

**Agricultural Policy Reform and Industry Adjustment
in Australia and New Zealand**

David Harris and Allan Rae¹

Abstract

Some sectors of Australian and New Zealand farming have been heavily assisted in the past. New Zealand underwent an economy-wide deregulation in the mid-to-late 980s that included abrupt removal of practically all agricultural assistance. Policy reform in Australia has been more gradual and is industry focused, but in some cases substantial industry assistance has been withdrawn. Deregulation of the Australian dairy industry, and that of the sheep and beef sector in New Zealand, are discussed as case studies of these deregulations. Conclusions are drawn from these experiences, a major one being that previously-assisted farmers can successfully make the transition to market-driven agriculture.

Keywords: agricultural adjustment, policy reform, Australia, New Zealand

INTRODUCTION

Politicians and farm leaders sometimes behave as if the removal of subsidies will inevitably lead to the decline and fall of farming. This would seem to ignore the point that agricultural markets adjust to changes in supply and demand as predicted by economic theory. A major thesis of this paper is an obvious one - that agricultural agents, be they farmers, processors or marketers, do in fact change direction in the face of new economic and policy environments. The result is that the decline of agriculture is not as severe as is often feared because adjustment costs are shared between market participants. Short-term declines might even be turned around after a period. This paper shows how this has been the case in Australia and New Zealand, through analyses of selected case studies.

The agricultural sectors of Australia and New Zealand are the least assisted in the OECD. In 2002, their aggregate agricultural producer support estimates (PSEs)² were, respectively, 4% and 1%, compared with the OECD average of 31%. This has not always been the case however. For example in 1986-88, Australia's PSE for milk was 33%, while that for New Zealand's sheepmeat sector in 1985 was 65%. The level of assistance in both these instances had been considerably reduced by 2002, and actually to zero in the case of New Zealand sheepmeat. Yet these industries survived these adjustments and continue to trade competitively on world markets.

The agricultural policy reforms in Australia and New Zealand arose in response to quite different circumstances. In Australia, there have been a number of industry specific reforms over the past 10-15 years. Some reforms involved the liberalisation of trade policies such as border protection measures and market access conditions – WTO and bilateral trade commitments have been a key driver of several policy reforms in recent years. Other reforms were driven by domestic developments such as reforms to domestic marketing arrangements that supported industry returns. Reforms were usually phased-in and announced with an implementation date that gave forewarning of the changes. On some occasions there have been industry requests for assistance. These requests often led to an investigation of the industry circumstances which provide recommendations for regulatory reforms to improve industry competitiveness.

Most of Australia's rural industries face continual adjustment pressures from changes in world prices. Policy reform has been a significant source of additional adjustment pressures in some industries. The initial effect of reduced net returns and lower farm incomes has occasionally led to requests for assistance to off-set the impact of the reform. Over time the response of Australian farmers to these types of developments demonstrates that producers react rationally to changes in their financial situation. Some adjust by exiting agriculture for an alternative vocation. Others choose to switch or diversify into alternative agricultural activities. Producers that remain in the industry make on-farm adjustments to off-set the impact on their net income position.

Australian producers have on-going access to a range of 'safety-net' assistance measures. The objective of these programs is to assist producers in financial difficulty. They are designed to facilitate longer term structural adjustment across the agricultural sector with financial grants for exit assistance, re-training, business advice, etc. These programs are generally available with asset and income tests applied to target assistance to those in most need.

In some cases the Government has responded to requests for assistance by establishing industry specific adjustment programs. If assistance was provided it was transitory and often tied to the implementation of policy reform. Australia does not use longer term assistance measures such as income support payments. Such assistance is not favoured because it dilutes the incentive for change that comes from market price signals. It tends to retard the structural adjustment process which is a key driver of future productivity improvements and industry competitiveness.

In providing transition assistance the Australian Government has made judgements about the impact of reform on producer returns. In some cases the response has largely relied on market forces in conjunction with general 'safety-net' assistance measures. There was no direct producer assistance and market prices dictated the rate of adjustment. In other cases an industry adjustment program was used to provide short term transitional assistance.

Australian industry adjustment assistance has generally been concerned with two types of change. First, there have been programs to assist non-viable producers to either exit the industry or diversify into other agricultural activities. Second, there have been programs to improve producer competitiveness and adjust to lower market returns. Some industry adjustment packages have incorporated both types of programs. Programs aimed at improving competitiveness have included direct producer assistance and/or general industry assistance. Direct assistance usually involved one-off grants to facilitate farm restructuring, business management training, adopting new technology, etc. Eligibility conditions were imposed to target assistance to those in most need. In-direct assistance generally involved project funding to develop the competitive position of the industry for the benefit of all producers.

In the case of New Zealand, reform was far from a gradual process, and was primarily in response to macroeconomic problems. Relatively little government assistance had been provided agriculture in New Zealand up until the mid-1960s. Then, following a number of balance of payments crises, government began the introduction of a range of assistance programs aimed to increase production and foreign exchange earnings. These included input subsidies, market price support, taxation concessions, export incentive schemes, and development grants. The PSE measure for New Zealand agriculture peaked at 35% in 1983 (OECD), and was almost identical to that of the EU.

By 1984 a number of macroeconomic problems had become acute and heavy selling of the New Zealand dollar, which threatened to exhaust the country's foreign reserves, culminated in a snap election in June 1984 and a change of government. The new administration then set about a major reform program. Agricultural support was an obvious target given its transparency, the seriousness of the fiscal deficit, the large size of the agricultural sector relative to the rest of the economy and its export orientation, and the fact that the reforms were being implemented by a Labour government (not strongly supported by farmers). Such assistance was rapidly withdrawn and by the early 1990s the PSE had fallen below 3%.

It is important to realize that New Zealand's reforms were not restricted to agriculture and such wider reforms in many cases eased farmers' adjustment problems. Failure to recognise the latter effects encourages an overly pessimistic view of the consequences of agricultural reforms. These non-agricultural reforms included a 20% devaluation of the New Zealand dollar, and

removal of financial and exchange market controls in 1984 and the floating of the dollar in 1985. Export assistance was removed, tariffs were progressively lowered across-the-board and import controls were dismantled, all with the objective of promoting international competitiveness. Later, the central bank was given increased autonomy in its pursuit of price stability and a 0-2% inflation target (1989), and the labour market was deregulated (1991). The public sector was downsized, and commercial activities of government were corporatised or privatised (including agricultural extension).³

AUSTRALIAN INDUSTRY ADJUSTMENT TO POLICY REFORM

Recent examples of significant policy reforms in Australia have involved the dairy, citrus and pig meat industries. Each of these industries was experiencing adjustment pressures driven by changing market conditions before the reforms were implemented. The government response to adjustment pressures from policy reform has varied. In most cases the response involved public inquiries into the circumstances surrounding the requests for assistance.

