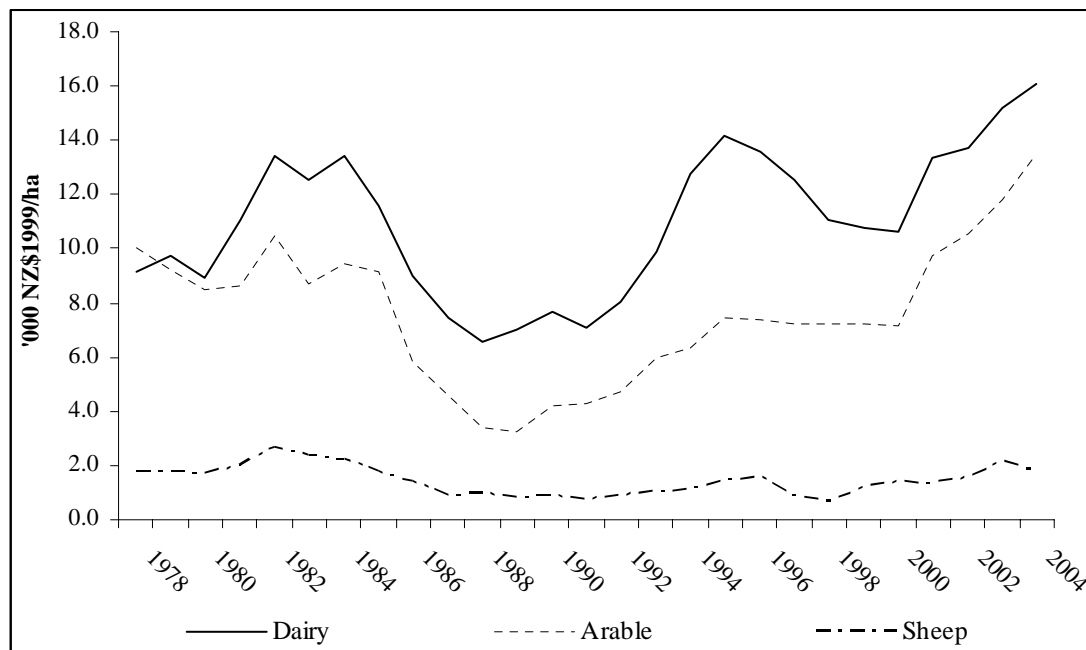
Source: Lattimore (2006)

Appendix: Data Sources for Australia and New Zealand

(a) Australia

Measuring the nominal rates of assistance to agricultural commodities

Australia's Industries Assistance Commission began calculating estimates of the nominal rates of assistance for major agricultural commodities beginning with the year 1970-71. (All years are fiscal, beginning 1 July.) This series has been continued by its successors, the Industry Commission and the Productivity Commission.[17] There are four breaks in the series as each sub-series is benchmarked to the reference years 1970-71, 1983-84, 1990-91 and 1996-97. There are some differences between estimates for these periods. For example, the first three series were compiled on an agricultural commodity basis. On the other hand, for the latest (1996-97 benchmarked) series, the Productivity Commission moved to a ANZSIC industry-based classification of activities, in line with the methodology used for the manufacturing sector industries. For this reason, the series for most individual commodities is not available from 1999-2000. The changes are detailed in Productivity Commission (2002, Methodological Annex A).

For the years before 1970-71, the only comprehensive series available is that published in Lloyd (1973, pp. 149-58), which was prepared by Australia's Bureau of Agricultural Economics. They followed one of the methods used by Harris (1964) in his pioneering paper on agricultural protection in Australia, as explained in Lloyd (1973, Appendix Notes). They cover the major agricultural commodities for which data were available at the time, for the years 1946-47 to 1970-71. The Lloyd/BAE series and the PC series use essentially the same methods. Commodities are designated as either export or import commodities and then direct estimates of the implicit price changes to producers resulting from agricultural assistance were made and expressed as a percentage of the export or (in the case of tobacco and cotton pre-1970) import parity price. Appendix Table 1 reports the Lloyd/BAE and the PC series for the main distorted commodities. (For milk prior to 1970-71, we took a simple average of the Lloyd/BAE estimates for Butter and Cheese, shown in Appendix Table 4, to get the milk NRA shown in Table 2 for those years.)

The two series provide estimates for one year in common, 1970-71. This common year provides a check on the comparability of the two series. As shown at the bottom of Appendix Table 4, the estimates for the common year are reasonably close with the exceptions of tobacco and eggs. For tobacco the differences are explained by differences in the source of imports used to establish the import parity price. Imports of tobacco leaf used in the manufacture of tobacco products in Australia varies greatly in quality and price by source. The choice of source to establish the import parity price is discussed at length in reports by the Industries Assistance Commission (1981, Appendix 5; 1983a, chapter 6.4; and 1983b, Section 4.2). For eggs, it is not clear why the Lloyd/BAE and the PC series give such widely different estimates of the level of assistance, as they cover the

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[17] On the history and workings of this remarkable transparency agency and the policy reform process of which it has been an active participant, see Productivity Commission (2003).

same forms of assistance and use similar methods. That industry has a very small weight in the sectoral aggregate, however, so it does not affect the average NRA for the sector as a whole. For the larger range of industries examined by the Productivity Commission from 1970-71, we report their NRA estimates in Appendix Table 5.

For the industries covered by the Commission but not by Lloyd, 'guesstimates' have been made for the years before 1970, based on the policy descriptions in Edwards (2006) and the references cited therein. The only guesstimate of significant size is for wine grapes, whose NRA is assumed to equal that estimated by Lloyd for dried vine fruit up to 1970. All the other industries had either no assistance (maize, oats, rapeseed, soybean, bananas, olives, wool, beef, sheepmeat, pigmeat, chicken meat) or a very small weight in the total gross value of farm production (for the 1950s and 1960s: apples 6 percent, oranges 25 percent and potatoes 8 percent; and zero NRA for all three pre-1950-51), this introduces little uncertainty as to the average for the sector.

To obtain the weighted averages for agriculture as a whole shown in Table 4, we assumed the NRA was zero for products not covered by the above estimates and 'guesstimates'. This is reasonable since those not covered are mostly small horticultural industries which are not subject to market interventions (apart from quarantine restrictions, which are in place purportedly for health rather than economic protection reasons). For weights we used gross value of production at undistorted prices, calculated by dividing that value at domestic producer prices by (1+NRA/100).

The Commission has used a new, less-disaggregated industry classification from 2000-01 (see Productivity Commission 2004, Appendix B), which provides direct estimates for only dairy, poultry and pig farming. Since all the others have very close to zero nominal assistance, that has been assumed for all but two products whose 1999-00 values are assumed to continue to 2003-04 (rice 1.7 percent and oranges 0.6 percent).

The final column in Appendix Tables 4 and 5 includes 'non-product-specific' assistance (including all assistance via factor and intermediate input markets, even though some of that is in fact product-specific), estimates of which are taken from the Productivity Commission for the period from 1970. We assume them to have been 1.8 percent of the gross value of farm production in 1969, 2 percent in 1960, 0.5 percent in 1946, and linear interpolations between those years.

Lloyd (1993, Table 10.6) also provides consumer tax equivalents for his set of products, reproduced in Appendix Table 7. And in the Appendix Table 8 we reproduce the CTE values for subsequent years as calculated by the OECD (2006).

Measuring the nominal rates of assistance to non-agricultural tradable commodities

The Productivity Commission has not provided systematic NRA estimates for mining for every year, but for those years it has done so in recent decades the values vary within the range of -1 to +1 percent. We therefore simply assume that sector's NRA has been zero since 1960 when the ban on iron ore and coal was lifted. We also assume it is zero for other primary products, since they are not subject to government interventions other than for resource and environmental conservation reasons (and in any case they represent a tiny fraction of GDP).

Estimates of the NRA for manufacturing for the period prior to 1968-69, when Productivity Commission estimates begin, rely on tariffs only. During 1952 to 1960 there

were also protective quantitative restrictions on imports of manufactures (ostensibly for balance of payments reasons in the presence of fixed exchange rates), but since we do not have estimates of the protective effects of those import licences, we simply assume their impact on the average NRA for non-agricultural tradables is exactly offset by the negative impact of the ban on key mining exports in those years.[18]

Since Australia's imports pre-1970 were almost exclusively manufactures, customs revenue as a percentage of the value of all merchandise imports provides a reasonable proxy for the country's nominal rate of tariff protection for manufacturing. Data for that indicator are reported for Australia and New Zealand, together with several other industrial countries, in Appendix Table 1 for 1870 to 1993. They are also reported in Appendix Table 3 from 1944-45 along with that referring just to dutiable imports, using data from the Australian Bureau of Statistics (ABS, previously the Commonwealth Bureau of Census and Statistics, CBCS). The latter were compiled by Lloyd (2006). Since these series relate to customs duties only they do not include assistance due to non-tariff measures, apart from anti-dumping and countervailing duties and also revenue duties ("Primage"). They include an adjustment for refunds and drawbacks of customs duties, and they include primage duties where applicable because these added significant protection to Australian producers of many goods. The first column also includes duties levied on excisable goods,[19] and refers to actual rates levied on imports, thereby combining MFN, preferential and concessional tariffs on final goods and intermediate or capital inputs. Since those inputs that were not competitive with Australian-produced goods were admitted duty free under by-law and concessional import schemes, the series has long been regarded as less useful than the series of the average tariff on dutiable imports only. Thus the best available series measuring the average nominal protection due to the Australian tariff over the period to 1968 (after which more-comprehensive Productivity Commission estimates are available) is that in the second column of Appendix Table 3.

