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The Deregulation of New Zealand Agriculture: Market Intervention (1964-84) and Free Market Readjustment (1984-90)

Warren E. Johnston and Gerald A. G. Frengley

The impacts of deregulation on New Zealand's agricultural sector are examined. Economic liberalization of all sectors of economic activity is the hallmark of current economic policy designs in New Zealand. This is in sharp contrast to previous policies reliant on massive government assistance to and intervention in agriculture. The study provides insights into the cumulative and distortionary extent of previous assistance policies, discusses the rationale in removing public financial assistance, and reviews the readjustment process. As a case study, New Zealand's experience reveals difficulties which may confront farmers in other economies where policy makers seek a return to free market conditions.

Key words: deregulation, economic policies, agricultural policy, structural adjustment.

Economic policy observers ponder the efficacy of making gradual and incremental changes in the policy mix versus a strategy of more sudden abrupt change with little adjustment assistance to those affected. These were the alternatives which confronted the New Zealand government in the mid-1980s when it became evident that social assistance economic policies, for which the country had been well known during the post-World War II period, had both distorted economic sector performances and imposed unacceptably expensive support costs.

A revision of the agricultural support policy was underway in 1983 under the then National government, but in 1984 a Labour government

was elected and subsequently promoted a new economic philosophy. The economic environment changed radically at that time from one which had become progressively reliant on massive government assistance and intervention to one of clearer market orientation, seeking more efficient use of resources throughout the economy. While the thrust of New Zealand's new policy of "economic liberalization" is economy wide, this article seeks only to describe the post-World War II swings in policies affecting agriculture and the extent to which the sector has, or has not, adjusted to the new economic environment.¹

The Post-War Economy

The New Zealand economy was a small, relatively rich economy in the 1950s when, together with Switzerland, it had the third highest per capita GNP in the world. The economy was characterized as having a leading agricul-

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¹ Readers interested in macroeconomic or economy-wide perspectives should refer to Reynolds, Chiao, and Robinson or to several appropriate chapters in Sandrey and Reynolds.

turally based export sector and a small, but highly protected, import substitution manufacturing sector. Pastoral based commodities—dairy products, meat, and wool—dominated exports.

Economic changes in subsequent years proved adverse to maintaining the standard of living, following loss of “favored status” in the United Kingdom market through UK entry into the Common Market and increased international protectionism for pastoral products (Dickinson). It became increasingly difficult to shelter the small economy from external forces, including those of increased international interdependencies in commodity and capital markets. As a consequence, the standard of living could not be supported by government actions over the longer run and, by 1987, New Zealand’s per capita income had fallen to about a third of the per capita income of Switzerland (World Bank).

Agricultural Policy Environments through 1984

The Early Impetus for Assistance

The earlier prosperity was largely attributable to agricultural exports which had provided more than 90% of all export earnings. Real agricultural prices fell through the 1950s, and by the end of the decade serious concern about balance of payments drew the attention of policy makers (Philpott). Decisions were made to “assist” agricultural output expansion because pastoral agriculture was seen to have significant potential to increase production (Levy).

Agricultural Production Targets

During the 1960s, the decline in agricultural commodity prices accelerated, accentuated by increasingly protectionist policies in major markets for pastoral products. New Zealand failed to accept these as long-term trends, regarding them instead as short-term cycles which might be buffered by policies of government intervention. The perceived need was to increase agricultural output. Ten-year output targets for meat, wool, and dairy were established by the Agricultural Development Conference (ADC) in 1963, with the goal of achieving export levels required to “maintain a reasonable rate of growth in the economy.”

At the time, government intervention was limited to indicative planning for the agricultural sector and to the provision of sufficient resources for growth in output. A required livestock increase of 3.5% per year was set in order to reach the target of 111 million livestock “ewe equivalents” by 1972. The livestock target was seen as achievable by the farming community, and the desired rate of growth was achieved through the 1967–68 season. However, farmer confidence was subsequently affected by financial reversals because of inflation-induced cost increases, falling wool prices, and drought during the 1968–69 production season. Output increases were arrested and stock numbers did not change appreciably for nearly a decade thereafter.

Increased Market Intervention

The 1970s can be characterized as the decade in which a variety of incremental policies were called forth in efforts to revitalize growth. Increased funding for extension, research, and quality control was followed by tax incentives to increase stock numbers, by increases in fertilizer subsidies, and by price stabilization policies which included heavily subsidized loans to producer boards. Despite these efforts, livestock numbers increased only slightly from 1968 through the end of the 1979 production season.

The 1978–79 season was a crucial year for agricultural policy change. Supplementary Minimum Price (SMP) payments were introduced to provide confidence to producers in boosting output. Input costs were further subsidized in an effort to offset high internal costs of protected industries, costs of imported inputs, and rising inflation. In addition, concessional financing for farm development increased and expansion activities and further taxation incentives (including loan forgiveness) were adopted as measures to stimulate output expansion. Agricultural assistance continued to grow through the early 1980s despite declining terms of trade for agriculture and rising real interest rates worldwide. Real factor/product price ratios were obscured by the variety of assistance measures, and investment and output performances of the pastoral sector responded to distorted price signals induced by the policies.

