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AGRICULTURAL AND TRADE DEREGULATION IN NEW ZEALAND: LESSONS FOR EUROPE AND THE CAP*

by

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I. *Introduction*

In 1984 the government of New Zealand announced the beginning of a comprehensive plan for the deregulation and desubsidization of its agricultural sector as a part of an equally comprehensive national economic reform. Support programs, which had been in effect for many years and which had been intensified in the late 1970s and early 1980s, were acknowledged to be unsustainable, and their termination was agreed upon. A process for the elimination of specific agricultural schemes was begun.

During the past few years a spate of analyses, mostly of domestic origin, have examined the reasons for, and the significance of, this move by New Zealand. Many of these analyses have attempted to explain how and why the New Zealand economy had reached such a state that such drastic action was necessary (Rayner and Lattimore, 1991; Sandrey and Reynolds, 1990; Wallace and Lattimore, 1987). Others were more prescriptive in suggesting remedies for economic recovery (Bollard and Buckle, 1987; Crocombe, Enright and Porter, 1991; Savage and Bollard, 1990). Most of these studies were specific to the problems New Zealand faced, but few of the books, articles, monographs and consultations were directed toward suggestions for other countries based on "The New Zealand Experiment." It is our purpose here to make one such appraisal: What can Europe and its Common Agricultural Policy learn - if anything - from New Zealand's experience? Are there general as well as specific instructions to be derived by Europe - and other countries - for the improvement of their agricultural and trade policies? And what conclusions can be drawn from the New Zealand case about the deregulating process itself?

II. *New Zealand Agricultural Policy: Evolution and Deregulation*

A. The New Zealand Economy and the Place of Agriculture

The geography, history and culture of New Zealand has a number of unique features which affect agriculture. This island nation is approximately the size of Japan or the United Kingdom (270,000 km) and is situated 2000 km from its nearest neighbor, Australia, between the 40th and 50th parallels in the South Pacific. The climate is temperate, rainfall moderate and the topography very uneven. Until 1973, New Zealand was very closely tied commercially and politically to the United Kingdom, its major market half the globe away.

New Zealand's physical isolation imposed high costs on trade and great advantages in terms of pest and disease barriers. The particular climate and topography has stimulated unique livestock farming systems based on the intensive grass feeding of highly developed grass species to unsheltered livestock. Production systems are also often less intensive in environment-damaging inputs which offers opportunities in the current market environment. The pragmatic traits of New Zealand culture and institutional development have produced valuable targeted technological developments in diverse agricultural enterprises including dairying and pastoral farming, apples, kiwifruit and other fruit and vegetables, as well as deer, goats and racehorses.

The principal components of New Zealand agricultural production are given in Table 1. The largest sub-sectors include dairying, cattle production and sheep production but increasingly fruit (mainly kiwifruit and apples) and vegetables are prominent in the total. By contrast crop production is relatively small, reflecting unsuitable topography as well as technological advances in other areas.

New Zealand has always had a strong comparative advantage in selected agricultural products - especially livestock and horticultural products. Agricultural export competitiveness is most prominent in processed products, meat, dairy products and wool, as shown in Table 2. Unprocessed exports tend to be fruit and vegetables and specialty

seed products. Agricultural development was export market led , by a single market - the United Kingdom, from the early 1800s. New Zealand has a low person-land ratio, giving low domestic demand for food and fiber products. Domestic self-sufficiency ratios (production over consumption) for major agricultural products range from 5 for beef and kiwifruit to 7 for dairy products and 20 for sheepmeats.

The economic linkages between the agricultural sector and the rest of the New Zealand economy are relatively strong. As a result agricultural adjustment tends to be a general equilibrium issue to a greater degree than in many other countries. Agriculturally based products were 57 percent of total merchandise exports in 1991 (having fallen from 80 percent in the 1960s). The share of the agricultural sector in GDP is somewhat larger than in other industrialized countries. It represents around 6 percent of GDP, but with agricultural input supply and processing industries contributing another 6 percent (see Tables 3 and 4). Agriculture contributes more than proportionately to employment in the economy both at the farm and processing levels. The short and long-term financing requirements of the agricultural sector and its allied industries are large relative to the size of the capital market, both because of its capital intensity and its GDP contribution (Rayner and Lattimore, 1991).