Adjustment assistance in the citrus industry primarily was related to a change in trade policy. Reduced protection through progressive tariff reductions for frozen orange juice concentrate (FCOJ) led to increased competition from imports. It contributed to lower returns for orange growers, especially those producing valencia fruit for the processing sector.

There were major differences in the extent of the adjustment pressures based on the scale and production focus of individual citrus producers. The Government response was limited to a small (A\$28.5m) industry assistance program. Requests for direct assistance for restructuring purposes were rejected. Market forces were the key driver of industry adjustment:

- a request for temporary assistance through the WTO safeguards rules was rejected;
- the assistance funded projects designed to reduce direct competition with imports and encourage producers to focus on alternative market segments; and
- the generally available 'safety-net' programs were used to facilitate adjustment.

Adjustment assistance for the pig industry was also linked to a change in trade policy. Reduced import protection from a partial relaxation of quarantine barriers caused a realignment of market conditions to import parity pricing. The industry was exposed to increased competition from imports and fluctuations in world prices. Assessing the need for assistance was complicated by the normal cyclical behaviour of industry returns.

The Government response primarily involved a small (A\$26.2m) industry assistance program. The industry adjustment measures focused on improving the competitive position of producers by developing new export markets where the industry had a potential competitive advantage. Market forces were the key driver of industry adjustment:

- a request for import protection through the WTO safeguards rules was found to be warranted but not implemented;

- requests for direct producer assistance for restructuring purposes were rejected but some assistance was provided for producers to exit the industry;
- project assistance was provided to expand exports – QA, export promotion activities; and
- assistance was provided to stimulate new investment in the processing sector.

Australian case study of adjustment to policy reform

The most significant policy reform implemented in Australia in recent times involved the dairy industry. Adjustment assistance related to the end of all support arrangements affecting the supply and domestic pricing of milk. Deregulation was fully implemented over-night on 1 July 2000. Phasing out the policy arrangements was not a realistic option as the reform affected a range of Federal and State Government legislation with different levels of price support.

Australian dairy policy has a history of providing producer support through a variety of policy arrangements. Regulations created an artificial market separation between fluid milk sales and milk used for manufactured dairy products. State Governments established six separate markets for fluid milk. The Federal Government established price support for manufacturing milk.

Policy reform began in 1986 with changes to the manufacturing milk marketing arrangements. Regulations for pooling export returns were abolished and manufacturers were able to charge higher prices for dairy product sales on the domestic market. The net effect was to raise the price of manufacturing milk above export parity. The reforms included a requirement for support to be reduced from around 40% of average export prices in 1987 to 10% by 2000.

During the 1990s a number of reforms were made to the fluid milk schemes operated by State Governments. The changes involved deregulating post farm gate marketing arrangements. Pricing controls on wholesalers, vendors and retailers were removed. However, farm gate price controls for fluid milk remained in place with each State setting prices at different levels.

Dairy industry adjustment in the lead up to deregulation. There was considerable industry adjustment during the lead up to the initial policy reforms in 1986. A large number of producers exited the industry. In the ten years to 1984-85 farm numbers fell by 11,288 farms (Table 1) and milk production declined. This adjustment reflected a period of relatively low returns in the late 1970s due to reduced export opportunities.

From the mid-1980s the industry became increasingly focused on export sales. Seasonal production of manufacturing milk increased. Industry wide structural adjustment continued as producers responded to fluctuating world prices and the policy reforms. The pressure for adjustment was especially evident in the manufacturing milk sector. By June 2000 the industry had 12,888 dairy farms – 6,454 farms had left the industry since 1984-85, a decline of 33%.

The adjustment involved resource movements out of the industry and on-farm developments to improve producer competitiveness. Some of the livestock and land resources of those exiting the industry were purchased by those who remained in the industry. In other cases land was directed into other agricultural industries or purchased for non-agricultural uses.

Table 1 Pre-deregulation adjustment in the number of Australian dairy farms

Year ending 30 June		1974-75	1979-80	1984-85 *	1989-90	1994-95	1999-00
Victoria	<i>number</i>	14 920	11 467	10 850	8 840	8 379	7 806
	<i>change</i>	..	-3 453	- 617	-2 010	- 461	- 573
NSW	<i>number</i>	4 834	3 601	2 838	2 220	1 911	1 725
	<i>change</i>	..	-1 233	- 763	- 618	- 309	- 186
Queensland	<i>number</i>	4 622	3 052	2 544	1 970	1 746	1 545
	<i>change</i>	..	-1 570	- 508	- 574	- 224	- 201
Other states	<i>number</i>	6 254	3 874	3 110	2 366	2 130	1 812
	<i>change</i>	..	-2 380	- 764	- 744	- 236	- 318
Australia	<i>number</i>	30 630	21 994	19 342	15 396	14 166	12 888
	<i>change</i>	..	-8 636	-2 652	-3 946	-1 230	-1 278

* Start of industry policy reform, July 1986.

Source: Dairy Australia, *Australian Dairy Industry in Focus 2003*.

Producers adjusted by increasing their scale of operations and improving farm productivity. The rate of change accelerated after 1984-85. Average herd sizes and milk output per farm increased considerably. Some farmers increased their land base to accommodate a larger herd. Others developed their pasture base to improve the productive capacity of the farm. There were also improvements in livestock productivity. In 1984-85 average milk yields were 3,340 litres/cow. By 1999-00 yields had increased to almost 5,000 litres/cow. This reflected improved pasture quality, more supplementary feeding and genetic herd improvements.

Restructuring assistance for dairy deregulation. By the late 1990s there was pressure for further policy reform. Legislation for manufacturing milk price support was due to terminate in June 2000. All State Governments were required to review their fluid milk regulations under the National Competition Policy (NCP) review process. It was a key pressure point for deregulation with all reviews due to be completed by the year 2000. The Victorian NCP review was completed in mid-1999 and recommended ending the regulations. Victoria decided to end farm gate price controls in June 2000. This decision made the price support arrangements in other States unviable.