Successive New Zealand governments pursued protection and exchange rate policies

which both reduced farmers' returns in domestic currency terms and increased farm costs. Le Heron (1989a, b) provides a useful chronicle of political goals and forms of government interventions that were present through the period 1960 to 1984. Assistance measures required to maintain agricultural viability and export production for foreign exchange were pervasive. The mixture of subsidized farm inputs, farm outputs, agricultural services, and borrowed capital had side effects resulting inevitably in the introduction of further measures with their own side effects (Organization for Economic Cooperation and Development). The fiscal deficit grew as a percentage of gross domestic product, with large increases in foreign debt. By the mid-1980s, New Zealand's per capita GNP had slipped to 25th in the world.

Costs of Market Intervention and the Need for Economic Policy Reform for New Zealand Agriculture

Government assistance had progressed through three phases: first, the indicative planning phase accompanied by assurance of adequate resources (1962–72); second, price and capital subsidies to mitigate rising input costs (1972–79); and third, direct output commodity price support (1979–84). By 1984, there was nationwide recognition of increased levels of fiscal deficit and overseas debt. Restrictive monetary policies and capital rationing had resulted in high rates of interest, and massive levels of financial assistance given to agriculture (and to other economic sectors) were identified as contributors to the nation's adverse economic outlook.

In June 1984 the National government, which had drifted into interventionism and elector disenchantment resulting from those policies, announced the termination of the SMP scheme and the decision to revert charges for producer board accounts at the Reserve Bank to commercial interest rates. A snap election in July 1984 brought the Labour party into power. The new government emphasized monetary and fiscal policies aimed at reducing the inflation rate² and promised economic re-

forms designed to improve resource efficiencies in all sectors of the economy.³ The agricultural sector was to be fully exposed to world market conditions.

Cost of Market Intervention

The withdrawal of financial assistance to pastoral agriculture was not immediate although the policy intent was clear. The cost of financial assistance to pastoral agriculture over the period 1979–80 through 1985–86 was about \$5.7 billion, of which \$5 billion (87%) was expended in the last five years of the period [Johnston and Sandrey 1989; Ministry of Agriculture and Fisheries (MAF)]. Nearly half of the sum (48%) was spent on SMP payments and price stabilization support through producer boards. These payments provided output price support to reduce producer risk for investments in increased output. The majority (93%) of the SMP assistance went to lamb, mutton, and wool producers (Griffith and Grundy).

Capital concessions (interest rates, debt write-off, and special taxation exemptions) accounted for 26%. In the last three years ending in 1984, mortgage rates charged Rural Bank borrowers were at least 5% below commercial mortgage rates (Johnston and Sandrey 1990). Off-farm assistance amounted to 17%, and input cost subsidies were 9% of financial assistance. The compound effect of the policy mix along with government assurances encouraged borrowing in an environment in which there was increased competition for land and confused measures of real farm profitability and equity.

The New Economic Environment

The newly elected Labour party (July 1984) immediately announced a 20% devaluation of the New Zealand dollar and removed controls on lending and deposit interest rates. It then

³ The Labour party was moved to adopt a free market orientation by its Finance Minister (Roger Douglas) setting it, a "liberal" party, in an odd juxtaposition with its predecessor National party, supposedly the more conservative of the two. The National party's role in progressive intervention and assistance over the 1970s and early 1980s served, oddly enough, to place it, with respect to many economic policies, to the left of its opponent. The policy void was to the right, and Douglas committed the Labour party to view its policy package of restructuring agricultural assistance through that "window of opportunity" created in part by the forced devaluation. The cost savings and efficiency gains were expected to assist the funding of the social reforms.

² Inflation had been at double-digit levels for all but one year in the preceding decade.

followed with a November 1984 budget which removed various subsidies and incentives, including a phasing out of fertilizer subsidies, raising Rural Bank interest rates progressively to the market rate, lowering irrigation and water supply subsidies, terminating the investment tax allowance, ending the noxious weeds subsidy, and introducing a cost recovery program for product inspection services (Reynolds, Chiao, and Robinson). Subsequent policies would transfer Crown assets to profit-motivated State Owned Enterprises; phase out land development tax concessions; introduce a flat consumption tax on goods and services; initiate cost recovery for advisory, research, animal health, and agricultural quarantine services; reduce grants and subsidies to agricultural organizations; remove producer board access to Reserve Bank finance; and, in general, move towards eradicating government intervention via financial assistance, regulation, or government ownership of enterprises (Johnston and Sandrey 1989). The latter included the sale of irrigation projects and government-owned financial institutions.

Assistance reform immediately stripped away much of agriculture's protection relative to other sectors while monetary and fiscal policies continued to impose costs on the sector through high interest and exchange rates. Initially the economic reforms had the support of the agricultural sector. The withdrawal of assistance to agriculture and other sectors of the economy was greeted with expectations that exchange rate changes would reflect more favorable on-farm terms of trade, remove off-farm cost excesses, and level the "playing field." Farm incomes fell with the removal of assistance, but off-farm cost excesses did not respond as quickly. Further, the removal of interest rate controls and the appreciation of the New Zealand dollar adversely affected agriculture's exporting sectors after it was floated. For many, the adjustment process has been painful with reduced incomes and reduced levels of production and investment accompanied by rising debt servicing costs and shrinking asset values.