Both tariff series in Appendix Table 3 are averages calculated using import weights. The problem of selecting weights has vexed economists worldwide since the pioneering study on this subject by the League of Nations (1927). In Australia, it vexed economists from the time of the first attempts to consider the problem by Crawford (1930) and Carmody (1952). The method of calculating the average tariff by dividing the total duty collected by the value of imports is of course simply an arithmetic mean, using the percentage of imports of each good in the current period as the weights (a Paasche Index). This statistic has the desirable statistical properties that the weights are all positive fractions and sum to unity. Since the time of the League of Nations study it has been standard practice to object to the use of import weights on the ground that this practice understates the relative importance of goods subject to high tariffs. In particular, prohibitive tariffs, which are extremely important from a welfare point of view, receive a

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[18] In years prior to the 1950s, the relatively low international prices of mineral and energy products (world Bank 2000), combined with the very high cost of transporting bulky coal and iron ore from Australia to the North Atlantic's industrial hub, means that export ban was probably redundant – other than to signal Australia's unwillingness at that time to provide industrial raw materials to Japan. For more on mining policies historically, see Doran (1984), and on mineral taxation in particular, see Gruen (1978, Ch. 4).

[19] The duty collected should be adjusted to cover only the margin over the excise duty levied on like Australian-produced goods, but that was not possible.

zero weight. But this is not a fatal objection. The simplest and most instructive way to view this is with a partial equilibrium version of the Trade Restrictiveness Index (Anderson and Neary 1994, Anderson 1995), using the formula for the tariff's welfare loss on each good due to Harberger (1959, 1964) or some restatement of the formula in terms of equivalent variation (rather than the Marshallian triangle for the consumer surplus component). When this formula is used, the average tariff is defined as the single uniform tariff that would result in the same aggregate loss to the economy as the structure of differentiated tariffs. Amazingly, this turns out to be the mean of order two, not the arithmetic mean or the geometric mean favoured by the League of Nations (1927) and some others since. This choice of mean reflects the importance of the Harberger "square rule", that is, the loss of welfare due to a tariff is proportional to the square of the (ad valorem) tariff rate.[20] Because the arithmetic mean obtained by dividing the revenue by the value of imports (total or dutiable only) is the only readily available index from long time series, it simply needs to be recognized that the resultant import-weighted average of the tariff rates on individual goods understates the true figure because it uses current period import weights and because it uses the ad valorem (or ad valorem equivalent) rates rather than the squares of these rates. However, it is the best we can do, and it is better than using any other system of weights in an arithmetic mean or the unweighted mean.

For the period since 1968-69, the Productivity Commission (and its predecessors the Industries Assistance Commission and the Industry Commission) provides estimates of both nominal and effective rates of assistance to manufacturing, for industry sub-categories down to the 4-digit level. In addition to tariffs these cover subsidies, bounties and discriminatory sales taxes but initially did not cover quantitative restrictions, content plans, etc. (Industries Assistance Commission 1976, p.4). The latter are covered for the later period from 1982-83 though. The average nominal assistance on outputs for the whole sector is reproduced in the final column of Appendix Table 3. The treatment of tariffs and para-tariffs differs in some respects from that in the other two columns. The Commission uses General (MFN) tariff rates, except for those few items where imports are overwhelmingly from the preferential source. For excisable goods, the Commission includes only the margin of protection. Both of these procedures are preferable, but the differences they make to the estimates are small. Probably of more importance, the Commission's estimates of nominal rates of assistance use production weights at unassisted prices, which are preferable for current purposes than import weights. Nonetheless, the average tariff on dutiable imports may be as reliable an indicator of the turning points and trends in the levels of assistance to the manufacturing sector as the Commission's series.

The calculation of the two tariff series is not just a simple matter of transcribing the customs revenue and import values for each year and dividing. First, there is a break

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[20] Thus the weighting problem with the import-weighted mean is not the use of import weights but the incorrect choice of current period import weights rather than the free trade situation weights. And one should calculate the mean of order two, not the arithmetic mean (which is the mean of order one). It is easy to show by example that the use of current period import weights and the use of the arithmetic mean can both result in serious understatements of the true welfare-relevant average tariff. But the estimation of free trade weights is difficult. And the calculation of the square of the tariff rates is a huge job in each year of a time series as it requires the explicit statement of the ad valorem rates for each tariff item or, worse, the calculation of the ad valorem equivalent rates. This must be repeated in every year of the series.

in the series in 1988-89 at which time the ABS switched to electronic recording. We obtained from the ABS an electronic copy of the annual revised series of Import Clearances and Duty paid on all imports, cross-classified by the rate of duty and type of imports (Normal, Concessional, Government) for the years 1988-89 to 2004-05. Then the averages calculated from these series can be compared with the averages calculated from the hard copy figures published for earlier years, although there are minor differences due to the different treatment of Refunds and Drawbacks in the electronic series.

Second, for the pre-electronic series, CBCS and ABS published the figures on different bases over different periods. It is necessary to make several adjustments to obtain a series which maintains a consistent definition of duties collected and of the values of imports cleared home consumption. One problem is that, in the pre-electronic period that spans the 38 years from 1949-50 to 1987-88, some of the series are reported in gross terms and some in net terms, that is, net of Refunds and Drawbacks of Customs and Primage Duties. A second problem is that some revenue duties are excluded in the figures of customs duties collected and some are included. These problems are discussed in turn.

After the end of each financial year, refunds and drawbacks are made of some duties collected because the duties were levied improperly in the first instance or because the imports were found to be eligible for drawback as the goods in which the imports were incorporated were subsequently exported. Any series of average duties which is intended to measure the protective effect of import duties should use duty statistics which are net of both refunds and drawbacks. Prior to 1988-89, statistics published by the CBCS/ABS are sometimes reported on a gross basis and sometimes on a net basis. The net figures have been used where available. Where not available, the total value of Refunds and Drawbacks for each year is published separately and has been used in the calculation of the adjusted series of average duty on dutiable imports (see below). From 1988-89, there is no longer a series of refunds and drawbacks. The ABS receives a daily file from the Customs Department of all records cleared the previous day. The daily file records any adjustments to a record previously lodged with Customs and the ABS records are amended as long as the original files are kept. Since previous records are kept for just six months, only those refunds and drawbacks which are recorded within six months of the original clearances are netted. Those refunds and drawbacks that take more than six months to be processed are not reflected in the ABS data. For this reason, there is a minor inconsistency between the pre-electronic and the post-electronic statistics, the latter overstating slightly the true value of net customs duty collected.

Over the period since 1950, four different revenue duties have been levied for sub-periods. These duties are troublesome for the calculation of a consistent series of average tariffs. There are four types:

(i) Primage duties were introduced in 1930 and remained until the last primage duties were abolished on 1 January 1983. They were introduced as a revenue tax, mainly on luxury items, but they applied to imports of many goods produced in Australia as wells to some non-competitive imports and, for these goods, they provided additional protection.[21] They were ad valorem duties and in the early part of our 50-year period the

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[21] Goods which were the produce or manufacture of New Zealand, Fiji, Papua New Guinea and some other Pacific Islands were exempt and, therefore, the duties discriminated by source.

most common rate was 10 per cent. In the early 1950s primage duties amounted to almost 10 per cent of the total duties including primage, and therefore added significantly to the measured levels of protection from the Australian tariff. However, from the mid-1950s, the number of tariff items on which primage was levied was steadily reduced by the abolition of some of these duties or by their incorporation in normal duties, and the rates were also lowered. By the mid-1960s they amounted to roughly 2 per cent only of the total duties collected. To maintain a consistent series, for the years in which they applied we incorporated the revenue collected in the statistics of total duty collected each year.

(ii) A 2 per cent duty on items previously cleared free of duty was applied for almost nine years, from 1 July 1979 to 11 May 1988. This was a revenue measure, announced in May before the 1979 Budget and removed in the Budget of 1988. During the period in which it applied, this tax collected on average around $150 million each year. This amounted to about 7.5 percent of total duty collected during the period.

(iii) A 3 per cent duty on imported business inputs which did not have a substitute manufactured in Australia was introduced before the Budget of 1996, effective from 1 July 1996. This too was a revenue measure. However, there was an exemption for inputs used in the textile, clothing, footwear, motor vehicle and food industries. The duty remained until it was abolished in the Budget of 2005, effective from 11 May 2005, after a report by the Productivity Commission (2000) had recommended its abolition. During the period in which it applied, this tax collected around $200million each year, amounting to about 5 percent of total duty collected during the period. Since both the 2 per cent and the 3 per cent duties were levied on non-competitive imported materials and inputs, they raised the prices in Australia of the goods concerned but they did not provide protection to Australian manufacturers. Indeed they reduced the effective rates of protection of those goods which used these inputs. The adjustments have been made each year by identifying, exactly or as closely as possible, the goods cleared and subject to these duties, and then subtracting the value of duty collected from the revenue tax in the numerator and subtracting the value of the dutiable imports on which these duties were levied in the denominator.

(iv) Excise taxes (specific duties levied on the production or manufacture of certain goods) in Australia apply to three main groups of goods, namely, alcoholic beverages excluding wine, tobacco products, and refined petroleum fuels. These duties are revenue taxes, levied on these so-called "sin goods" at high rates when expressed in ad valorem terms. All goods that are excisable when produced in Australia are subject to a specific tariff at a rate which is as higher than or as high as the excise duty rate on the corresponding domestic like product. When excise duty rates have been increased or decreased, the same adjustment has usually been made for the tariff on corresponding imports. All statistics of duty collected published by CBCS/ABS include the whole duty collected from the tariff rates on these items, rather than capturing just the margin of protection. Hence they overstate the rates of assistance to these excisable goods.
The only published study that has calculated the ad valorem equivalent nominal rates of assistance to excisable goods is for the years 1950-51 to 1971-72 (Lloyd 1975). He found that the nominal rates of protection to excisable goods were generally high (the solitary exception was Motor Spirits) compared to those due to tariffs on non-excisable goods. However, he also found this protective part was on average less than one-quarter of the average customs duty on these goods, the rest being a duty to match the rate of excise

duty levied on excisable goods produced in Australia. However, since the customs duty collected on excisable goods is a small part of the total customs duty collected, this overstatement is not serious. And note that the Productivity Commission and its predecessors have included only the protective margin in their calculations of nominal rates of assistance to excisable goods.