The peak producer body decided an orderly transition was essential. The proposal was to simultaneously end all regulations on 1 July 2000 in conjunction with adjustment assistance to manage the initial impact on producer incomes. The Federal Government announced a \$1.8 billion restructuring package. The package was developed by the industry and refined after consultations with the Government. It included direct assistance based on the expected impact on producer returns. The transition assistance was decoupled and the size of individual restructuring grants reflected the relative exposure of the producer to the two types of support policies.

At the time the package was developed support for manufacturing milk was equivalent to 6-7% of market prices. Regulated prices for fluid milk were 100-150% above manufacturing milk prices. Fluid milk prices were expected to decline substantially with a small premium remaining for year round milk supplies. Estimates of the immediate impact on farm incomes ranged from around 10% for manufacturing milk producers and more than 25% in the fluid milk sector.

Direct assistance was worth A\$1.63 billion. Individual restructuring grants were fixed and based on milk produced in the 1998-99 season. The level of assistance approximated the loss of income that was likely to occur during the first 2-3 years of deregulation. Grants were distributed as quarterly payments over an 8 year period beginning in 2000-01. Several banks offered to convert restructuring grants to a single up-front payment. The total package:

- was funded by a levy of 11Ac/litre on domestic sales of fresh milk;
- included a producer exit program (A\$80m) and regional adjustment scheme (A\$65m);
- gave extra assistance (A\$120m) to fluid milk suppliers a year after deregulation occurred.

Dairy industry adjustment since deregulation. Deregulation accelerated the industry adjustment process that had been evident for some time. After three years 2,234 farms had left the industry, a decline of 17% (Table 2). The impact on fluid milk producers was greater but both sectors of the industry were affected. In Victoria over a thousand producers left the industry. There were 435 retirements in NSW and 420 in Queensland – these states are largely focused on fluid milk sales.

Milk production declined in the first year of deregulation due to poor seasonal conditions and farm retirements. Production recovered in 2001-02 and retirements in fluid milk regions slowed. Adjustment accelerated in Victoria with farm numbers down by 6%, well above the average exit rate of 1.2% during the 1990s. This occurred despite strong prices for manufacturing milk. Improved farm asset values may have encouraged some farmers to leave the industry.

In 2002-03 milk production declined but this reflected severe drought conditions across all regions. Before the drought producers had made adjustments to improve farm productivity in response to deregulation. To off-set the decline in income producers increased milk production. Average output per farm increased by 6% in 2000-01 and almost 14% in 2001-02. The growth was driven by a combination of expanding the scale of operations and improving the productive performance of primary inputs – land and livestock. Average herd sizes increased and some producers purchased more land. Feed input quality also improved – feed supplements, pasture development, etc – as the milk yield of cows and land has increased.

Table 2 Adjustment in the Australian dairy industry since deregulation

Year ending 30 June	Number of dairy farms			Milk production		Production per farm	
	number	change	% change	m litres	% change	'000 litres	% change
1998-99	13 156	- 322	-2.4	10 179	7.8	774	10.5
1999-00	12 888	- 268	-2.0	10 847	6.6	842	8.8
2000-01 *	11 837	-1 051	-8.2	10 547	-2.8	891	5.9
2001-02	11 048	- 789	-6.7	11 271	6.9	1 020	14.5
2002-03 p ^	10 654	- 394	-3.6	10 326	-8.4	969	-5.0

* Poor season and deregulation on 1 July.

Source: Dairy Australia, *Australian Dairy Industry in Focus 2003*.

^ Widespread drought conditions.

p - provisional.

Farm level response to dairy deregulation. Regional survey results from late 2003 showed the adjustments helped farmers to improve their financial situation. It primarily involved increasing milk output from the existing base of land and capital. About 45% of producers increased their herds since deregulation (Harris 2004). This was especially evident in fluid milk regions – more than 80% of producers expanded their herd size.

Increased milk output involved other farm level adjustments. Improved carrying capacity of the exiting land base and acquiring land were the key changes that facilitated herd expansions. Almost 30% of producers increased the area of improved pasture on their farm. About a third of producers expanded their land base. Improved herd productivity also contributed to the output growth. This involved changing stock management practices to increase average milk yields. About 50% of producers made changes linked to improvements milk yields since deregulation. Almost 30% of producers increased the use of grain based supplements.

Diversification into alternative agricultural activities and increased off-farm income were other rational responses to the impact of deregulation. Almost 30% of producer increased off-farm income since deregulation. About 20 % of producers either expanded an existing alternative enterprise or established a new activity. On-farm adjustments affected the long term debt position of many producers. Farm development initiatives required larger borrowings despite the availability of restructuring grants. Survey results indicate that 55% of producers have increased long term debt while a third of producers have either reduced or unchanged levels of debt.

A key aspect of the adjustment process is how the restructuring grants were used. There were no conditions on the use of the grant but farmers had to complete a business assessment that was designed to show how deregulation affected their financial position. Producers were expected to use the grants to make on-farm changes to improve future viability. Converting the quarterly grants into a lump sum was expected to encourage a restructuring response.

Survey results showed that 80% of producers converted their grants to a lump sum payment. Most (80%) used the grants for farm development purposes and/or debt reduction. Some used a portion of the assistance for herd expansion and/or land purchases to expand their scale of operations. In the fluid milk regions the grants was mostly used for pasture developments and equipment purchases to improve the productive capacity of the existing land base.

Impact of deregulation on financial performance. ABARE farm survey data was used to assess the impact of deregulation on financial performance in two representative regions (Table 3). As expected there was a significant impact on fluid milk producers in northern NSW. The average price received declined substantially but production growth off-set the income effects of lower prices. The gross farm income situation has gradually improved since deregulation.

Manufacturing milk producers in northern Victoria also experienced an improvement in gross farm income. Milk output increased and the average price received increased due to strong rises in world prices. Farm cash costs increased considerably after deregulation in both regions. Expenditures on feed, interest and labour increased. On a per litre basis total cash costs were significantly higher in northern Victoria and moderately higher in northern NSW.

Table 3 Change in average farm incomes in selected Australian dairying regions #

Year ended June	Milk	Milk price	Farm	Off-farm	Total cash
	income *	per litre *	income	income	income **
	% change	% change	% change	% change	% change
Northern Victoria					
1998-99	22.1	-2.5	19.8	108.1	21.3
1999-00	3.8	-10.8	7.2	19.1	7.5
2000-01 ^	19.8	25.9	14.7	43.5	15.6
2001-02	42.2	12.4	42.9	-4.1	41.0
2002-03 p ^^	-41.3	-22.1	-33.2	5.8	-32.2
Northern New South Wales					
1998-99	-18.1	-4.3	-13.4	231.5	-7.8
1999-00	16.4	0.2	10.9	-38.3	6.8
2000-01 ^	5.5	-20.7	13.9	55.3	15.9
2001-02	39.4	18.8	29.3	40.6	30.0
2002-03 p ^^	14.6	6.6	13.9	-0.8	12.9

Annual change in average per farm performance.