Economic Performance During the Eighties

Table 1 contains selected economic information about New Zealand agriculture during the 1980s. Total agricultural output rose consid-

erably in the first year of policy change (during the 1984-85 season) in part because of a short-lived favorable movement in the exchange rate and the announced termination of price support measures for the following season. The value of agricultural output subsequently fell due to combined effects of low prices and reduced outputs, but it has since risen slowly in nominal terms to \$9.9 billion. In real terms, agricultural output is still lower than levels observed during the first half of the 1980s.

While agriculture continues to be the nation's major exporting sector bringing in about 60% of total export receipts in 1988 (Sandrey and Reynolds), agriculture's share of gross domestic product fell through much of the 1980s. Total assistance to pastoral agriculture increased substantially from only \$23 million in 1970 and \$233 million in 1975, rising significantly to almost \$1.2 billion (a third of the value of pastoral agricultural output) in 1983. The major assistance measures were supplementary minimum prices, producer board subsidies, and interest and tax concessions. Deregulation occurred during 1985. Total assistance was not withdrawn immediately, but it did fall by half within two years. Current levels of direct assistance to pastoral agriculture are low and will decline further. Total assistance as a percent of output and the effective rate of assistance (ERA), a comparative measure of protection and assistance given to other sectors of the economy, both peaked in 1983 and subsequently have fallen rapidly. Pastoral agriculture is now at a net disadvantage to the other sectors; in effect, it no longer receives net assistance, but is now "taxed" relative to nonfarm sectors.⁴

Consumer prices doubled in the first six years of the decade. The rate of inflation has moderated since 1988. The real trade-weighted exchange rate, expected by farmers to swing in their favor as a consequence of changes in economic policies, was stable for most of the early period, except for favorable gains in 1985 largely in response to the devaluation against the U.S. dollar. More recently, the index has deteriorated beyond prereform levels. Real net farm incomes for sheep and beef farms declined throughout the decade, except for the

⁴ A negative ERA indicates that cost excesses (protection) elsewhere within the economy for inputs and manufactured goods used by agriculture exceed total assistance to the sector (Tyler and Latimore).

Table 1. Selected Economic Indicators, New Zealand, 1980-90

	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Total Ag Output (\$ billion)	4.4	4.5	5.0	5.0	5.9	7.6	6.9	6.9	7.6	8.3	9.9
Real 1976 dollars (billion)	2.6	2.3	2.2	1.9	2.2	2.5	2.0	1.7	1.7	1.8	2.0
Agriculture Percent of GDP	10.1	8.8	7.7	6.7	7.0	9.2	7.0	5.9	6.0	5.9	6.9
Total Assistance to Pastoral Agriculture (\$ million)	393	345	750	1,179	1,092	1,060	874	525	558	287	209
As a Percentage of Output	15	13	24	33	30	23	23	13	12	5	3
Effective Rate of Assistance	12	3	49	123	99	40	34	19	15	-1	-6
Consumer Price Index (1976 = 1,000)	1,705	1,973	2,289	2,589	2,700	3,016	3,426	3,998	4,410	4,622	4,898
Real Trade-Weighted Exchange Rate (1976 = 1,000)	1,039	1,023	1,012	1,016	1,004	867	1,024	1,022	1,237	1,171	1,229
Real Net Farm Income Indices											
Sheep and Beef Farms (1975-76 = 1,000)	1,066	807	686	663	503	832	329	475	474	440	433
Dairy Farms (1975-76 = 1,000)	839	797	905	837	838	969	723	592	610	997	1,308
Farmland Values (\$/hectare) ^a	1,395	2,008	2,941	3,128	2,957	3,085	2,793	2,462	2,390	2,508	—
Real 1976 dollars per hectare ^b	818	1,018	1,284	1,208	1,095	1,023	815	616	542	569	—
Real Net Worth of Sheep and Beef Farms Index (1975-76 = 1,000)	1,285	1,423	1,378	1,120	1,117	883	531	524	445	430	448
Agricultural Debt (\$ billion)	3.5	4.2	5.2	5.8	6.8	7.4	8.0	8.5	8.0	7.8	—

Sources: Johnston and Sandrey (1989); Sandrey and Reynolds; New Zealand Meat and Wool Boards' Economic Service (various issues of the *New Zealand Sheep and Beef Farm Survey*, 1989, 1990b); Department of Statistics; Ministry of Agriculture and Fisheries; Valuation New Zealand.

Note: Data are annual, some of which are calendar year, some government fiscal year ending 31 March, and some production year ending 30 June. 1988-90 figures are either provisional or forecasts.

^a Average price of all freehold farmland sold on the open market.

^b Real price per hectare on sales adjusted for quality, size, mix, and types of sales.

upward surge in 1985. In contrast, real net farm incomes for dairy farms, also an important component of the pastoral sector, did not fall as drastically.

Farmland values for freehold farmland sold on the open market increased through 1982 and hovered around \$3,000 per hectare through 1985, despite falling net farm incomes. In real terms, farmland values are now less than half the values attained in 1982. The real net worth of sheep and beef farms declined even further, from an index high of 1,423 in 1981 to only 430 in 1989, a decline of 70%.