The relatively large size and export orientation of agriculture may also imply a relatively weak political position in terms of national development policy. There appears to be greater political support for small import competing sectors of an economy since these sectors are expected to provide significant employment opportunities for the unskilled segments of the labor force. Furthermore, incomes in rural areas of New Zealand have traditionally exceeded urban incomes - one of the very few countries in the world where this has historically occurred. In short, New Zealand has never experienced 'The Farm Problem' to a large degree.

National economic policies have tended to be interventionist in some respects ever since the great depression. However it is important to view these policies within the

context of a small dependent economy. The New Zealand economy was until recently closely tied to the United Kingdom through trade, foreign borrowing, corporate linkages and immigration. The linkages are still strong in the last three areas even though exports to the UK have fallen to around 6 percent of the total. In this environment New Zealand's terms of trade for major agricultural products were, at least to some extent, managed by joint political forces. At their extreme, during World War II, the export prices of major agricultural exports were administered by inter-governmental agreement.

In this environment of relative certainty regarding export receipts, New Zealand exploited its "inelastic" export demand curve, not only by taxing exports directly, but also indirectly by imposing import protection. From 1938 onwards, New Zealand imposed tight import restrictions (import licensing and high tariffs) on all competing goods. These tended to be final manufactures. The motive appears to have been to transfer income from the rural sector to the urban sector - a distributional rather than efficiency aim - particularly through the promotion of full employment, defined to mean unemployment no greater than one percent (Enders, 1984). It was a policy of attempting to mobilize the agricultural surplus (rents) to finance industrial development. Infant industry arguments were also prevalent in both the traditional sense and in a broader context of increasing the diversity of economic activities in a small country with limited natural resources (except for tourism!).

This anti-trade bias in industry policy, beginning in 1938 and which continues today, (Janssen et al., 1991) constituted a tax on exports of varying levels, due to the quantitative nature of the import protection, volatile world export prices and the inflationary nature of monetary policy. As a result, governments found it necessary to ease the pressure on the export sector, including agriculture, from time to time, by giving "tariff compensation" for the low policy-induced internal terms of trade. This was done in a wide variety of ways including subsidies, tax expenditures, regulations, state institutional development and ownership and loan guarantees. One of the most explicit manifestations

of this managed export tax approach occurred during the 1960s. Each year, in the Budget, the Minister of Finance would review the income position of farmers and then announce what subsidies would be added or deleted that year to ensure that farmers incentives were adequate but not excessive.

Economic policy was also interventionist over this extended period in terms of welfare state provisions. This affected income tax rates and the performance of the labor markets. These policies probably did not affect the agricultural sector too greatly because the effective tax rates of farmers were low given the special treatment afforded them as part of the tariff compensation package and because agricultural wage setting was often a special case more attuned to the ability of the agricultural sector to pay. However, the presence and form of the extensive welfare state after 1975 was a major cause of fiscal deficits which were then funded by money creation and the resulting inflation tended to affect primary agriculture adversely.

The welfare state concept may have assisted agriculture in small ways through programs like price controls on bread, milk and eggs. Originally designed as consumer subsidies there is evidence that they were at least partially subverted and ended up benefiting producers instead (Sandry, 1990). For example, wheat prices were set initially to help stabilize bread prices to consumers but ended up being set to stabilize the self-sufficiency level which assisted producers. Wheat prices over this period tended to be higher than potential import prices.