Source: ABARE, Australian Farm Survey Reports.

Year to year changes in sample size and survey population affect the comparability between years.

* Based on total milk receipts net of freight.

^ Poor season and deregulation on 1 July.

** Derived as farm income plus off-farm income.

^^ Widespread drought conditions.

p - preliminary.

The net cash income situation indicates that producers in northern Victoria have improved their financial position since deregulation. Debt levels increased but debt servicing obligations fell because of large gains in net cash income. The rise in world prices helped manufacturing milk producers to manage the adjustment process. The net cash income position of fluid milk producers in northern NSW has also improved since deregulation although the gain is much smaller. It primarily reflects strong growth in milk production. Debt levels have increased but debt servicing obligations are only marginally higher.

NEW ZEALAND CASE STUDY OF ADJUSTMENT TO POLICY REFORM

Following election of the Labour Government in 1985, most assistance to the agricultural sector was rapidly withdrawn. Subsidised credit (introduced in 1930), grants to encourage pasture land development and its stocking (started in the mid-1970s), and subsidies for fertiliser, weed control and irrigation structures (introduced between 1965 and 1975) were all abolished. Several taxation advantages for farmers, introduced during the 1960s and 1970s, were also withdrawn in the mid-1980s. An export incentive scheme had been introduced in 1963 to encourage diversification away from the traditional farm exports, and this was phased out over 1985-90. All government-provided advisory and inspection services, that had been publicly-funded, were privatised or charged at full cost. The system of supplementary minimum prices, which had characteristics of deficiency payments or export subsidies depending on the commodity, and that

commenced in 1978, were abolished over 1983-86. The statutory marketing boards for wheat, milk and eggs, were also abolished and marketing subsequently deregulated.

Sheep and beef farms were and remain a major component of New Zealand's farm sector, whose outputs comprised 44% of the value of total agricultural output in 1984. They were also the most heavily assisted farm type, with total assistance that amounted to over 38% of the value of farm output in 1983⁴. The following case study, therefore, is largely focussed on this component of the agricultural sector as it bore the brunt of the agricultural adjustment, and also concentrates on the period 1984-90 over which much of the adjustment occurred.

Product market adjustments

Changes in output prices. While the removal of price assistance had a significant impact on farm prices for sheep meat and wool, other factors also played a role. These included foreign exchange rates and domestic price stability, which were also influenced by macro aspects of the reforms. Domestic inflation, which had exceeded 20% during the 1970s, was not substantially reduced until after the passing of the Reserve Bank of New Zealand Act (1989) which gave the central bank increased autonomy in its pursuit of price stability. Hence the marketing margin between *fob* export prices and farm-gate returns tended to increase for much of the adjustment period, exacerbating the negative impacts on farm prices of the withdrawal of assistance. On the positive side, world commodity prices (in foreign currency) increased during the first year of the adjustment period (1984 to 1985) for wool, sheep meat and beef, and at other times during the adjustment period as well. Whether these foreign price movements translated into higher *fob* export returns was influenced by exchange rate policy. The devaluation of the New Zealand dollar in 1984 amplified the impact of higher world prices on farm-gate returns in 1985. However removal of the earlier interest rate freeze and a tighter monetary policy attracted foreign capital to New Zealand due to the increasing interest rates, and the NZ dollar appreciated during 1986 and 1988. In some cases this counteracted increases in world prices, and in others augmented the impact of lowered world prices on farm-gate returns.

These effects are summarized in Table 4, where year-on-year changes in price support are compared with corresponding changes in farm-gate prices. Assistance payments to lamb, for example, peaked in 1984 at 67% of the farm-gate price. This assistance was almost completely removed over the following three years, yet the farm-gate return increased in two of those years. In spite of increased domestic margins, higher world prices and a depreciating currency contributed to this outcome. For mutton, assistance was withdrawn over 1986 and 1987, after peaking at 87% of the farm-gate price in 1985. In total over 1986 and 1987, assistance fell by 78c/kg, while the farm price was reduced by the smaller amount of 34c/kg, due to the mitigating effects of other factors discussed above. Assistance payments to wool did not comprise such high proportions of the farm-gate price as was the case for sheep meat. Nevertheless, assistance comprised 18% of the wool farm-gate price in 1983 and this support was eliminated over the following three years. During 1985 the farm price for wool actually rose due to world price and exchange rate effects, and in the previous year the farm price fell only marginally as world prices had increased that year. Increased world beef prices in 1984 and 1985 more than compensated for the removal of price support for this commodity.

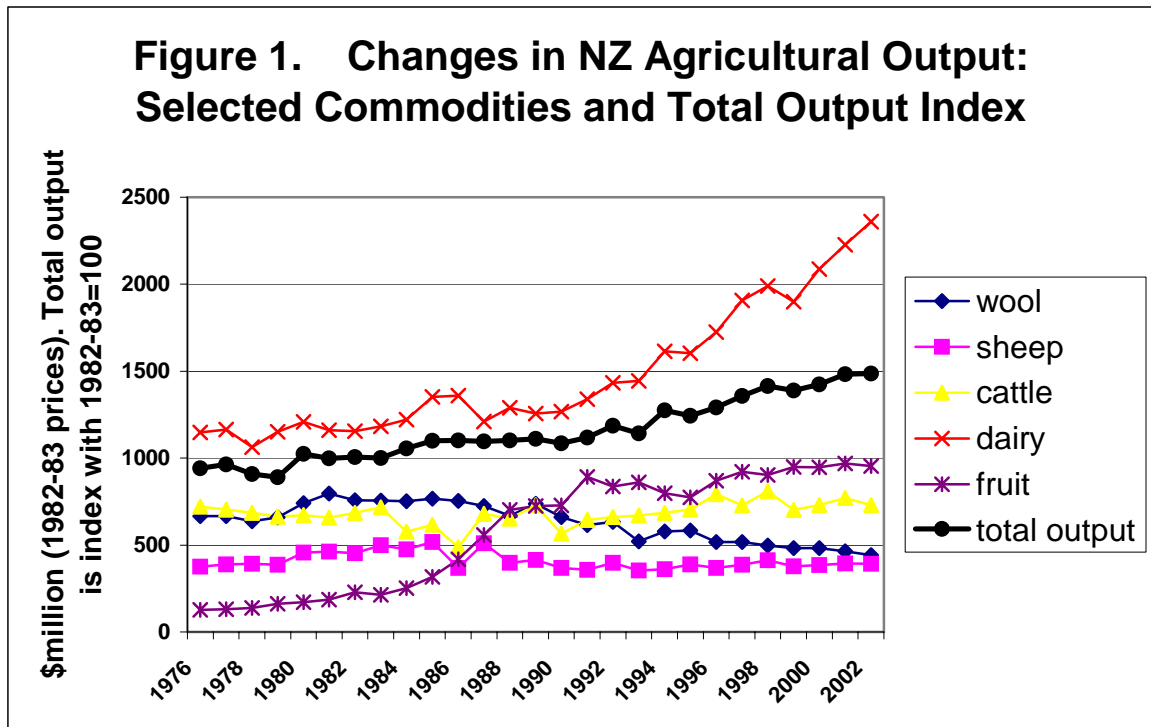
**Table 4 Annual changes in New Zealand assistance payments and farm prices
Nominal NZc/kg change from previous year**