To get the average nominal rate of assistance (NRA) for all non-agricultural tradables, we assumed only (and all) service sectors produce non-tradables, and a zero NRA for non-agricultural primary sectors. For manufacturing, we use the Productivity Commission NRA output estimates from 1968-69 (ignoring their estimates of net assistance via primary factor and intermediate input markets, which in the past decade would have lowered them by about one-fifth), while for earlier years the dutiable import tariff averages estimated by Lloyd are used (the second column in Appendix Table 3). The latter may overstate assistance to the sector in so far as some competing imports come in duty free; but that is assumed to be offset by the numerous non-tariff barriers to imports that were in place in the years prior to 1970. For the first two years of overlap in the two series in the late 1960s, they are almost identical (at 23 percent).

(b) New Zealand

[To be added]

Appendix Table 1: Customs revenue as a share of merchandise imports, Australia, New Zealand and other high-income countries, 1865 to 1993
(percent, five-year averages)

	Australia	New Zealand	Argentina	Canada	United States	Nordics[a]
1865-69	na	na	na	na	42	na
1870-74	na	16	na	12	35	11
1875-79	10	16	na	16	29	11
1880-84	9	19	na	19	29	11
1885-89	11	21	na	21	30	12
1890-94	13	24	na	18	23	10
1895-99	14	24	43	17	23	10
1900-04	19	20	30	16	27	11
1905-09	20	18	21	16	23	10
1910-14	19	16	18	16	18	9
1915-19	19	16	12	17	8	4
1920-24	20	15	14	13	12	9
1925-29	22	17	17	14	13	11
1930-34	32	23	24	15	19	15
1935-39	30	21	22	13	15	13
1940-44	14	28	13	9	11	8
1945-49	21	31	12	10	7	8
1950-54	15	17	38	9	5	6
1955-59	10	13	29	9	6	7
1960-64	12	13	27	9	7	6
1965-69	10	13	31	7	7	5
1970-74	12	8	41	6	5	2
1975-79	11	5	28	5	3	1
1980-84	10	5	32	4	3	1
1985-89	9	6	20	4	3	1
1990-93	6	3	9	3	3	1

[a] Weighted average for Denmark, Finland, Norway and Sweden, using mid-period imports as the weights for each 5-year period. Nordic data pre-1900 refers just to Denmark, Norway and Sweden, taken from Maloney (2002). Data for Australia pre-1901 also are from Maloney (2002).

Source: Mitchell (1998a,b,c) and Maloney (2002).

Appendix Table 2: Merchandise exports plus imports as a share of GDP, Australia and New Zealand plus other high-income countries,[a] 1865 to 2000
(percent, five-year averages)

	Australia	New Zealand	Argentina	Canada	United States	Nordics[a]
1865-69	na	na	na	na	7	na
1870-74	na	na	na	39	12	38
1875-79	41	na	na	29	12	39
1880-84	41	na	na	31	12	43
1885-89	33	na	na	26	11	43
1890-94	37	na	na	26	12	45
1895-99	48	na	na	29	11	45
1900-04	45	na	na	36	11	46
1905-09	46	na	na	33	11	47
1910-14	42	na	na	36	12	48
1915-19	32	na	na	49	16	48
1920-24	38	na	na	36	11	46
1925-29	36	na	58	42	10	46
1930-34	28	65	49	28	6	37
1935-39	30	62	38	32	6	37
1940-44	29	50	31	40	7	24
1945-49	37	47	26	37	7	33
1950-54	46	59	22	34	7	44
1955-59	32	49	34	31	7	45
1960-64	25	41	14	29	7	41
1965-69	24	38	10	36	7	41
1970-74	23	38	11	40	10	45
1975-79	24	43	17	45	14	48
1980-84	25	48	18	48	15	52
1985-89	27	42	13	49	15	48
1990-94	28	45	12	50	16	46
1995-99	31	45	18	69	19	56
2000	35	47	18	78	20	65

[a] Weighted average for Denmark, Finland, Norway and Sweden, using mid-period imports as the weights for each 5-year period. Data after 1993 are from World Bank (2006) and for Australia pre-1901 are from Maloney (2002).

Source: Compiled from data in Mitchell (1998a,b,c), Maloney (2002) and World Bank (2006).

Appendix Table 3: Customs revenue as a share of imports and nominal rate of assistance for manufacturing, Australia, 1944-45 to 2004-05
(percent)

	Net[a] customs plus primage, all imports	Net[a] customs plus primage, dutiable imports	Nominal rate of assistance, manufacturing	Share of manufacturing in total value of Non-Ag tradables	Average NRA for Non-Ag tradables
1944-45	10.1	52.0	na	90.0	46.8
1945-46	16.3	49.4	na	90.0	44.5
1946-47	22.0	41.7	na	90.0	37.5
1947-48	17.0	29.7	na	90.0	26.7
1948-49	15.3	27.0	na	90.0	24.3
1949-50	14.5	26.2	na	90.0	23.6
1950-51	12.4	24.5	na	90.0	22.1
1951-52	10.9	23.0	na	90.0	20.7
1952-53	13.9	33.9	na	90.0	30.5
1953-54	14.0	26.3	na	90.0	23.7
1954-55	12.0	22.9	na	90.0	20.6
1955-56	10.7	22.0	na	90.0	19.8
1956-57	9.6	21.9	na	91.0	19.9
1957-58	9.1	19.8	na	92.0	18.2
1958-59	9.0	21.7	na	93.0	20.2
1959-60	9.1	21.2	na	93.0	19.7
1960-61	9.4	20.0	na	94.0	18.8
1961-62	9.6	22.1	na	95.0	21.0
1962-63	9.7	22.0	na	96.0	21.1
1963-64	9.8	22.3	na	95.0	21.2
1964-65	9.8	22.9	na	94.0	21.5
1965-66	9.3	22.0	na	93.0	20.5
1966-67	9.1	22.4	na	92.0	20.6
1967-68	9.6	22.8	na	91.0	20.7
1968-69	10.1	23.0	24.0	90.0	21.6
1969-70	10.7	23.3	23.0	88.0	20.2
1970-71	12.4	25.5	23.0	87.0	20.0
1971-72	12.9	26.6	22.0	86.0	18.9
1972-73	13.2	30.1	22.0	85.0	18.7
1973-74	10.4	26.8	17.0	84.0	14.3
1974-75	10.8	28.6	15.0	82.0	12.3
1975-76	11.7	29.7	16.0	81.0	13.0
1976-77	11.5	29.4	15.0	80.0	12.0
1977-78	10.4	29.0	15.0	79.0	11.9
1978-79	10.2	31.3	15.0	78.0	11.7
1979-80	9.9	28.8	15.0	77.0	11.6
1980-81	9.7	28.4	15.0	76.0	11.4
1981-82	9.2	27.7	16.0	76.0	12.2
1982-83	9.5	28.1	16.0	76.0	12.2
1983-84	9.9	27.0	13.0	76.0	9.9
1984-85	10.0	27.0	13.0	76.0	9.9
1985-86	9.6	26.3	12.0	76.0	9.1
1986-87	8.7	24.8	12.0	76.0	9.1
1987-88	8.9	24.3	11.0	76.0	8.4

	Net[a] customs plus primage, all imports	Net[a] customs plus primage, dutiable imports	Nominal rate of assistance, manufacturing	Share of manufacturing in total value of Non-Ag tradables	Average NRA for Non-Ag tradables
1988-89	8.3	23.5	10.0	76.0	7.6
1989-90	8.0	22.9	9.0	76.0	6.8
1990-91	7.3	21.3	9.0	77.0	6.9
1991-92	6.9	20.4	8.0	77.0	6.2
1992-93	6.0	18.9	7.0	76.0	5.3
1993-94	5.4	17.1	6.0	74.0	4.4
1994-95	4.9	16.1	5.0	73.0	3.7
1995-96	4.3	14.7	5.0	72.0	3.6
1996-97	4.4	12.2	3.5	72.0	2.5
1997-98	4.4	11.3	3.3	71.0	2.3
1998-99	4.1	10.9	3.2	71.0	2.2
1999-00	3.7	10.6	3.0	71.0	2.1
2000-01	4.0	11.2	2.8	71.0	2.0
2001-02	4.0	10.4	2.8	71.0	2.0
2002-03	3.9	10.0	2.8	71.0	2.0
2003-04	3.9	10.0	2.8	72.0	2.0
2004-05	3.5	9.5	2.6	72.0	1.9

[a]Net of Refunds and Drawbacks of Customs and Primage Duties

Sources: Lloyd (2006) based on data from Australian Bureau of Statistics files and, for the final column, Productivity Commission (2003) and Industry Commission (1995)

Appendix Table 4: Nominal rates of assistance, main distorted agricultural products, Australia, annual 1946-47 to 1969-70

(percent)