National policy does not appear from this perspective to have conditioned the economy well to cope with the world events of the 1970s. From 1974, New Zealand was buffeted by UK entry into the European Community, the oil shocks, increasing agricultural protectionism, increased policy-induced agricultural exports of meat and dairy products from the EC, and rising real world interest rates. The economy had negative growth rates for much of the period and unemployment became a major problem for the first time since the Depression. Government attempted to deal with the terms of trade decline in an

increasingly interventionist fashion, by increasing investment by the State in industrial projects, increasing tariff compensation to selected parts of the export sector, public overseas borrowing for social spending and income policies with wage price and interest rate controls.

The increasing level of tariff compensation to the agricultural sector is demonstrated by the effective rate of assistance (ERA) measures in Tables 5 and 6. In 1970, the ERA in pastoral agriculture (sheep, beef and dairy production) was -8 percent. The average ERA in 1983/84 was over 100 percent.

The rise in tariff compensation to the agricultural sector was *ad hoc* over this period in much the same way that it had been during the 1960s. As a result the degree of "tariff compensation" varied and peaked in 1983/84. Duncan *et al.* (1992) show that in the early 1980s, the agricultural sector was protected by a true "tariff" at a rate of -11 percent. That is to say, the balance of agricultural subsidization and the added cost burden in agriculture due to import protection effectively taxed agriculture at a rate of 11 percent.

The subsidies to agriculture were not applied evenly across products. As the ERA measures in Table 6 show, sheepmeat and wool received much higher support than beef or dairying during the early 1980s. Non-pastoral agriculture received even less assistance. This imbalance caused a major shift in resources, particularly towards the sheep industry.

By 1984, these policies had stimulated growth to some degree but at high cost. The fiscal deficit was unsustainably high, approaching 9 percent of GDP; foreign debt had risen from 10 percent of GDP in 1974 to over 50 percent; and inflationary pressure was very high, Dalziel and Lattimore (1991). In the weeks leading up to the 1984 election there was a foreign exchange crisis. On the political front public sentiment had moved sharply against the Muldoon Government in part because intervention had moved to extreme levels, Rayner and Lattimore (1991).

B. Reforms in General Economy and in Agriculture

Even before agricultural subsidization had peaked in 1983/84, policy initiatives had begun to change the overall industrial policy away from its 40 year trend. In 1981 an import licensing tender system was introduced, to begin to make explicit the nominal rate of import protection with a view to eventually removing these licensing provisions. On the tariff compensation side, it was announced prior to the 1984 election that the supplementary minimum price (SMP) scheme would have to be removed on grounds of fiscal cost and because market surpluses in sheepmeats were developing as a result of the level of subsidization. Furthermore, international pressure in the form of countervailing duty action by the United States on New Zealand lamb exports was an additional stimulus to subsidy removal.

From 1984 to 1990, the fourth Labor Government embarked upon a broad range of economic policy changes. These are described in detail in Bollard and Buckle (1987), Sandrey and Reynolds (1990) and Johnson (1991). In general, the reforming government chose to liberalize the capital account first together with the production and export subsidy portions of the current account. That is, capital markets and the foreign exchange markets were deregulated almost immediately in response to the foreign exchange crisis and the degree of non-price rationing in capital markets. Agricultural subsidies were removed over a two-year period. These included interest rate, fertilizer and other input subsidies, deficiency payments on sheepmeats and wool and export subsidies. Import protection was adjusted more slowly, and later. Reforms and deregulation of the public service, state owned enterprises, privatization and labor market reforms occurred much later. In fact labor market reforms had to wait until the National Party was re-elected in 1990. The main categories of subsidy and regulation changes are given in Table 7, and as already pointed out, the specific agricultural subsidy programs that were changed are listed in Table 5.

Thus, New Zealand began in 1984 an accelerated policy of deregulating its agriculture and its general economy. Desubsidization was at the center of this policy. Though the non-agricultural sectors of the economy have yet to be liberalized to the degree of agriculture, there is movement in that direction. As of 1992 farming is not now in the economic bind to the degree it was in the years immediately following deregulation.