Agricultural sector debt more than doubled in the first five years of the 1980s and continued to rise in the first several years following the initiation of the new economic policies. Net debt repayment is thought to have reduced debt in the last several years, but it is clear that the burden of debt is substantial and liquidity low throughout much of the agricultural sector

(Johnston and Sandrey 1990; Johnston and Frengley).

Changes in Livestock Numbers and Land Values

Changes in policy have altered the environment for New Zealand agriculture in each of the past three decades. In table 2, we provide some insights into the effects on livestock numbers and land values by comparisons for representative years: (a) 1965-67, post-ADC target-setting years; (b) 1975-77, years immediately preceding the introduction of the supplementary minimum prices; (c) 1982-84, the last three years prior to initiation of the new policies of economic liberalization; and (d) 1987-89, the most recent years for which we have reliable livestock and land value information.

Table 2. Pastoral Farm Livestock Numbers, Farmland Values, and Interest Rates

	Post-ADC Target Years (1965–67)	Pre-SMP Years (1975–77)	Last SMP Years (1982–84)	Most Recent Years (1987–89)
Average Livestock Numbers (million head)				
Total Sheep	57.4	59.5	70.1	63.3
Beef Cattle	3.9	6.1	4.6	4.7
Dairy Cattle	3.3	3.0	3.2	3.2
Deer	n/a	0.015	0.20	0.61
Goats	n/a	n/a	0.16	1.33
Total Stock Units ^a	84.8	98.8	104.8	101.2
Freehold Farmland Sales				
Number of Farms	3,480	4,044	3,506	2,506
Price per Hectare				
Nominal (\$/ha)	n/a	828	2,692	2,548
Real (1976 \$/ha)	n/a	815	1,057	558
Mortgage Interest Rates				
Commercial Lender Rates				
Nominal (%)	n/a	8.9	14.6	17.9 ^b
Real (%)	n/a	–6.5	–6.4	6.85 ^b
Rural Bank Interest Rates				
Nominal (%)	n/a	7.3	9.0	17.5 ^b

Sources: Sandrey and Reynolds; Ministry of Agriculture and Fisheries; Valuation New Zealand; Johnston and Sandrey (1990).

Note: n/a = not available.

^a In New Zealand a stock unit is equivalent to an adult ewe sheep. Other types and ages of livestock are assigned stock unit equivalents which may range from a low of 0.4 of a stock unit for goats less than one year in age to 6 stock units for an adult cow.

^b 1987–88 only.

Pre-1984 policies consistently sought expansion of pastoral agriculture livestock numbers and investments in agriculture. Financial assistance supported product prices and subsidized input costs. Table 2, thus, shows investment responses to assistance policies and post-1984 adjustments to their removal.

Stock Numbers

Changes in stock numbers on pastoral farms reflect farmer perceptions of optimal stocking rates, given current and expected economic and climatic conditions. Total numbers of sheep increased only moderately after the ADC target setting, but the introduction of the SMP scheme, coupled with land development policies, spurred significant growth in sheep numbers, from 59.5 million in the pre-SMP years to an average of 70.1 million in 1982–84. Sheep numbers have since declined, approaching the pre-SMP level,⁵ with some of the decline because of recent droughts in several production areas.

Beef cattle increased in number in the early to mid-1970s and then went into decline as sheep became more profitable. Through the loss of relative profitability and the effect of a major drought in autumn 1983, beef cattle declined from 6.1 million in 1975–77 to only 4.6 million head in the last SMP years, 1982–84. The expansion since has been modest, affected also by a second major drought of the decade in autumn 1989.

Dairy cattle numbers have fluctuated over the last two decades in the rather narrow range from 2.9 to 3.4 million head. Producer response to the increased profitability for 1989 and 1990 was limited by lagged replacement rates and by the loss of prime North Island areas to horticultural expansion. Some dairying moved to irrigated farms and high fertility pastoral properties, displacing sheep and beef. While the change in dairy numbers was small, the short-term more favorable profit outlook did induce higher productivity per animal and increased volumes of production.⁶

⁵ The 1989 inventory was slightly less than 61.2 million (Reynolds and SriRamaratnam).

⁶ Dairy prices have since fallen to near the levels reported for much of the 1985–88 production years.

Deer and goats, both substitutes for sheep and cattle, have increased significantly. Deer farming did not start until the mid 1960s (goat farming later), although feral animals have long been present in New Zealand. Numbers have risen twenty fold since 1980, but are still comparatively small in total. Deer are more capital intensive than sheep or beef cattle and this slows expansion. Stock availability also may have been a limiting factor. Capital inputs for goats are comparable to those for sheep, and their numbers have expanded rapidly due, in part, to the removal of weed control assistance. Because deer are particularly profitable and goats are required for weed control on more farms, their numbers may continue to expand.

In aggregate, stock numbers and pastoral output were sustained by the assistance measures through the early 1980s against increasingly disadvantageous economic conditions of rising costs and falling commodity prices. Stock numbers increased from 84.8 million in the post-ADC target years (1965–67) to nearly 100 million in the 1975–77 (pre-SMP) period. Stock numbers then rose marginally to 104.8 million for the 1982–84 period and have since fallen, largely reflecting the reduced sheep numbers.