	Rice	Wheat	Barley	Sugar	Cotton	Eggs	Butter	Cheese	Dried vine fruits	Tobacco	ALL, wted. ave.[a]		RRA Cov. Prods.
											Cov. Prods.	All prods.& inputs	
1946-47	-1.0	-44.3	na	1.6	na	3.0	1.4	5.9	7.5	na	**-13.5**	**-12.0**	**-13.5**
1947-48	-4.0	-16.7	-23.9	-15.6	na	1.1	1.2	4.5	9.8	na	**-4.6**	**-3.6**	**-4.6**
1948-49	-4.4	-18.0	-16.7	-9.5	na	-5.2	-0.2	1.8	12.0	na	**-4.9**	**-3.7**	**-4.9**
1949-50	-3.5	-17.9	-15.7	-9.2	na	-5.5	-0.1	1.9	12.8	na	**-4.9**	**-3.7**	**-4.9**
1950-51	-14.2	-21.2	-18.0	-14.2	na	2.4	4.4	6.1	2.3	na	**-3.2**	**-1.7**	**-3.2**
1951-52	-7.2	-17.6	-14.5	-6.6	na	21.6	11.4	15.6	22.9	5.5	**-1.1**	**0.1**	**-1.1**
1952-53	-0.8	-7.6	-1.2	3.7	na	8.8	24.1	25.8	4.0	22.2	**2.5**	**3.3**	**2.5**
1953-54	5.9	-0.1	4.1	9.9	3.2	9.9	22.2	24.1	6.8	58.2	**4.5**	**5.1**	**4.5**
1954-55	10.7	4.3	0.5	10.6	-2.6	30.9	22.9	30.3	6.5	79.5	**6.1**	**6.4**	**6.1**
1955-56	10.1	1.2	4.5	10.0	5.4	35.0	32.0	13.0	4.2	48.4	**5.3**	**5.9**	**5.3**
1956-57	8.9	-2.1	3.7	13.1	30.3	31.6	53.5	50.1	4.1	46.4	**7.9**	**7.9**	**7.9**
1957-58	9.9	1.4	-0.4	7.7	30.9	48.8	89.8	100.5	3.7	45.7	**11.0**	**10.3**	**11.0**
1958-59	12.8	2.5	2.2	15.4	23.8	57.0	43.0	11.5	4.1	58.2	**6.5**	**7.5**	**6.5**
1959-60	15.3	6.6	10.6	17.8	43.3	46.3	40.0	35.4	11.9	56.4	**8.4**	**8.9**	**8.4**
1960-61	13.8	8.2	3.8	22.9	42.9	58.2	78.9	34.6	11.0	29.2	**10.1**	**11.0**	**10.1**
1961-62	11.6	6.9	3.2	27.9	-2.1	41.8	58.4	40.2	11.5	64.0	**9.5**	**10.3**	**9.5**
1962-63	13.9	8.9	5.5	16.9	34.2	59.6	44.8	30.9	11.6	57.3	**8.8**	**9.8**	**8.8**
1963-64	17.2	0.6	2.1	-2.6	93.2	55.6	41.4	31.9	7.5	44.1	**6.1**	**7.2**	**6.1**
1964-65	18.5	5.9	0.9	14.2	92.3	94.0	41.8	27.7	6.8	40.0	**8.2**	**9.1**	**8.2**
1965-66	13.0	7.1	1.7	26.6	106.0	138.2	51.1	32.6	11.7	62.4	**10.3**	**10.6**	**10.3**
1966-67	10.5	3.4	2.2	30.5	86.8	100.0	51.4	38.4	13.4	46.1	**8.6**	**9.6**	**8.6**
1967-68	11.4	18.8	13.2	38.9	75.5	129.5	94.4	89.9	15.2	48.3	**15.4**	**15.4**	**15.4**
1968-69	15.7	8.2	2.9	37.4	61.4	187.9	107.2	105.6	32.5	52.6	**13.0**	**13.8**	**13.0**
1969-70	23.4	12.8	1.8	30.6	39.8	150.6	88.6	85.8	21.3	47.0	**14.2**	**14.2**	**14.2**
1970-71	<u>16.2</u>	<u>15.6</u>	<u>-0.6</u>	<u>19.2</u>	<u>46.1</u>	<u>119.3</u>	<u>92.2</u>	<u>60.2</u>	<u>37.1</u>	<u>46.5</u>	**17.5**	**17.0**	**17.5**
1970-71	*28.0*	*20.0*	*0.0*	*23.0*	*100.0*	*29.0*	*92.2*	*60.2*	*44.0*	*>250*			

[a] The TOTAL agric weighted average uses weights based on the unassisted value of production (actual back to 1966, and the average for 1966-69 for earlier years), from Anderson, Lattimore, Lloyd and MacLaren (2007). For the products covered by the Commission but not by Lloyd, 'guesstimates' have been made for the years before 1970, based on the policy descriptions in Edwards (2006) and the references cited therein. The only guesstimate of significant size is for wine grapes, whose NRA is assumed to equal that estimated by Lloyd for dried vine fruit up to 1970. All others had either no assistance (maize, oats, rapeseed, soybean, bananas, olives, wool, beef, sheepmeat, pigmeat, chicken meat) or a very small weight in the total gross value of farm production (for the 1950s and 1960s: apples 6 percent, oranges 25 percent and potatoes 8 percent; and zero NRA for all three pre-1950-51). The final column assumes all products not shown had an NRA of zero, and it includes non-product-specific assistance which is assumed to have been 1.8 percent of the gross value of farm production in 1969, 2 percent in 1960, 0.5 percent in 1946, and linear interpolations between those years.

[b] The final column shows the relative rate of assistance as defined on page 8 of the text

Sources: Lloyd (1973, Table 10.4) except last row which is provided, for comparative purposes, from Appendix Table 2 from the Industry Commission (1995)

Appendix Table 5: Nominal rates of assistance,[a] all agricultural products, Australia, annual, 1970-71 to 2003-04
(percent)

Year	Rice	Wheat	Barley	Oats	Sorghum	Maize	Apples	Grapes, drying	Grapes, wine	Bananas	Olives	Oranges	Potatoes	Soybean
1970-71	28.0	20.0	0.0	0.0	0.0	0.0	6.0	44.0	52.0	0.0	0.0	25.0	8.0	0.0
1971-72	46.0	20.0	0.0	0.0	0.0	0.0	11.0	27.0	53.0	0.0	0.0	25.0	8.0	0.0
1972-73	15.0	12.0	0.0	0.0	0.0	0.0	8.0	34.0	51.0	0.0	0.0	26.0	8.0	0.0
1973-74	6.0	-10.0	0.0	0.0	0.0	0.0	8.0	0.0	50.0	0.0	0.0	26.0	6.0	0.0
1974-75	15.0	-8.0	0.0	0.0	0.0	0.0	12.0	7.0	50.0	0.0	0.0	25.0	6.0	0.0
1975-76	23.0	-2.0	0.0	0.0	0.0	0.0	9.0	36.0	36.0	0.0	0.0	23.0	6.0	0.0
1976-77	26.0	3.0	0.0	0.0	0.0	0.0	9.0	27.0	30.0	0.0	0.0	21.0	6.0	0.0
1977-78	26.0	2.0	0.0	0.0	0.0	0.0	2.0	0.0	17.0	0.0	0.0	38.0	8.0	0.0
1978-79	13.0	-2.0	0.0	0.0	0.0	0.0	2.0	3.0	17.0	0.0	0.0	41.0	8.0	0.0
1979-80	14.0	-3.0	0.0	0.0	0.0	0.0	5.0	-3.0	17.0	0.0	0.0	41.0	8.0	0.0
1980-81	18.0	2.0	0.0	0.0	0.0	0.0	2.0	4.0	21.0	4.0	0.0	47.0	8.0	0.0
1981-82	8.0	2.0	0.0	0.0	1.0	0.0	8.0	19.0	21.0	7.0	0.0	52.0	8.0	0.0
1982-83	22.0	5.0	0.0	0.0	1.0	0.0	2.0	31.0	21.0	7.0	0.0	34.0	8.0	0.0
1983-84	20.0	2.0	0.0	0.0	2.0	0.0	2.0	45.0	16.0	5.0	0.0	34.0	8.0	0.0
1984-85	8.0	2.0	0.0	0.0	2.0	0.0	3.0	21.0	16.0	1.0	0.0	24.0	8.0	0.0
1985-86	11.0	2.0	0.0	0.0	2.0	0.0	1.0	18.0	16.0	1.0	0.0	18.0	8.0	0.0
1986-87	19.0	14.0	0.0	0.0	2.0	0.0	1.0	17.0	16.0	1.0	0.0	19.0	8.0	0.0
1987-88	17.0	1.0	0.0	0.0	2.0	0.0	1.0	25.0	18.0	1.0	0.0	10.0	0.0	0.0
1988-89	3.0	1.0	0.0	0.0	2.0	0.0	1.0	22.0	21.0	1.0	0.0	12.0	0.0	0.0
1989-90	3.0	1.0	0.0	0.0	2.0	0.0	2.0	18.0	16.0	1.0	0.0	6.0	0.0	0.0
1990-91	4.4	4.6	0.1	0.0	0.0	0.0	1.0	19.0	14.8	0.3	0.0	5.0	0.0	0.0
1991-92	2.4	1.2	0.0	0.0	0.0	0.0	0.4	16.0	14.0	0.1	0.0	2.7	0.0	0.0
1992-93	2.5	1.6	0.0	0.0	0.0	0.1	0.2	26.3	13.1	0.0	0.0	2.3	0.0	0.3
1993-94	0.8	1.7	0.0	0.0	0.0	0.0	0.3	12.0	10.4	0.0	0.0	1.8	0.0	0.0
1994-95	2.4	1.5	0.0	0.0	0.0	0.0	0.3	5.4	8.7	0.0	0.0	1.5	0.0	0.0
1995-96	2.0	1.3	0.0	0.0	0.0	0.0	0.2	4.6	7.0	0.0	0.0	1.1	0.0	0.0
1996-97	3.0	1.4	0.0	0.0	0.0	0.0	0.2	6.3	4.4	0.0	0.0	0.6	0.0	0.0
1997-98	2.4	1.4	0.0	0.0	0.0	0.0	0.0	5.8	4.4	0.0	0.0	0.5	0.0	0.0
1998-99	2.5	1.4	0.0	0.0	0.0	0.0	0.0	3.7	4.4	0.0	0.0	0.8	0.0	0.0

Year	Rice	Wheat	Barley	Oats	Sorghum	Maize	Apples	Grapes, drying	Grapes, wine	Bananas	Olives	Oranges	Potatoes	Soybean
1999-00	1.7	0.0	0.0	0.0	0.0	0.0	0.0	3.8	4.4	0.0	0.0	0.6	0.0	0.0
2000-01	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.7	0.0	0.6	0.0	0.0
2001-02	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	3.0	0.0	0.6	0.0	0.0
2002-03	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.9	0.0	0.6	0.0	0.0
2003-04	1.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	0.0	0.6	0.0	0.0

Appendix Table 5 (continued): Nominal rates of assistance,[a] all agricultural products, Australia, annual, 1970-71 to 2003-04
(percent)