<i>June year</i>	Wool		Lamb		Mutton		Beef	
	<i>Assistance</i>	<i>Farm price</i>	<i>Assistance</i>	<i>Farm price</i>	<i>Assistance</i>	<i>Farm price</i>	<i>Assistance</i>	<i>Farm price</i>
1983	12	0	61	4	7	11	-3	14
1984	-30	-2	24	8	-7	10	-10	7
1985	-19	47	-35	15	70	16	-2	67
1986	-4	-25	-27	-83	-51	-70	3	-71
1987	0	57	-49	57	-27	36	-1	-1
1988	0	34	-6	-41	-1	-2	-1	8
1989	0	54	0	22	0	-2	0	50
Average 1985-89	-4.6	33.4	-23.4	-6	-1.8	-4.4	-0.2	10.6

Source: Sandrey and Reynolds 1990

Changes in farm output. Prior to 1984 price signals to farmers had been disguised, especially by the administered price schemes for sheep meat and wool. The impact of deregulation on the product mix on sheep and beef farms was rapid - the number of sheep declined from 70.3 million in 1983 to 60.5 million six years later with consequent reductions in sheep meat and wool production. To some extent the reduction in sheep stock numbers was replaced by beef cattle and the newly-establishing farmed-deer and goat enterprises - between 1983 and 1989, the number of beef cattle rose from 4.5 million to 4.9 million by 1988, but fell back to 4.5 million the following year. Over the same period the number of farmed deer rose from 0.2 million to 0.8 million and farmed goat numbers rose from 0.15 million to 1.2 million. Since then, the goat industry has all but disappeared, but the deer industry has continued to develop. Using three-year averages based on 1984 and 1990, the volumes of sheep meat produced fell 19% over this period, that of wool fell by 14%, while beef and veal production increased by 10%.

At the aggregate sector level real agricultural output, which had increased during the early 1980s, did not decline over the remainder of that decade when farming was undergoing adjustment to the deregulation. In fact, real output remained largely static from 1985 until 1990. Thus it was the agricultural sector's output mix that changed during this period, rather than total sector output (Figure 1).



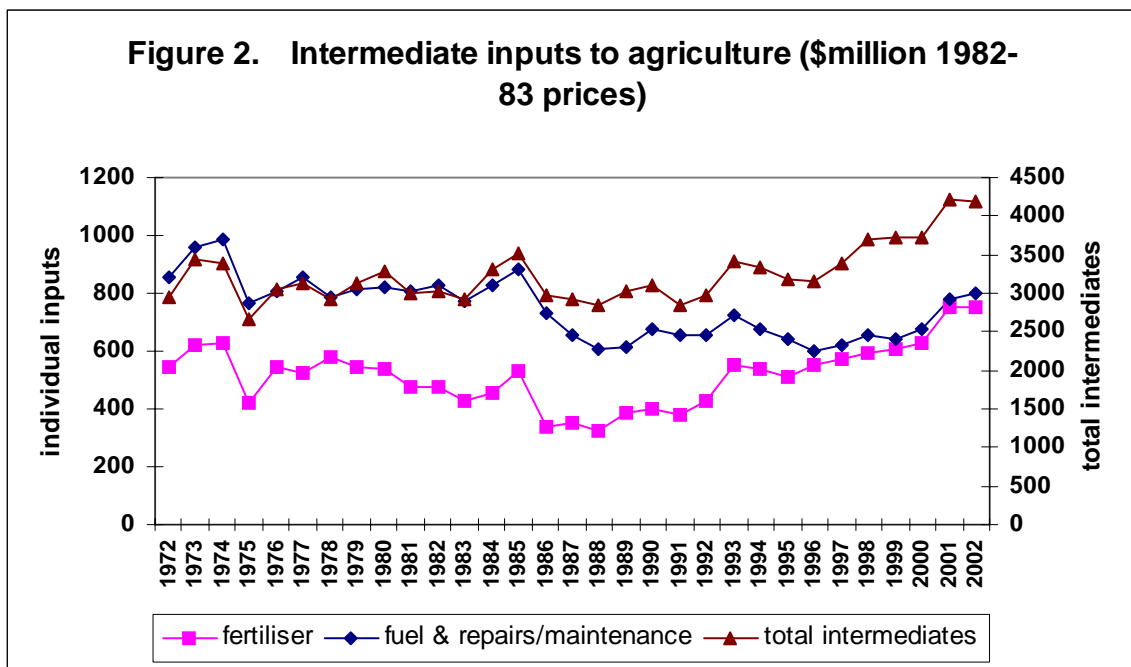
Source: Johnson and Forbes 2000, updated by Forbes (personal communication).

Non-factor markets

Input prices. Assistance to farmers included subsidization of input prices, especially of fertilizer. In 1984, total subsidy expenditures on purchased inputs amounted to 7% of total assistance to pastoral agriculture. But in addition to the phasing-out of these subsidies, another factor associated with the reforms that impacted on input prices was the significant reduction in inflation achieved towards the end of the 1980s due to the tightening of monetary policy. This impacted on the prices of non-tradable inputs to farming, which group accounted for about 65% of farm inputs at that time.