The reestablishment of more normal weather patterns may raise stock numbers somewhat, but reduced production on many sheep and beef farms makes it difficult to service the debt incurred by borrowings under conditions in which financial decisions were distorted by assistance policies. The short-term upturn in dairy product prices lent encouragement to investment in dairying. However, it is arguable that the pastoral sector has been more disadvantaged by the on-going debt attributable to the encouragement created by the assistance than if the assistance had not been granted at all.

Farmland Values

Land prices are affected by changes in product prices, production costs, interest rates, farmers' expectations of future economic conditions, and the political economy. The land market was influenced by the milieu of assistance policies affecting the sector.

The volumes of sales and their price levels are both indicators which reflect changes. The averages reported in table 2 mask even sharper year-to-year variation,⁷ but the downward

trend in transactions is clearly evident. The number of farms sold, which averaged over 4,000 per year during the 1970s, peaked at 5,230 during the 1982 season and then fell significantly as active buyers retreated from the market.

The nominal value of land prices climbed throughout the seventies, accelerated through 1981–82 and 1982–83, and began to fall with the reality of removed financial assistance. In table 2, pre- (1975–77) and last (1982–84) SMP nominal values increased three fold over the period of comparison. Except for one year (1985–86), land values have fallen since deregulation, although there is recent evidence that continued decline in price has likely been arrested. In real terms, the value of pastoral farmland has declined by nearly half from levels last associated with assistance efforts, in the final SMP years, 1982–84.

A long-standing tool for sector expansion had been differential interest rates charged for commercial and agricultural loans. Comparisons of nominal rates show that the differential spread between commercial and Rural Bank nominal rates increased from an average of 1.6% in the pre-SMP years (1975–77) to an average of 5.6% in the last SMP years (1982–84). Real rates of interest were negative for all of the period of rapid land price escalation, 1972–82 (Johnston and Sandrey 1990), averaging about –6.5% in both the 1975–77 and 1982–84 periods (table 2). More recently, interest rates are essentially equivalent for commercial and agricultural loans, and the real rates are positive.⁸ All loans are now made at commercial rates, dampening immediate prospects for farmland value increases and/or substantial increases in the number of farms purchased.

Financial Performance of New Zealand's Sheep and Beef Farms

The New Zealand Meat and Wool Boards' Economic Service (NZMWBS) provides a consistent data base which can be used to evaluate the physical and economic performance

in 1986 and a high of 6,632 in 1973. The variation in sales activity was thus about 50% above and below the average number of about 4,000 sales per year (Johnston and Sandrey 1990).

⁸ From 1985, concessional interest rates provided by the Rural Bank were progressively increased by one percentage point per annum to the market rate of interest, adding to the liquidity problems of farmers who had earlier, under more favorable conditions, borrowed for farm development.

⁷ For example, over the period 1970–87, sales of freehold farmland sold on the open market ranged between a low of 1,928 sales

Table 3. Selected Financial Measures of Weighted Average All Classes Sheep and Beef Farms

Financial Measures	Unit	Pre-SMP Years (1975-77)	Last SMP Years (1982-84)	Most Recent Years (1988-90)
Gross Farm Income	(\$1,000)	40	102	128
Total Farm Expenditures	(\$1,000)	27	81	99
Interest Expense	(\$1,000)	3	14	23
Net Farm Income	(\$1,000)	13	21	28
Real Net Farm Income Index	(1976 = 1,000)	916	618	449
Total Assets	(\$1,000)	296	843	644
Fixed Liabilities	(\$1,000)	50	124	136
Net Worth	(\$1,000)	232	688	466
Real Net Worth Index	(1976 = 1,000)	1,011	1,205	441
Consumer Price Index	(1976 = 1,000)	1,003	2,526	4,643

Sources: New Zealand Meat and Wool Boards' Economic Service (various issues of the *New Zealand Sheep and Beef Farm Survey*, 1989, 1990b); Taylor. A complete table containing annual observations for the 1970-71 through 1989-90 production seasons is reported in Johnston and Frengley.

of New Zealand sheep and beef farms. Selected economic information is contained in table 3. We use the Boards' representative weighted average "All Classes" sheep and beef farm comparisons for three periods: (a) pre-SMP years, 1975-77; (b) last SMP years, 1982-84; and (c) most recent years, 1988-90. All dollar entries are in current New Zealand dollars.

The first five rows summarize aspects of the annual income and expenditure flows. Both gross farm incomes and total farm expenditures increased substantially over the SMP period. Gross farm incomes reached their peak in the 1984-85 production year because of devaluation and favorable commodity markets, then fell by 20% in the following year (1985-86). Despite gradual improvement, it has yet to attain its peak amount in nominal terms, even though the 1988-90 average is higher than for the 1982-84 period.

A large and increasing component of total farm expenditures has been annual interest expense, which increased sharply between the first two periods and has continued to rise since, although the annual level of interest expense fell somewhat in 1989 and 1990, because of debt reduction and lower interest rates.

Net farm incomes in NZMWBS accounts are after interest payments but before drawings, taxation payments, and principal repayments. In nominal terms, average net farm incomes of sheep and beef farms rose for each of the three periods. However, the index of real net farm incomes reveals that the real net income position of farms dropped substantially over the decade of the 1980s, falling by nearly half since the last SMP years.