III. *Deregulation of New Zealand Agriculture: Reaction, Results, and Effects*

A. Analysis of the "fallout" from 1984

Prior to 1984, government policy towards agriculture had as one objective to stabilize business risk in the belief that stability would induce greater investment and thereby increase growth. However, these policies of guaranteed prices, tax concessions and low real interest rates led farmers to increase their exposure to financial risk (Johnson, 1989). Becoming highly leveraged was painless for farmers in the late 1970s and early 1980s. Their asset prices were inflated by subsidized income streams which were highly capitalized under the then prevalent low interest rates (Johnston and Frengley, 1989).

This put farmers in a vulnerable position when, simultaneously, macro-economic policies favored high interest rates, and agricultural (and fiscal) policies increased farm business risk by ending guaranteed prices and subsidized inputs. To add to this burden, world food prices were declining in 1984 and bottomed out in 1986. the year when the policy decisions of 1984 reached fruition.

In such a situation it might be expected that there would be a massive exit from farming. Even official thinking seemed to accept this view, with Prime Minister Lange suggesting (*ca.* 1986) that 5000 farmers (approximately 7 percent of the total) would have to leave the land. Unfortunately there are no comprehensive data on forced exits from farming to test the prediction of a massive exodus. However, the fragments of evidence suggest a much less costly adjustment. Chadee and Johnson (1990) report that bankruptcies for "land related occupations" - which includes farming - increased from 64

in 1981 to 142 in 1986. A 1988 government welfare package encouraged about 300 farm families to leave the land.

Adjustment costs were lower *ex post* than expected *ex ante*. This was partly due to debt restructuring initiated by the government-owned Rural Bank (see Section III-D). However, a more complete explanation would include: more balanced macro policies from 1990 which lowered interest rates, and the real exchange rate; farmers adopted debt repayment strategies; and, real asset values began recovering after 1988 (see Section III-C). Figure 1 illustrates various financial leverage ratios for 'average' sheep and beef, and dairy farms. The sources for these data are farm-level surveys by the Meat and Wool Board Economic Service and the Dairy Board, both of which report results for weighted averages across land use types for the sheep and beef, and farm sizes for the dairy. (These averages do not reveal some important distributional aspects which remain outside the scope of this paper.) Sheep and beef farms saw the greatest change in financial leverage with fixed debt increasing from a low of 14 percent of equity in 1980/81 to a high of 36 percent in 1985/86. This dramatic change partly reflects the bias in subsidies towards sheep and consequently greater inflation in sheep and beef asset values from 1978-82. Net worth was below 50 percent for one-quarter of the sheep and beef farms in this year (1985/86), and five percent had negative net worth. Sheep and beef farmers also had difficulty servicing their debt in 1985/86 when interest expenses were one-fifth of gross farm income. In that same year, net earnings before interest and taxes were only 170% of interest expenses for the average sheep and beef farm, indicating serious cashflow difficulties (Johnston and Frengley, 1989). Dairy farm incomes fell by a much smaller amount in 1985/86 so interest expenditure was only 16 percent of gross revenue.

Figure 1 shows that financial stress has been reduced since 1985/86. In particular, the fixed debt to equity ratio had fallen back to an early 1980s level of 21 percent. The average sheep and beef farm reduced mortgage commitments by more than it increased them in 1986/87, 1987/88, and 1988/89. (This would also have occurred in 1989/90 but

for the $25,000/farm increase in mortgage by mixed cropping farms who respond to different shocks than the rest of the sheep and beef sector.) Real land prices for the fattening and grazing land used by sheep and beef would also show a fall in the cost of debt servicing: in the year to January 1992 interest costs for sheep and beef farms fell by 23 percent, leaving to the first ever decline in the overall input costs index (NZMWBES, 1992).

Whilst it is too much to say that New Zealand farms are now booming, they are certainly more numerous and healthier than was expected in the middle of the reform period. It is instructive to compare forecast data used by Johnston and Frengley (writing two years ago) for the 1989/90 year with actual data. Instead of sheep and beef farm net worth being $499,600 it was $690,918, leading to an actual long-term debt to equity ratio of 21 percent instead of the forecast 26 percent. Net farm income shows a similar improvement, being 29 percent above forecast. These income levels are, however, still very low when measured by the standards of the 1970s or by the standards of international competitiveness. The strategies that farmers used to survive the years of financial stress are described in Section III,C below.