Tariff reductions and the ending of import licensing, along with exchange rate changes, also combined to influence the prices of tradable farm inputs. In some instances, such events offset to some extent the impacts of the removal of input subsidies. Tradable inputs showed the more rapid drop in the rate of price increase, from an annual rate of 19% in 1985 to just 1% in 1989. In contrast, the rate of price increase for non-tradable inputs remained between 5% and 10% between 1985 and 1988, but decreased in 1989 as domestic inflation came under control. (Sandrey and Reynolds 1990, Ch. 8). Thus pastoral farmers, who had seen their index of input prices increasing by over 20% per year during the late-1970s, experienced lower farm input price inflation of 10% per year between 1984-1987, and 3% over the 1987-1990 period.

Changes in intermediate input use on farms. Fertiliser and repairs and maintenance are the major variable inputs on typical sheep and beef farms in New Zealand (both accounted for 11% of total expenses for the average sheep and beef farm in 1985). Expenditure on fertilizer subsidies to pastoral agriculture amounted to \$62 million in 1980, but had reduced to \$6 million by 1987 and zero thereafter. When output assistance and fertiliser subsidies were removed, and as farmers' debt repayments escalated due to increases in interest rates and the phasing out of concessional interest loans, fertiliser expenditure was one of the few areas in which farmers could attempt to reduce cash outlays. Over the period 1980-84, sheep and beef farmers applied on average around 15.5 kg of fertiliser per stock unit - fertiliser application was more than halved from the 1985 to the 1986 season, and remained around 6-7 kg for the next couple of years. Total sales of fertiliser in 1988 were 45% lower than the volume of sales in 1985. Spending on repairs and maintenance was also sharply reduced, and in physical terms decreased by about half between 1985 and 1989. In the aggregate, intermediate inputs to the entire agricultural sector fell by 8% over the 1984-1990 period (Figure 2).



Source: Johnson and Forbes 2000, updated by Forbes (personal communication).

Factor markets

Agricultural credit. Farmers also responded to the deregulation through reductions in capital investment in farming. Capital expenditure had shown strong growth during the 1970s and early 1980s, partly in response to policies on price support and incentives for development including subsidized credit. Interest rates (which had been frozen under the previous government's price freeze) increased sharply with the removal of price controls in 1984 and for many farmers, debt servicing became their major item of expenditure and new investment suffered. The removal of

such assistance since 1984, along with higher interest rates, saw capital expenditure reduced to very low levels. Real investment on farms during 1988 was only 30% of 1984 levels (Sandrey and Reynolds 1990, Ch. 9). Further, the level of new investment was insufficient to offset depreciation, so the total agricultural capital stock also declined.

The demand and supply of credit finance mirrored the reduction in investment just referred to. Agricultural credit fell nearly fifty percent in nominal terms from its 1984 peak but somewhat less in real terms given the high rate of inflation during the late 1980s. A significant amount of debt was written off by private lenders (often families) but the major debt write-offs were orchestrated by the state-owned Rural Bank. The private sector debt write-offs are illustrative of the market adjustments that occur in sharing the burden of adjustment. This burden sharing was reflected in the fact that farm bankruptcies were much lower than had been expected – even by the reforming government itself. The nominal value of agricultural credit did not recover its 1984 level for over 10 years. In large part this is due to the persistent reductions in farm land values that occurred after 1984.

Farm land. The fall in the profitability of sheep enterprises relative to other types of farming led to major changes in land use patterns. Over the decade between 1984 and 1994, the area of grassland under sheep and beef cattle farming declined by 1.93 million ha, or by -16%. Of this, 1.08 million ha (56%) were changed to other grassland uses such as dairy farming and diverse uses that included farmed grassland associated with vineyards, other horticulture, and semi-urban 'lifestyle' blocks. The remaining 850,000 ha of diverted land has been changed to forestry or involved retirement of marginal lands (Davison 1996b).

Farm land prices relative to those of urban land were around 80 percent of their 1981 level at the onset of the reforms in 1984. During the adjustment period, farm land prices fell around 50 percent in regions where sheep production dominated. In predominantly dairying regions, where agricultural subsidies had been relatively light, land prices fell less – by around 20 percent. Land price falls in dairying regions bottomed out in three years but the turn-round in the other regions took longer. Farm land prices then recovered strongly relative to urban residential prices during the 1990s and are currently back to their 1981 relatives, or ahead of urban land prices.

Labour. Labour is a major input to New Zealand agriculture, but it has been of declining importance as a result of long term capital-labour substitution. Over the 1991-2001 period, the total full time equivalent (FTE) workers on farms fell from 117,000 to 115,000. If we take that as the normal decline due to biased technical change then the reforms resulted in an 11 percent drop in farm labour employed during 1986-91.

The farm workforce (FTEs) in 1986 was made up of 53 percent working owners, 40 percent paid employees and the remainder (8,000 FTEs), unpaid family labour. The reforms resulted in an almost equal fall in the number of farmers and paid employees but proportionately, employees fared the worst. In short, there was a tendency for farm employee numbers per farm to fall with a higher proportion of the work being carried out by the working owner(s). This was a short term measure however. Over the period from 1991, farmer numbers continued to fall while employee numbers rose significantly.

The reforms were hardest felt by younger farmers because they tend to have lower equities. In many districts, the number of farmers under 30 years of age fell by 50 percent from 1986 to 1991. The average age of farmers accordingly rose from 43 to 45 years. This trend has continued since 1991 so that the average age is now around 49 years of age.

The wider labour market and waterfront reforms also had significant impacts on agricultural marketing efficiency and productivity. New legislation in 1989 abolished the organisation that operated a national pool of labour for the waterfront (a high proportion of New Zealand's agricultural output is exported), and gave employers the responsibility for negotiating pay and conditions. Comparing 1989 with 1986, the number of waterside workers had fallen by 34% and payout per worker had increased by 45%. Productivity gains are indicated by a 53% increase in tonnage handled per worker (Pomeroy 1990). In 1989-90 conventional stevedoring costs fell by 30% for dairy product loading and by 50% for some horticultural products (Johnson 1991).

The labour market reforms of 1987-1991 have also had profound impacts on the marketing channel, and processing costs and performance in particular. Compulsory union membership was abolished, and greater flexibility was introduced into labour relations by providing employers and employees with more freedom of choice in negotiating terms of employment. In the meat processing sector, agreements with the two major unions were replaced by company or plant-specific agreements, union membership had dropped by a third by 1993, and industrial stoppages dropped markedly (Ellis 1993).