The next four rows pertain to the capital

structure of New Zealand livestock farms. Total assets rose nearly three fold between pre- and last SMP years and then fell sharply. Fixed liabilities, or long-term debt, have increased, though more slowly since 1982-84. Livestock farms have been working their way out of the massive burden of long-term debt and have reduced it by about 10% since the 1985-86 production season (Johnston and Frengley).⁹

The net worth position of New Zealand sheep and beef farms increased through 1983-84 and then fell precipitously after the 1984-85 year, reflecting the sharp fall in farm real estate and livestock values. The real net worth of farm units which had been relatively stable for most of the 1970s, fell by nearly two-thirds from the last SMP (1982-84) level, though a slight (6%) recovery is now projected for 1990 (NZMWBS 1990b).

Rows 5 and 9 show how the two important income and net worth indices have changed over the past two decades. Real net farm incomes showed weakness in the late 1970s, whereas the declines in real net worth were a much later occurrence. The index of real net farm incomes was, on average, very favorable to New Zealand sheep and beef farms during the 1970s, but as incomes fell, farmers increased farm indebtedness to service financial obligations. Subsequent reductions in net worth followed shortly thereafter. The index of real net worth fell below its base year (1976) level following the 1983-84 year, even though the 1982-84 "last SMP years" average was 20%

⁹ Changes in land values and rural debt outcomes resulting from a sharp decapitalization of land assets since 1984 are analyzed in detail by Johnston and Sandrey (1990).

Table 4. Selected Financial Performance Indicators, New Zealand Sheep and Beef Farms, 1984-88

	1984	1985	1986	1987	1988
Average Sheep and Beef Farm:					
Net Worth Ratio	80	77	69	72	71
Interest as a Percent of Gross Farm Income	16	13	20	19	19
Cash Surplus ^a	-\$7,048	\$4,416	-\$15,732	-\$7,169	-\$13,463
High Debt Farms (<50% equity):					
Percent of Farms	6	10	24	19	20
Net Worth Ratio	35	32	24	27	25
Interest as a Percent of Gross Farm Income	36	30	41	42	38
Cash Surplus ^a	-\$15,672	-\$12,089	-\$42,833	-\$30,729	-\$35,121

Source: New Zealand Meat and Wool Boards' Economic Service (1988a, 1989, 1990a).

^a Net income plus depreciation less drawings and tax and principal payments.

higher than the 1976 base. Fixed liabilities for the sector rose from about \$91,000 per farm in 1980-81 to \$148,000 in 1985-86, an increase of 63% during a period of sharply falling real net farm incomes (Johnston and Frengley). Both real indices are now less than half of base-year levels, and the average real net worth per farm is only about a third of its value at the start of this decade.

Economic Well-Being of New Zealand Farms

Table 4 presents economic performance indicators for the pastoral sector. For sheep and beef farms, there was only one year in the last five in which there was a positive cash surplus before borrowing.¹⁰ Returns for the 1985 farming year were buoyed by very good climatic conditions and the short-term effects of devaluation. Negative cash surpluses, before borrowing, have occurred since. Interest expense has increased to about 20% of gross income. Average equity, which was 80% in 1984, has not recovered much beyond the 69% level recorded in 1986.

The bottom portion of table 4 refers to "High Debt" farms, defined as farms with 50% or less equity. The proportion of high debt sheep and beef farms rose substantially over the period from only 6% in 1984 to about 24% in 1986. The subsequent fall to about 20% is likely attributable to forced farm sales. The net

worth ratio for high debt farms has fallen from 35% average equity in 1984 to only 25%. Indebtedness now amounts to three-quarters of the value of total farm assets of high debt sheep and beef farms.

In 1985 there were no farms reporting less than 10% equity, but by 1987 about 10% of high debt farms, equivalent to about 2% of all sheep and beef farms, had zero or negative equities (NZMWBES 1988b). "High debt" sheep and beef farms have had to direct about 40% of their gross receipts to pay annual interest expenses. Negative cash surpluses have been associated with this subcategory of farms, most recently at levels of -\$30,000 or more per year, a level not sustainable for the long run.

There are differences between economic conditions in the various regions of New Zealand. Particularly hard hit are farms in regions which have simultaneously had to cope with economic policy reform and with drought. A recent Rural Bank study of the financial condition of its customers in North Otago revealed that 18% of farm units there had negative equities in November 1988 (Chappell). And within regions, there is substantial variability in farm performance and financial conditions among farms. In a recent paper analyzing the economic performance of farms in a North Island farming region, Taylor noted that the top 15% of farms were highly profitable with a 10% return on equity capital, the bottom 15% were clearly unsustainable as viable farm units for the long term having a -1.5% return on equity, and the farms in the middle were faced with debt levels which had forced changes in expenditures that could potentially adversely affect long-term viability.

¹⁰ The New Zealand farm accounts define "cash surplus" as net income plus depreciation less drawings and tax and principal payments. The inclusion of noncash depreciation clouds the severity of recent financial conditions.

Overall, a significant betterment in the financial performance and condition of New Zealand sheep and beef farms is not yet evident, although recently there has been an upward revision in the 1988–89 cash surplus estimate to only –\$3,700 (NZMWBS 1990a). Interest payments dominate the decisions of those heavily in debt, and concern has been expressed about the longer-term impacts of lower levels of inputs on future productivity and, thus, enhanced farm incomes. While we would expect lower levels of fertilizer application in the absence of input and commodity subsidies, the recent period of low real incomes has been described as one in which investment in agriculture has been below maintenance (Taylor). In particular, there has been low spending on repairs and maintenance and on fertilizer, with farmers relying on residual soil phosphate reserves in the short run.