Year	Rapeseed	Sugar Cane	Seed Cotton	Tobacco leaves	Beef and veal	Mutton and lamb	Pigmeat	Chicken meat	Eggs	Milk	Wool	ALL, wted. ave.[a]		RRA
												Cov. Prods.	All prods.&inputs	
1970-71	0.0	23.0	100.0	250.0	1.0	2.0	0.0	0.0	29.0	63.0	10.0	17.5	17.0	-3.9
1971-72	0.0	14.0	6.0	250.0	1.0	2.0	0.0	0.0	35.0	24.0	15.0	12.8	12.0	-7.1
1972-73	0.0	8.0	19.0	250.0	1.0	1.0	0.0	0.0	48.0	24.0	2.0	7.5	8.0	-11.3
1973-74	0.0	7.0	126.0	250.0	1.0	1.0	0.0	0.0	46.0	27.0	1.0	3.9	6.3	-10.5
1974-75	0.0	-14.0	16.0	250.0	3.0	2.0	0.0	0.0	17.0	26.0	2.0	2.4	4.1	-9.4
1975-76	0.0	-13.0	40.0	250.0	3.0	3.0	0.0	0.0	28.0	40.0	1.0	4.5	5.0	-8.3
1976-77	0.0	-9.0	20.0	113.0	2.0	2.0	0.0	0.0	15.0	35.0	1.0	5.4	5.6	-6.8
1977-78	0.0	-4.0	9.0	84.0	2.0	2.0	0.0	0.0	17.0	36.0	2.0	5.9	7.6	-6.6
1978-79	0.0	-3.0	11.0	76.0	1.0	1.0	0.0	0.0	37.0	34.0	2.0	4.3	4.8	-8.2
1979-80	0.0	-2.0	8.0	88.0	1.0	1.0	0.0	0.0	33.0	34.0	1.0	3.1	3.7	-8.4
1980-81	0.0	-8.0	6.0	77.0	1.0	1.0	0.0	0.0	32.0	19.0	1.0	3.6	5.0	-8.0
1981-82	0.0	-2.0	2.0	59.0	1.0	1.0	0.0	0.0	15.0	20.0	1.0	3.7	4.6	-8.1
1982-83	0.0	11.0	7.0	44.0	2.0	2.0	0.0	0.0	51.0	32.0	1.0	8.0	8.9	-5.8
1983-84	0.0	7.0	5.0	55.0	2.0	2.0	0.0	0.0	69.0	38.0	1.0	6.3	5.6	-4.9
1984-85	0.0	15.0	2.0	47.0	1.0	1.0	0.0	0.0	12.0	52.0	1.0	5.6	4.7	-4.9
1985-86	0.0	21.0	1.0	38.0	1.0	2.0	0.0	0.0	29.0	49.0	1.0	6.1	5.3	-4.0
1986-87	0.0	13.0	5.0	16.0	1.0	2.0	0.0	0.0	35.0	54.0	1.0	8.8	8.2	-2.4
1987-88	0.0	13.0	2.0	37.0	1.0	1.0	0.0	0.0	10.0	49.0	1.0	5.8	5.4	-4.0
1988-89	0.0	9.0	2.0	56.0	2.0	2.0	0.0	0.0	9.0	22.0	1.0	4.3	3.9	-4.4
1989-90	0.0	6.0	0.0	41.0	1.0	2.0	0.0	0.0	9.0	24.0	1.0	3.6	3.6	-3.9
1990-91	0.0	10.0	0.0	35.0	0.7	3.2	0.0	0.0	7.0	28.0	10.5	6.5	6.4	-0.9
1991-92	0.0	7.0	0.0	36.0	0.1	0.4	0.0	0.0	2.0	28.0	5.6	4.5	4.4	-2.2
1992-93	0.0	4.7	0.0	61.6	0.2	0.3	0.0	0.0	2.2	19.7	5.7	4.0	3.9	-1.8
1993-94	0.0	3.9	0.0	60.3	0.3	0.4	0.1	0.1	2.5	19.2	4.0	3.7	3.8	-1.4
1994-95	0.0	3.5	0.0	49.5	0.1	0.1	0.1	0.1	3.5	24.0	1.0	3.5	3.8	-0.8
1995-96	0.0	4.0	0.0	39.6	0.0	0.0	0.0	0.0	1.6	18.7	1.6	3.0	3.5	-1.1
1996-97	0.0	4.3	0.0	29.7	0.2	0.2	0.2	0.2	0.4	22.2	1.0	3.1	3.6	0.2

									ALL, wted. ave.[a]		
1997-98	0.0	0.0	0.0	0.0	19.8	0.0	20.5	0.6	2.7	2.9	-0.2
1998-99	0.0	0.0	0.0	0.0	9.9	0.0	17.1	0.4	2.4	2.5	-0.3
1999-00	0.0	0.0	0.0	0.0	0.0	0.0	17.9	0.0	2.1	2.1	-0.5
2000-01	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	-2.0
2001-02	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	-1.9
2002-03	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	-2.0
2003-04	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	-2.0

[a] The TOTAL agric weighted average uses weights based on the unassisted value of production (actual back to 1966, and the average for 1966-69 for earlier years). It assumes all products not shown (which comprised less than 15 percent of the value of farm production) had an NRA of zero, and it includes non-product-specific assistance (including assistance via primary factor and intermediate input markets).

[b] The final column shows the relative rate of assistance as defined on page 8 of the text.

Sources: Productivity Commission (2004 and earlier) and Industry Commission (1995)

Appendix Table 6: Nominal rates of assistance,[a] all agricultural products, New Zealand, annual, 1955 to 2005

(percent)

	Wheat	Coarse grains	Fruit and veg.	Other crops	Beef and lamb	Wool	Milk	Pork and poultry	All ag. (wted. ave.)[a]	RAA[b] (agric rel to manuf)
1955-64	0.0	4.0	0.0	0.0	0.1	0.0	0.2	24.0	**2.1**	**-16.7**
1965-69	0.0	4.0	0.0	0.0	0.4	0.0	0.2	24.0	**2.2**	**-23.9**
1970	0.0	4.0	0.0	0.0	5.8	5.0	-1.0	24.0	**5.1**	**-21.6**
1971	0.0	4.0	0.0	0.0	5.8	5.0	-1.0	24.0	**5.1**	**-22.2**
1972	0.0	4.0	0.0	0.0	5.8	5.0	-1.0	24.0	**5.1**	**-21.9**
1973	0.0	4.0	0.0	0.0	5.8	5.0	-1.0	24.0	**5.5**	**-14.3**
1974	0.0	4.0	0.0	0.0	5.8	5.0	-1.0	24.0	**5.5**	**-14.2**
1975	0.0	4.0	0.0	0.0	16.9	11.0	40.0	24.0	**20.0**	**-2.9**
1976	0.0	4.0	0.0	0.0	16.9	11.0	10.0	24.0	**13.7**	**-7.2**
1977	0.0	4.0	0.0	0.0	16.9	11.0	10.0	24.0	**13.7**	**-6.7**
1978	0.0	4.0	0.0	0.0	16.9	11.0	10.0	24.0	**13.7**	**-6.9**
1979	-15.0	4.0	0.0	0.0	16.9	11.0	10.0	52.0	**12.8**	**-4.8**
1980	-15.0	4.0	0.0	0.0	6.8	10.0	32.0	36.0	**11.7**	**-5.5**
1981	-2.0	4.0	0.0	0.0	12.0	10.0	10.0	35.0	**10.3**	**-6.4**
1982	7.0	4.0	0.0	0.0	22.2	26.0	17.0	42.0	**18.8**	**-1.3**
1983	-7.0	4.0	0.0	0.0	35.8	30.0	18.0	24.0	**23.0**	**0.5**
1984	0.0	4.0	0.0	0.0	35.2	19.0	13.0	1.0	**18.4**	**-3.3**
1985	0.0	4.0	0.0	0.0	30.2	10.0	11.0	14.0	**15.4**	**-5.5**
1986	11.0	4.0	0.0	0.0	31.6	14.0	16.0	34.3	**18.0**	**-1.6**
1987	5.0	0.0	0.0	0.0	10.9	11.0	14.0	44.2	**10.8**	**-4.3**
1988	3.0	1.0	0.0	0.0	9.8	11.0	12.0	35.4	**9.7**	**-3.2**
1989	3.0	2.0	0.0	0.0	4.8	5.0	5.0	32.9	**5.1**	**-6.3**
1990	2.0	1.0	0.0	0.0	3.0	3.0	3.0	24.5	**3.3**	**-8.0**
1991	1.0	1.0	0.0	0.0	0.8	1.0	1.0	26.1	**1.7**	**-8.9**
1992	0.0	0.0	0.0	0.0	0.8	1.0	1.0	19.7	**1.5**	**-8.6**
1993	0.0	0.0	0.0	0.0	0.8	1.0	1.0	16.7	**1.4**	**-8.1**
1994	0.0	0.0	0.0	0.0	0.8	1.0	1.0	22.0	**1.5**	**-6.8**
1995	0.0	0.0	0.0	0.0	0.8	1.0	1.0	29.6	**1.8**	**-6.2**
1996	0.0	0.0	0.0	0.0	0.8	1.0	1.0	18.1	**1.8**	**-5.2**
1997	0.0	0.0	0.0	0.0	0.8	1.0	1.0	22.5	**2.1**	**-4.5**
1998	0.0	0.0	0.0	0.0	0.8	1.0	1.0	15.1	**1.7**	**-3.4**
1999	0.0	0.0	0.0	0.0	0.8	1.0	1.0	19.3	**1.9**	**-2.6**
2000	0.0	0.0	0.0	0.0	0.8	1.0	1.0	5.7	**1.0**	**-2.9**
2001	0.0	0.0	0.0	0.0	0.8	1.0	1.0	7.3	**1.2**	**-2.5**
2002	0.0	0.0	0.0	0.0	0.8	1.0	1.0	17.2	**1.9**	**-1.7**
2003	0.0	0.0	0.0	0.0	0.8	1.0	1.0	21.8	**2.2**	**-1.4**
2004	0.0	0.0	0.0	0.0	0.8	1.0	1.0	29.9	**2.7**	**-0.9**
2005	2.0	0.0	0.0	0.0	0.8	1.0	1.0	24.6	**2.4**	**-1.1**