Productivity

It is clear from the above discussion that in the years immediately following deregulation, the level of input use on New Zealand farms declined but the volume of aggregate production did not. Forbes and Johnson (2001) and Johnson (2002) measured agricultural productivity trends up to the year 2002. For the agricultural sector as a whole, total factor productivity grew at the annual rate of 1.0% over the 1976-84 period, when assistance to farming reached its peak. During the 1984-1990 period of adjustment to the withdrawal of such assistance, however, factor productivity grew at the faster rate of 2% per year. The rate of productivity growth accelerated further during 1990-97, to average 2.3% per year. Such enhanced productivity performance, while it refers to agriculture in the aggregate, was likely instrumental in helping the sheep and beef sector in particular to weather the financial stresses of the deregulation adjustment period.

Government facilitation of the farm adjustment process

As agricultural assistance was withdrawn following 1984, it became apparent that marginal and non-viable farm families were not protected by the government's existing social welfare provisions. Therefore specific schemes were devised, including a Special Assistance to Farming program, which was in operation between 1986 and 1989. Provided certain criteria were met, grants were made to farmers who were in a critical financial position to provide for day-to-day living expenses. In this way, farmers and their families received a welfare benefit equivalent

to the unemployment rate (Chadee and Johnson 1994). An Exit Grant scheme was introduced in 1988, to provide assistance to non-viable farmers to encourage them to leave farming.

The reforms lead to rapidly falling land prices, rising interest rates and an increase in farm indebtedness. By 1987, 23% of sheep and beef farms had less than 50% equity compared with 6% of such farms in 1984. Farm lending, at that time, was dominated by the government-owned Rural Bank, and in 1986 this bank introduced a loan discounting scheme. Johnson *et al.* (1989) reported that by 1988 approved applications involved average discounting of 33% of the original debt to the Rural Bank. Walker and Bell (1994) note that for most, debt restructuring and debt write-off followed, although for some selling was the only option - about 20% of the total debt owed by the farm sector was written-off, and about 5% of farms were sold.

Government also facilitated the adjustment process in other ways (Walker and Bell 1994). A Rural Coordinator service was partially funded by government, which worked with local support groups, helped in financial counselling and helped initiate the development of non-farm activities in rural areas. The Ministry of Agriculture established a Rural Affairs Unit to monitor impacts on rural communities, appointed staff to coordinate strategic planning within the sector, funded a Rural Help Directory to advise of locally available sources of help, and funded a series of risk management seminars for farmers.

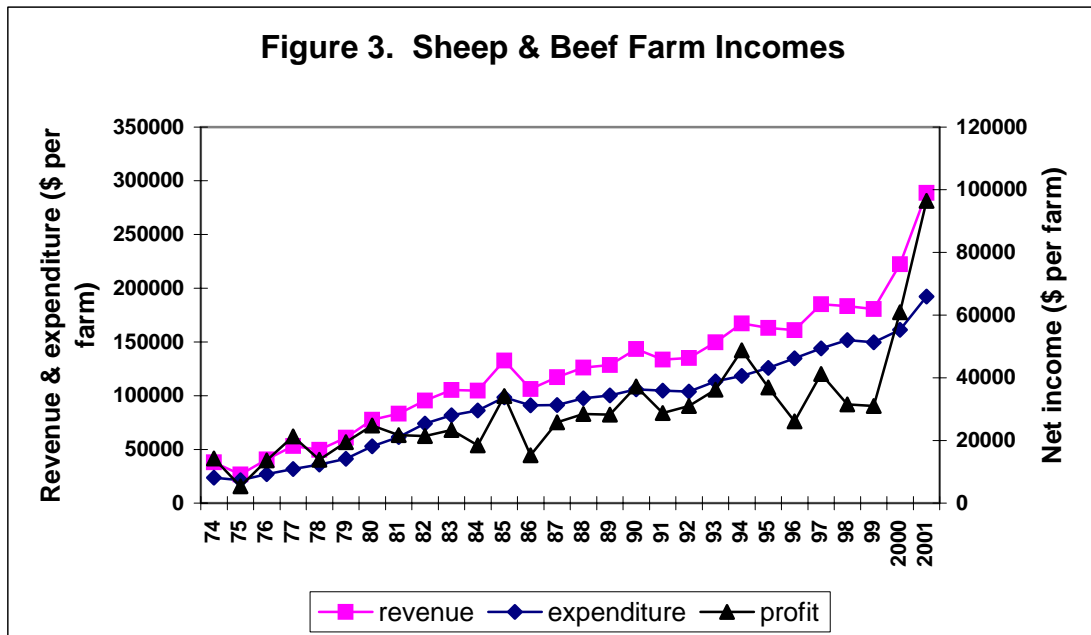
Impacts on farm incomes and sectoral value-added

How did the removal of farm assistance in NZ combine with other factors discussed above to influence farm incomes and sectoral performance? We will first focus on sheep and beef farm incomes which are surveyed annually (NZMWBES)⁵.

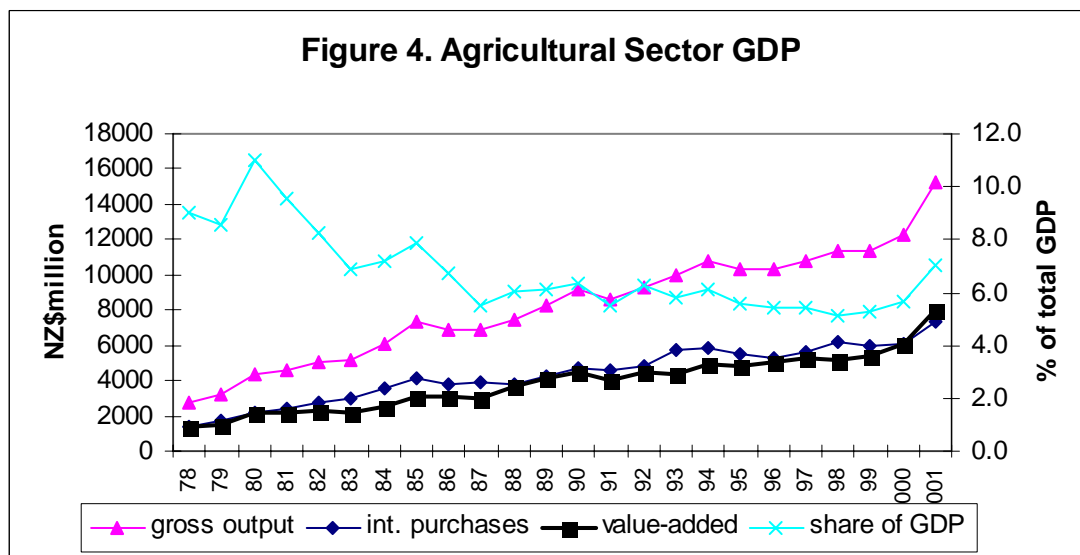
In the year ended 1985, during which the new government's deregulation began, average sheep and beef farm nominal incomes almost doubled from the previous year, and gross revenue increased by 25% despite the decline in assistance payments to wool and lamb output (Figure 3). On the revenue side, this was due to higher world prices, a depreciating NZ dollar, and increased meat and wool production. Increased lamb and sheep slaughter rates over the previous year contributed to the rise in meat production, as farmers began reducing sheep numbers in response to changing relative prices. Farm net incomes plummeted by 55% between 1985 and 1986, however, as the further reduction in assistance to sheep meat output was now augmented by weaker world prices and an appreciating currency. Farmers responded by cutting nominal expenditure by 8% from the previous year, and halved their application of fertilizer. Much of the remaining assistance was removed in 1987, during which time world prices recovered, the NZ dollar depreciated and farm net incomes rose 67% over the previous year. Nominal net incomes then remained relatively stable over the remainder of the 1980s. It was not until the early 1990s that fertilizer use increased on these farms, and more substantive productivity gains were achieved, for example with higher lambing percentages and lamb and beef slaughter weights.