Other sectors of New Zealand's agricultural economy have, understandably, also been under financial stress because of terminated financial assistance, reduced income, and increased debt. The kiwifruit industry, which expanded during the 1970s and early 1980s, is like the sheepmeat sector, burdened with problems. A November 1987 survey revealed that 35% of growers had less than 50% equity and that about 8% had negative equities (Moore and Sandrey). The North Otago study revealed that cash crop farms in that area had an average equity of only 4%, in contrast to an average of 35% for sheep farms (Chappell). Both horticultural and arable crop farms also had been targeted for expansion by pre-1984 assistance policies, and have been affected by the shift in policy.

In contrast, there also has been moderate to strong growth in beef, deer, goats, and finewool sheep production in contrast to retrenchments in crossbred sheep farming and static kiwifruit and apple plantings (MAF). The dairy sector has been one in which there had been widely reported price recovery, but world prices for dairy products have since fallen somewhat, dampening further growth in that sector.

Summary and Review of Sectoral Adjustment

For portions of two decades, market signals affecting management and investment decisions of New Zealand farmers were influenced by deliberate government intervention. With

price supports on products, and costs offset by a variety of supplements, optimal financial decisions by farmers were significantly distorted, resulting in exaggerated output and excessive resource use.

With the reversal of previous policies and the commencement of the return to internal free market conditions, problems created by the short-run nature of assistance policies soon became apparent. Farmers who had responded to distorted price signals and had miscalculated long-run risks associated with assistance policies (by using borrowed funds to increase output or expand farm holdings at inflated land prices) were caught, and the inexorable onslaught of reversed financial leverage commenced. Incomes collapsed and debt servicing costs rose.

It is impossible to estimate, in the aggregate and over all farm types, just how many farm units are now or are for the longer term "non-viable." A Reserve Bank of New Zealand assessment of the magnitude of likely adjustments noted that about 10% of all farmers were in a critical financial position and that an additional 30%, largely involved in traditional pastoral farming or in horticultural operations, would have difficulty surviving unless market conditions improved in the following three years. The recent occurrence of adverse climatic events have made even more harsh the realities of restructuring the agricultural sector from one of directed assistance to one with a dominant market orientation. While there has been price recovery in the dairy industry and individual, well-managed and relatively debt-free sheep and beef farming units have been profitable, continued high interest rates, adverse exchange rates, commodity prices, and climatic events have taken a heavy toll on the rural sector.

Thus, the legacy of the readjustment remains. Sheep and beef farmers carrying residual debt are in a precarious position. Nominal and real incomes have improved from the despair of 1985–86, but elevated interest rates and inadequate incomes particularly threaten the survival of one-fifth of all sheep and beef farms with small or negative equities. Negative cash surpluses adversely affect many firms. Six years after the return to market conditions began, insolvent firms continue to farm. The financial problems of the most severely indebted firms have now shifted from the borrowers to the lenders whose investment is at risk. Agricultural support services and processing

plants also have been affected by closure, and rural townships have been severely threatened by business closure and depopulation.

Worse, the intergeneration effect has been especially severe. Young and new farmers who bought farms between 1977 and 1983 and who borrowed heavily at that time have been most seriously affected as a group. Many have become insolvent. In addition, those who provided seller financing have seen their financial plants altered. In particular, intrafamily intergenerational transfers have been stressed because asset-based retirement security has collapsed for many. The average age of farmers has increased as fewer new farmers enter the industry. Interest in traditional, vocation-oriented agricultural education has declined and some training institutions have closed.

The major uncertainties, beyond those of commodity markets and prices, concern governmental monetary and fiscal policies influencing interest and exchange rates and possible changes in the reluctance of creditors to initiate actions against problem loans. The future must include restructuring of many farms to either rid them of excessive debt or to transfer ownerships to new hands at lower levels of investment to foster the emergence of appropriately sized, economically efficient production units more capable of responding to markets.

The New Zealanders' "She'll be right" attitude will not hold without energetic efforts within the rural sector and among financial institutions. Sharply reduced land values may permit new entrants to be lower cost, efficient producers if they are given prudent financial and managerial guidance. More prudent banking practices are sure to emerge from the lessons of the 1980s with less multisource or non-restricted financing and more competitive pressure in financial markets.

Conclusion

There are few equivalent examples of sudden termination of government assistance policies. The New Zealand decision was to abruptly sever and to eradicate the inexorably entwined set of public assistance policies. Adjustment assistance has been minimal for the rural sector.

The speed and extent to which the multitude of adjustment challenges are met is of extreme importance in creating the economically via-

ble, efficient agriculture envisaged for the 1990s by the architects of New Zealand's economic deregulation. The New Zealand position has been that its unilateral disarmament of subsidy policies will make the country better able to competitively take advantage of liberalized trade prospects in a world of fewer distortions. We can only wait to see if the agricultural sector will bear fruit commensurate with the agonizingly slow adjustment to the new policy environment. The fact that the transition has neither been instantaneous nor painless should be readily evident to even the most casual observer.