[a] The TOTAL agric weighted average uses weights based on the unassisted value of production (actual back to 1966, and the average for 1966-69 for earlier years)
[b] The final column shows the relative rate of assistance as defined on page 8 of the text
Source:

Appendix Table 7: Consumer tax equivalent for agricultural products,[a] Australia, 1946-47 to 1970-71

(percent)

	Rice	Wheat	Barley	Oilseed[a]	Sugar	Cotton	Eggs	Butter	Cheese	Dried vine fruits	Tobacco
1946-47	-4	-75	na	na	2	na	4	-23	-13	22	na
1947-48	-20	-66	-72	-9	-19	na	2	-27	-20	30	na
1948-49	-19	-53	-44	44	-18	na	-8	-22	-17	27	na
1949-50	-9	-59	-50	9	-17	na	-8	-29	-24	31	na
1950-51	-27	-53	-53	-1	-25	na	3	-33	-28	5	na
1951-52	-18	-42	-41	10	-8	na	28	-23	-2	11	6
1952-53	-3	-23	-5	1	7	na	14	3	20	20	24
1953-54	13	0	19	26	24	-3	16	0	17	34	58
1954-55	29	12	1	11	26	-14	46	4	28	29	80
1955-56	19	4	21	-3	22	-16	51	24	2	15	48
1956-57	20	4	14	12	30	-36	42	51	61	15	46
1957-58	24	2	-1	18	18	-19	65	89	97	20	46
1958-59	51	9	10	19	39	-33	65	40	2	19	58
1959-60	47	12	27	9	40	2	54	36	37	41	56
1960-61	39	13	38	17	57	-21	75	83	34	46	29
1961-62	30	10	10	5	66	-48	54	65	50	57	64
1962-63	35	17	14	19	53	-19	72	46	40	40	57
1963-64	49	1	7	17	-7	17	62	41	35	36	44
1964-65	46	9	4	13	44	28	111	44	33	42	40
1965-66	44	8	4	17	81	40	159	58	38	51	62
1966-67	31	7	7	18	111	43	115	62	49	54	46
1967-68	38	21	18	7	141	30	159	101	118	51	48
1968-69	49	34	22	5	128	40	231	120	134	72	55
1969-70	53	22	24	16	74	28	189	109	105	84	47
1970-71	86	26	-7	17	58	38	147	87	75	96	47

[a] Oilseeds include only linseed oil

Sources: Lloyd (1993, Table 10.6)

Appendix Table 8: Consumer tax equivalent for agricultural products, Australia and New Zealand, 1986 to 2005

(percent)

(a) Australia

	Rice	Wheat	Barley	Other coarse grains	Oil-seeds	Sugar	Milk	Beef and veal	Sheep meat	Pig meat	Poul-try	Eggs	ALL, wted. ave.
1986	16	10	0	0	0	12	54	0	1	0	0	26	**12**
1987	15	0	0	0	0	12	54	0	1	0	0	9	**9**
1988	3	0	0	0	0	8	13	0	2	0	0	8	**3**
1989	3	1	0	0	0	6	52	0	2	0	0	8	**10**
1990	5	3	0	0	0	9	66	0	3	0	0	8	**14**
1991	2	1	0	0	0	7	26	0	0	0	0	7	**5**
1992	2	1	0	0	0	5	10	0	0	0	0	2	**2**
1993	1	1	0	0	0	4	49	0	0	0	0	3	**10**
1994	2	1	0	0	0	4	40	0	0	0	0	4	**7**
1995	2	1	0	0	0	4	16	0	0	0	0	2	**3**
1996	3	1	0	0	0	4	18	0	0	0	0	0	**4**
1997	2	1	0	0	0	0	19	0	0	0	0	0	**4**
1998	2	1	0	0	0	0	19	0	0	0	0	0	**4**
1999	2	0	0	0	0	0	20	0	0	0	0	0	**3**
2000	2	0	0	0	0	0	14	0	0	0	0	0	**2**
2001	2	0	0	0	0	0	12	0	0	0	0	0	**2**
2002	2	0	0	0	0	0	15	0	0	0	0	0	**2**
2003	2	0	0	0	0	0	14	0	0	0	0	0	**2**
2004	2	0	0	0	0	0	12	0	0	0	0	0	**2**
2005	2	0	0	0	0	0	13	0	0	0	0	0	**2**

Appendix Table 8 (continued): Consumer tax equivalent for agricultural products, Australia and New Zealand, 1986 to 2005

(percent)

(b) New Zealand

	Wheat	Coarse grains	Oil-seeds	Sugar	Milk	Beef and veal	Sheep meat	Pig meat	Poultry	Eggs	ALL, wted. ave.
1986	0	0	0	0	17	0	0	4	32	51	**11**
1987	0	0	0	0	5	0	0	1	78	37	**10**
1988	0	0	0	0	0	0	0	0	57	45	**7**
1989	0	0	0	0	0	0	0	0	45	48	**6**
1990	0	0	0	0	0	0	0	0	57	28	**6**
1991	0	0	0	0	0	0	0	0	57	31	**7**
1992	0	0	0	0	0	0	0	0	48	25	**5**
1993	0	0	0	0	0	0	0	0	40	24	**5**
1994	0	0	0	0	0	0	0	0	49	29	**6**
1995	0	0	0	0	0	0	0	0	56	38	**7**
1996	0	0	0	0	0	0	0	0	47	22	**6**
1997	0	0	0	0	0	0	0	0	44	33	**5**
1998	0	0	0	0	0	0	0	0	20	33	**4**
1999	0	0	0	0	0	0	0	0	25	38	**4**
2000	0	0	0	0	0	0	0	0	20	7	**2**
2001	0	0	0	0	0	0	0	0	-6	27	**0**
2002	0	0	0	0	0	0	0	0	40	7	**5**
2003	0	0	0	0	0	0	0	0	56	-4	**8**
2004	0	0	0	0	0	0	0	0	45	35	**8**
2005	0	0	0	0	0	0	0	0	52	35	**9**

Source: The negative of the consumer support estimates of OECD (2006)

Appendix Figure 1: International terms of trade, Australia and New Zealand, 1949-50 to 2005-06