Similar trends are observed at the aggregate sector level (Figure 4). The nominal value of gross agricultural output increased by 20% during the first year of deregulation (1985) for reasons including those explained above along with an increased farm-gate price for milk, but declined the following year. Gross output value then steadily increased until the mid-1990s. Gross expenditure

on intermediate inputs also fell from 1985 to 1986, and remained at that level for a further two years, reflecting lower spending on inputs such as fertilizer and maintenance. Value-added in NZ agriculture was \$3.14 billion in 1985, but declined over the next two years to \$3 billion in 1987. From then to the mid-1990s, agriculture's contribution to GDP grew at about the same rate as the economy as a whole, so maintaining around a 6% share of total GDP.



Source: NZMWBEs



Source: Statistics NZ (PCINFOS)

CONCLUSIONS

The experiences of both countries demonstrate that farmers and others had the scope and ability to make changes in response to reductions in market support. They were able to improve farm profitability above what it would have been had such a reaction not occurred. Farmers have increased their scale of operation, increased productivity by adopting new technologies and improved management practices, diversified their farm business and increased off-farm income.

While policy reform was far from painless, the negative impacts on farm profitability were short-term and transitional in nature. Adjustment was driven by farmer responses to market forces. Income support payments were not used to compensate for the impact of reform on farm performance. Short term assistance was provided to ease the adjustment pressures. The assistance was transitory, decoupled from production, targeted to those in most need and designed to facilitate the adjustment process.

The regional impact of Australian dairy deregulation varied and some farmers decided to exit the industry. Adjustment was evident in both sectors of the industry although the impact was much greater for fluid milk producers. As expected there was a substantial immediate decline in the average price received by fluid milk. The impact on manufacturing milk producers was off-set by strong export prices during the initial two years of deregulation. Producers were aware of the likely impact and began making on-farm adjustments immediately. Changes in the farm income position of producers during this period reflect this adjustment response.

A post-reform evaluation of Australian dairy deregulation shows that farmers were able to make changes to improve their financial situation in response to a major policy reform that was fully implemented overnight. Adjustment assistance was used rationally and helped farmers make the transition to a deregulated market. On-farm adjustment involved two main developments. Producers are running more cows to increase the scale of production. They have also increased the quality and supply of feed inputs to improve carrying capacity and herd productivity. Expanding the land base to support a larger herd has also contributed to the adjustment process.

Several other lessons can be learned from the New Zealand experience. Farmers alone did not bear all the adjustment costs. The farming sector does not face perfectly inelastic supply or demand curves so the burden of adjustment was shared across the markets in which farmers participate. Achievement of macroeconomic stability played an important role in re-establishing agricultural profitability in New Zealand. However, adaptation and innovation in the sector were by far the most important factors in re-invigorating the sector post-reform.

Given time, profitability recovered from the initial shock as asset prices adjusted to lower product prices, outputs changed and demand grew. During the adjustment period government assistance measures played an important role in supporting household family consumption. The adjustments were not instantaneous. Although New Zealand farmers moved quickly in terms of rescuing the profitability of their farms, it took considerably longer for national economic growth to return and general unemployment to begin to subside.

From a political perspective the feasibility of New Zealand's agricultural policy reforms were greatly enhanced because other sectors of the economy were reformed at the same time (Scrimgeour and Pasour 1996). Farmers did not see themselves as the only affected group and they gained benefits from more general reforms such as the reduction in tariff protection for farm input industries. The wider scope of the deregulation meant that efficiency of resource use in the tradable goods sector improved. Manufacturers, farmers and other players began formulating decisions in the face of global market conditions. Resources were redirected towards those products with comparative advantage.

New Zealand policy reforms have also had a positive environmental impact on the agricultural sector. Prior to 1984, subsidies encouraged the development of marginal land, created an incentive for higher stocking rates and encouraged the overuse of fertilisers. Since the removal of assistance chemical usage has declined. At the same time the marginal and easily erodable land has been taken out of farm production.

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1 David Harris is a Freelance Economist with D.N. Harris & Associates and Allan Rae is Director of the Center for Applied Economics and Policy Studies, Massey University, New Zealand. The Australian component of this paper was funded by the Rural Industries Research and Development Corporation (RIRDC) of Australia and their financial assistance is gratefully acknowledged. Paper presented at the International Agricultural Trade Research Consortium Symposium entitled 'Adjusting to Domestic and International Policy Reform in Industrial Countries' held in Philadelphia, June 6 - 7, 2004.

2 The PSE measures the percentage of the value of (assisted) output that is provided by the various government agricultural assistance programs.

3 Fuller accounts of the deregulation are given in Johnson et al. (1989), Johnson (1991), Johnson (1993), Sandrey and Reynolds (1990), Valdes (1994), Sandrey and Scobie (1994), and Johnston and Fregley (1994).

4 Total assistance given to sheepmeat, wool and beef, as a percentage of the value of output of these products (Sandrey and Reynolds 1990, Table 4.2)

5 This is based on a random sample of farms, with at least 80% of revenue derived from sheep and beef cattle. Data presented here are weighted averages over all surveyed farm types and regions. Note that during the 1984-90 period, the average farm size varied between 487 ha and 502 ha.