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References

- Agricultural Development Conference. "Report of the Targets Committee." Report No. ADC 2. Wellington: Government Printer, 1964.
- Chappell, R. J. "A Summary of the Financial Position of North Otago Farms Secured to the Rural Bank." Rural Bank, Wellington, 1989.
- Department of Statistics. Agricultural Statistics; Consumer Price Index 1987; Key Statistics. Wellington. Various issues.
- Dickinson, T. E. "Substitution of Market Signals for Government Intervention in Agriculture: The New Zealand Case." Paper presented at the Annual Meetings of the Western Agricultural Economics Association, Kansas State University, July 1987.
- Griffith, G. R., and T. P. Grundy. "The Supplementary Minimum Price Scheme: A Retrospective Analysis." Res. Rep. No. 191, Agribusiness and Economics Research Unit, Lincoln College, Canterbury, 1988.
- Johnston, W. E., and G. A. G. Frengley. "Financial Stress on New Zealand Sheep and Beef Farms: Analysis of Change in Financial Performance Under Deregulation." *Agr. Finan. Rev.* 50(1990):100-11.
- Johnston, W. E., and R. A. Sandrey. "Land Markets and Rural Debt." In *Farming Without Subsidies: New Zealand's Experience in the 1980's*, eds., R. Sandrey and R. Reynolds. Ministry of Agriculture and Fisheries. Wellington: Government Printer, 1990.
- . "The Emergence of Structural Adjustments in Response to Economic Policy Reform: New Zealand Agriculture in 1989." Paper presented at the Annual Meetings of the Western Agricultural Economics Association, Coeur d'Alene, Idaho, July 1989.
- Le Heron, R. "A Political Economy Perspective on the Expansion of New Zealand Livestock Farming, 1960-84—Part I. Agricultural Policy." *J. Rural Stud.* 5(1989a):17-32.

- . "A Political Economy Perspective on the Expansion of New Zealand Livestock Farming, 1960–84—Part II. Aggregate Farmer Responses—Evidence and Policy Implications." *J. Rural Stud.* 5(1989b):33–43.
- Levy, E. B. *Grasslands of New Zealand*. Wellington: Government Printer, 1970.
- Ministry of Agriculture and Fisheries. *Situation and Outlook for New Zealand Agriculture*. Wellington. Various issues, 1987–89.
- Moore, W., and R. Sandrey. "Adjustments in the Kiwi-fruit Industry." Paper presented at the 13th Annual Conference of the New Zealand Branch, Australian Agricultural Economics Society, Blenheim, 1988.
- New Zealand Meat and Wool Boards' Economic Service. "Distribution of Sheep and Beef Farm Equity—June 1984, 1985, 1986 Compared." Paper No. T114. Wellington. 1988a.
- . "Distribution of Sheep and Beef Farm Equity, June 1988." Paper No. T118. Wellington, 1990a.
- . "1988–89 Sheep and Beef Farm Income and Production Estimates." Paper C342. Wellington, 1988b.
- . *The New Zealand Sheep and Beef Farm Survey: Production and Financial Analysis*. Wellington. Various issues, 1970–88.
- . Unpublished data, 28 April 1989 and 19 May 1989. Wellington, 1989.
- . Unpublished data, 11 January 1990. Wellington, 1990b.
- Organization for Economic Cooperation and Development. *National Policies and Agricultural Trade—Country Study: New Zealand*. Paris. 1987.
- Philpott, B. P. "The Determinants of Agricultural Production in New Zealand." In *New Zealand Farm Production and Marketing*, ed., M. J. Moriarty. Wellington: New Zealand Institute of Public Administration, 1963.
- Reserve Bank of New Zealand. "The Farming Downturn." *Res. Bank Bull.* 49(1986):445–51.
- Reynolds, R., Y. S. Chiao, and B. Robinson. "Macroeconomic Policies and Agricultural Sector Responses." Paper presented to the 33rd Annual Conference of the Australian Agricultural Economics Society, Lincoln College, Canterbury, New Zealand, 1989.
- Reynolds, R., and S. SriRamaratnam. "How Farmers Responded." In *Farming Without Subsidies: New Zealand's Experience in the 1980's*, eds., R. Sandrey and R. Reynolds. Ministry of Agriculture and Fisheries. Wellington: Government Printer, 1990.
- Sandrey, R., and R. Reynolds, eds. *Farming Without Subsidies: New Zealand's Recent Experience*. Ministry of Agriculture and Fisheries. Wellington: Government Printer, 1990.
- Taylor, N. W. "A Review of Current Financial Trends and Farm Incomes in the New Zealand Sheep and Beef Industry, March 1989." New Zealand Meat and Wool Boards' Economic Service. Pap. No. G1996. Wellington, 1989.
- Tyler, L., and R. Lattimore. "Assistance to Agriculture." In *Farming Without Subsidies: New Zealand's Experience in the 1980's*, eds., R. Sandrey and R. Reynolds. Ministry of Agriculture and Fisheries. Wellington: Government Printer, 1990.
- Valuation New Zealand. "Rural Real Estate Market in New Zealand: Half Year Ended December 1987." Res. Pap. 88/2. Wellington, 1988.
- World Bank. *World Development Report, 1989*. New York: Oxford University Press, 1989.