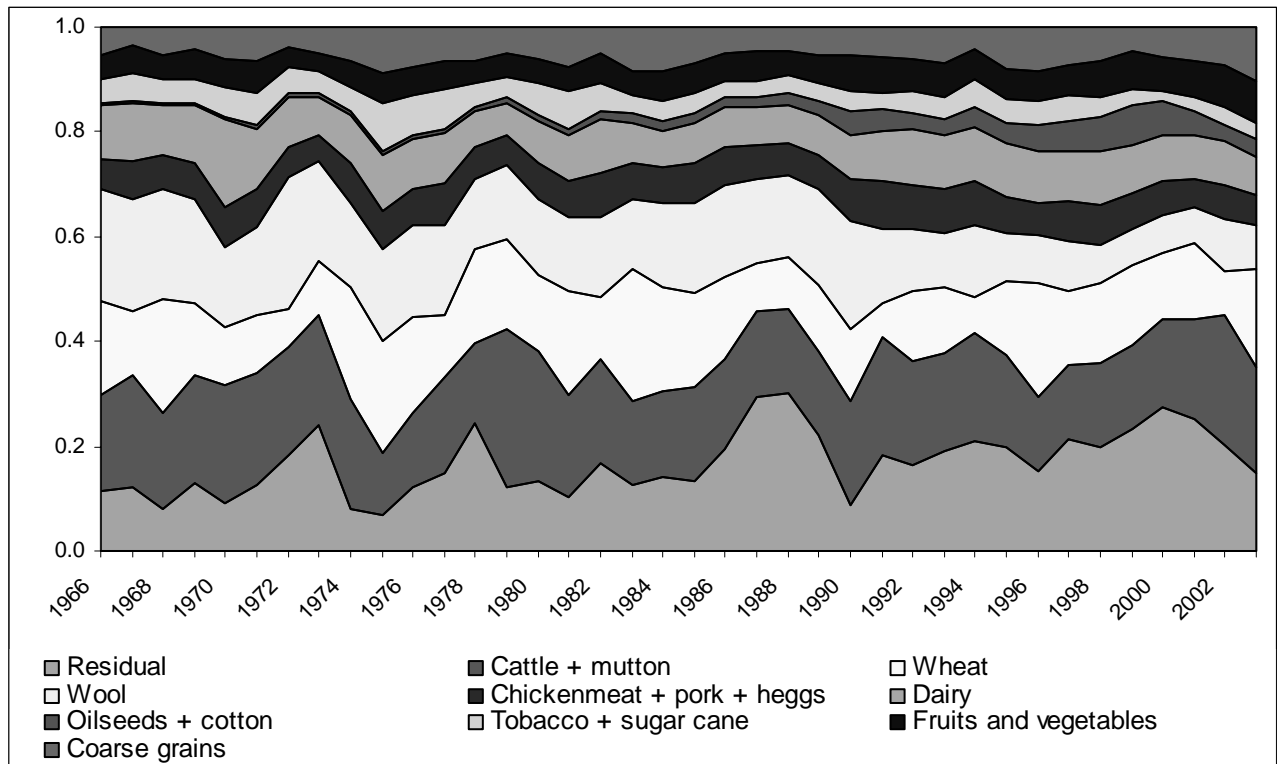(2004-05 =100 for Australia, June 2002 =100 for New Zealand)
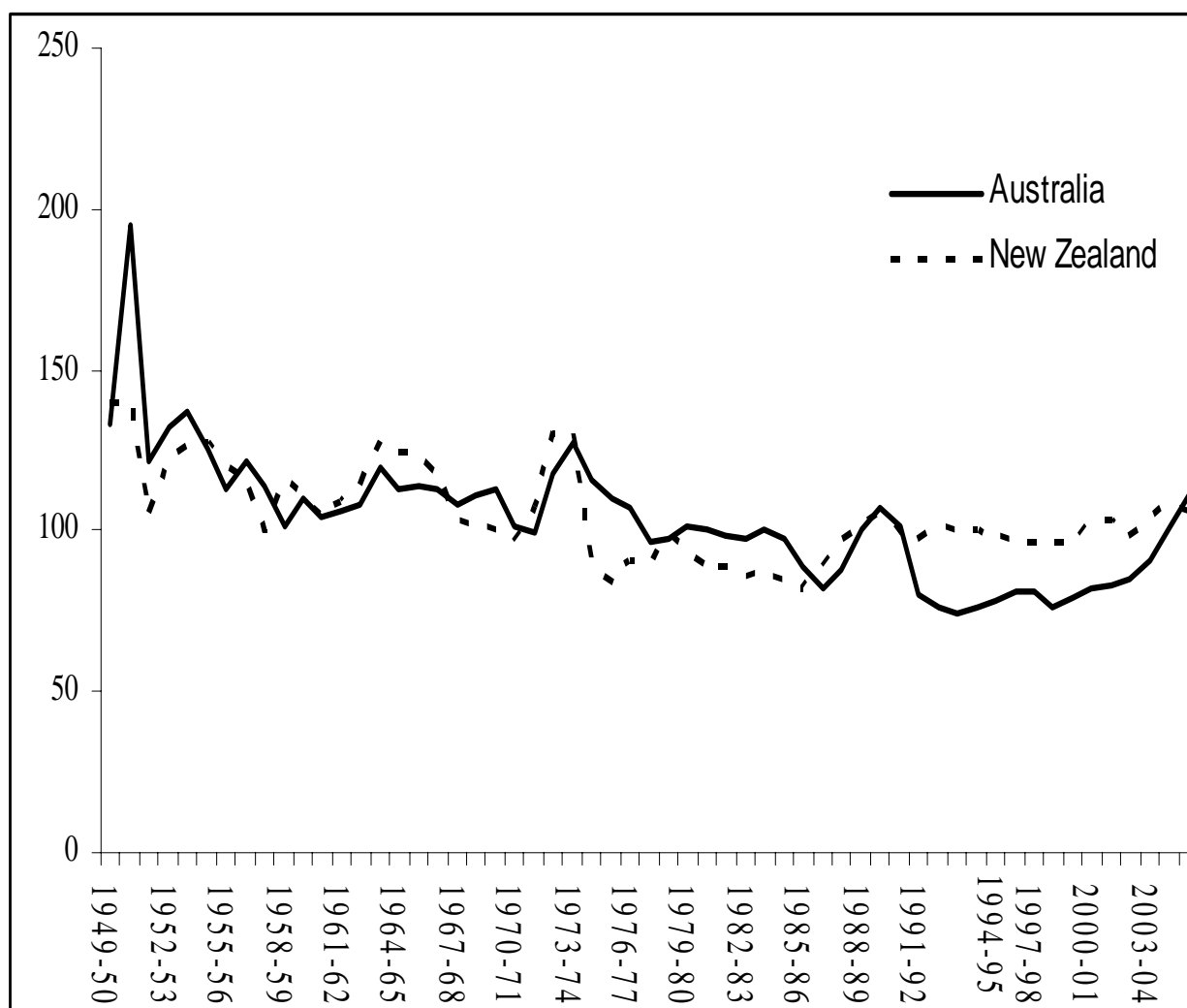
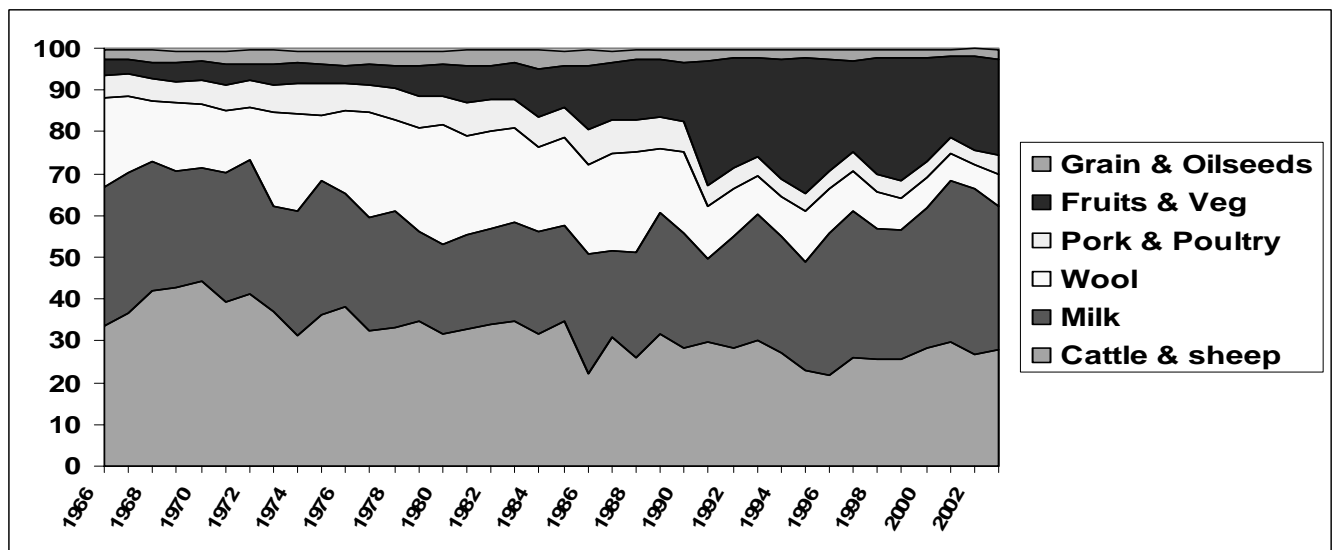^a Ratio of implicit price deflator for goods and services exports relative to imports

Source: ABARE (2007) and

Appendix Figure 2: Industry shares of gross value of farm production at assisted prices, Australia and New Zealand, 1966 to 2003
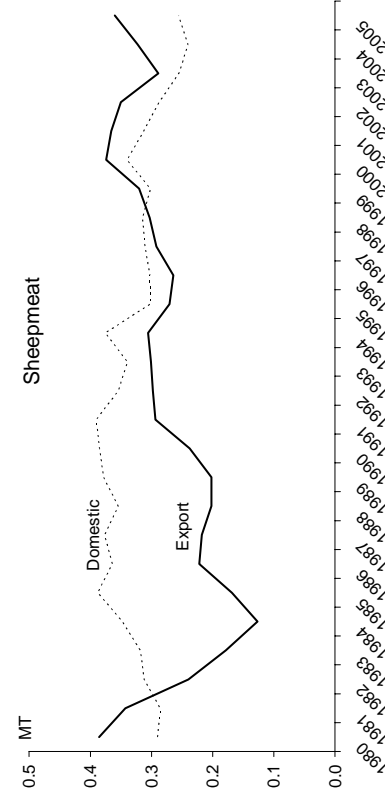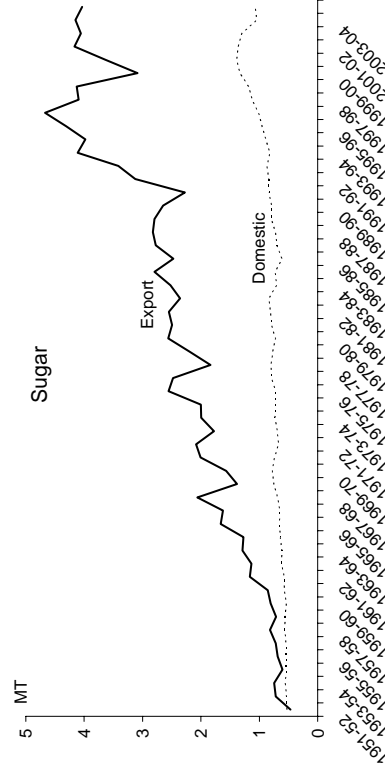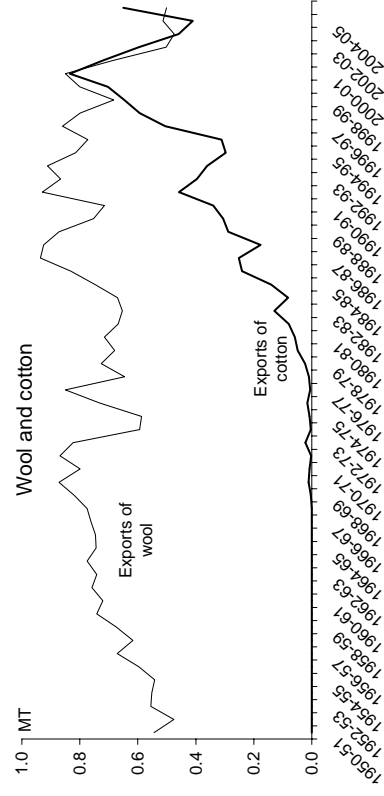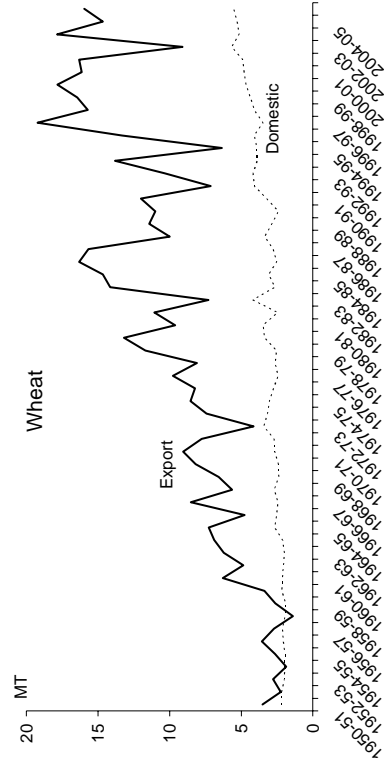
(percent, five-year averages)

(a) Australia

(b) New Zealand

Source: Anderson, Lattimore, Lloyd and MacLaren (2007)

Appendix Figure 3: Volumes of domestic and export sales of selected agricultural products, Australia, 1950-51 to 2005-06 (million metric tons or million litres)
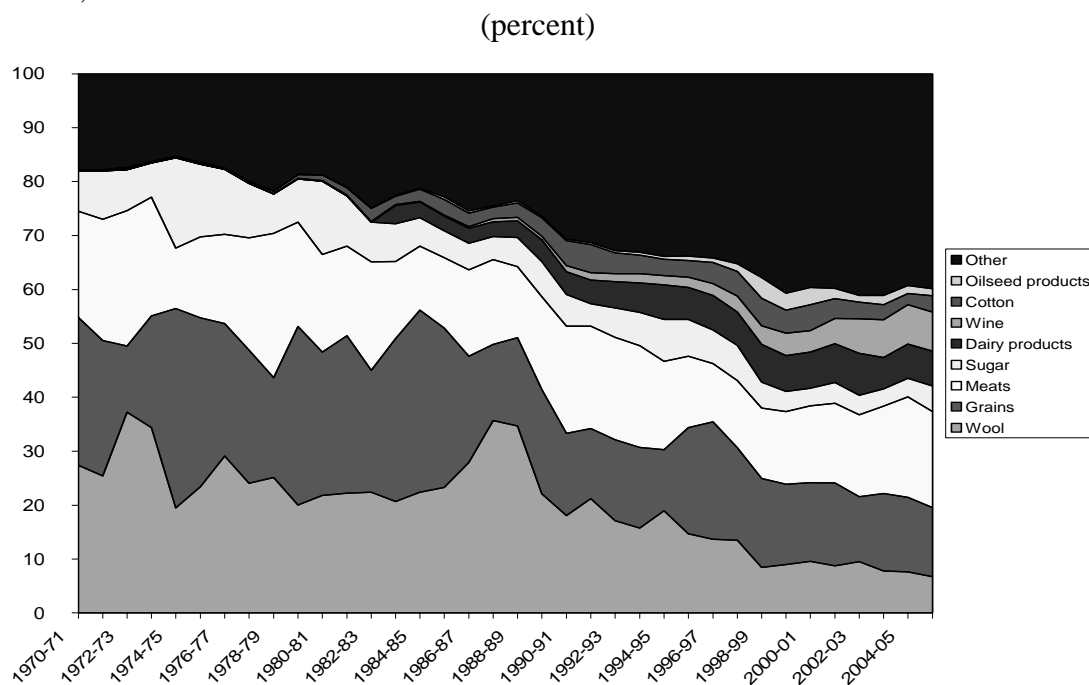
Appendix Figure 3 (continued): Volume of domestic and export sales of selected agricultural crops, Australia, 1950-51 to 2005-06
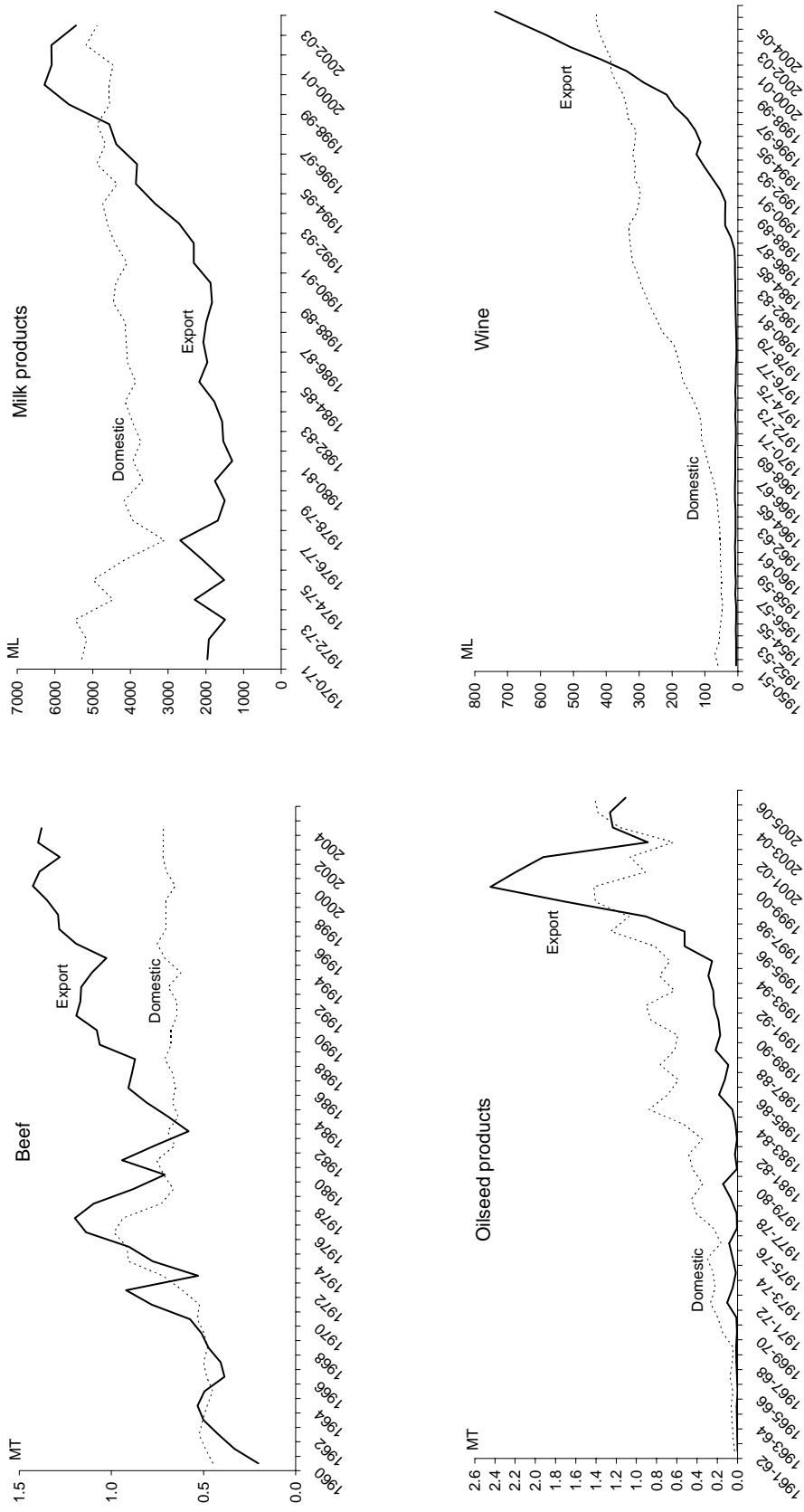
Source: Compiled from data from ABARE (2007 and earlier years), inspired by Productivity Commission (2005, Figure 11)
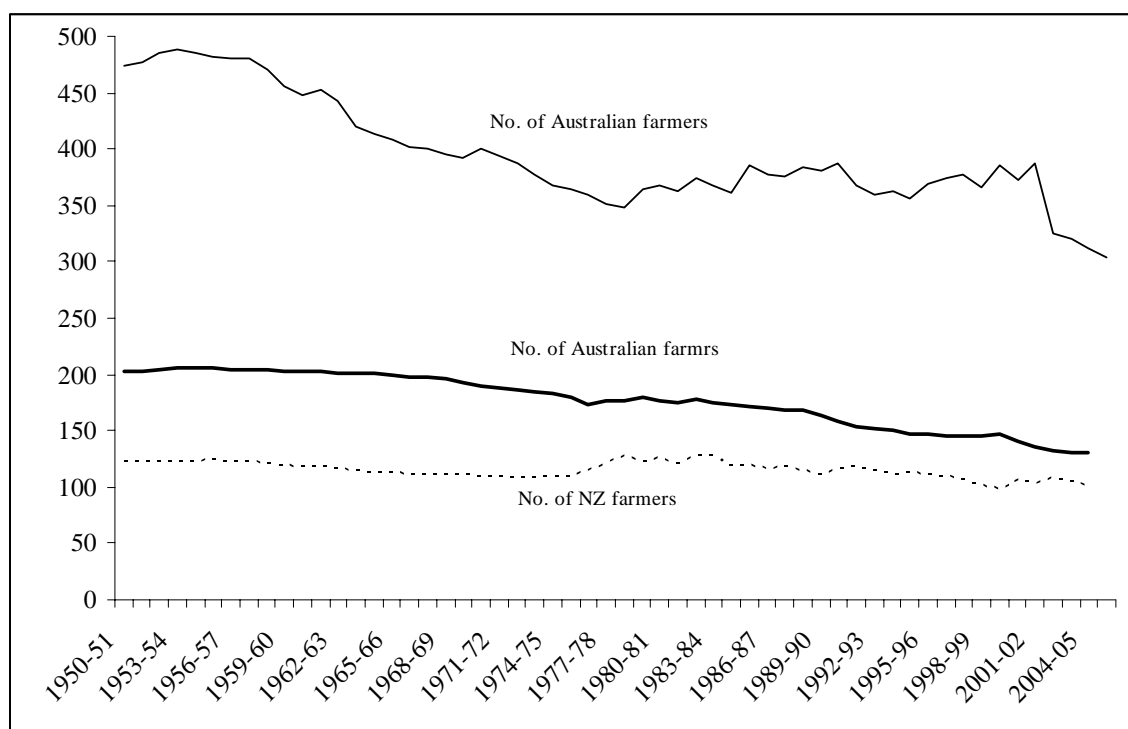
Appendix Figure 4: Commodity composition of agricultural and processed food exports, Australia, 1970-71 to 2005-06

(percent)

Source: Compiled from data from ABARE (2007 and earlier years)

Appendix Figure 5: Number of farms and of farmers, Australia and New Zealand, 1950-51 to 2005-06

(thousands)

Source: Compiled from data taken from ABARE and from NZ Treasury (2007)