B. Terms of Trade Changes

Conditional farmer support for desubsidization (but not deregulation) was based on their identification of two sources of injury: overseas agricultural policies and domestic industrial policies. These combined to produce falling output prices and increasing input costs from the protected import-substitution sector. Farmers experienced declining terms of trade of -4.2 percent per annum from 1975/76 to 1983/84 (measured using sheep and beef input and output prices). Since then the annual decline has only been -0.7 percent and this includes the high prices received in the starting year, 1984/85 (boosted by devaluation and high world prices).

Overseas agricultural policies have not changed markedly but domestic policies have, which is reflected in falling input costs as inflation targets are achieved. This

suggests that farmer support for the reform program was probably warranted. However, an alternative sequencing may well have made the adjustment costs less painful. The overvaluation of the (internal) real exchange rate saw the output price of agriculture (and other tradeables) decline relative to that of home goods. There was a 30 percent decline in internal competitiveness for agriculture between 1985 and 1988 (Janssen, Scobie and Gibson, 1991). Mobile resources moved out of agriculture and into the production of home goods, especially finance. Most concerning for future output growth was the decline in agriculture's share of new investment; down from a pre-reform share of 14 percent to only 7 percent. (These data are for the broadly defined agricultural sector which includes food processing.)

Thus, any comparative analysis for Europe using the New Zealand experience must discount the costs to agriculture resulting from the particular sequencing of macro economic stabilization. Farm reform in Europe is less likely to be accompanied by a stabilization attempt.

C. Effects on the Farm Sector

1. Aggregate changes in farm numbers

In discussions about the reform of agricultural policy, farm leaders like to emphasize that liberalization would lead invariably to a considerable decrease in farm numbers. However, data for the farm sector in New Zealand since liberalization do not support this statement. Indeed, sheep numbers have fallen by 15 million, down to 57 million which is the same sized national flock as in 1966. Two decades of policies aimed at expanding pastoral output by guaranteeing incomes and reducing investment costs appear to have had only an ephemeral impact.

The data for total farm numbers are subject to Department of Statistics reclassifications of what constitutes a farm. Notwithstanding this, Figure 2 shows that the total number of farms increased steadily between 1976 and 1989. In 1976 there were about 67,000 farms in New Zealand. In 1989 this number had grown to 82,000, but

decreased slightly to 81,000 in 1990. It is obvious that liberalization does not coincide with a marked turning point in New Zealand farm numbers.

The development within different farm types differs widely. Figure 3 shows that the numbers of the traditional types (Dairy, Sheep and Beef) increased, in response to the subsidies, until 1982, and that after 1986, this number returned to its 1980 level. (These three groups include farms, which derive at least 50 percent of their gross income from one of the three production lines.) At the same time, the share of traditional farm types declined from about 70 to 62 percent of all farms. The increase in total farm numbers mentioned above was therefore the result of an increase in the number of non-traditional farm types. Besides a shift to fruits and vegetables some farmers shifted to deer and goat farming as a response to the cut in subsidies in the traditional products.

Within the three traditional production lines (see Figure 4) one can see a shift from sheep farming to beef farming and, in some stages, to dairy farming after 1983. The number of sheep farms declined absolutely, whereas the number of beef farms and dairy farms increased. Desubsidization forced the greatest adjustment costs on farms earning their income from sheep. The data show shifts from the group *"sheep farming with a gross income of more than 75 percent of sheep"* to the groups *"sheep farming with beef or other"*. The more specialized operations changed to a more diversified production.

Initially, the main shifts probably occurred within the group of sheep farms with gross earnings mainly from sheep (reflected by an increase in the groups *"sheep with other"* and *"sheep with beef")*. But shifts to the groups *"beef with sheep"* and to a lesser extent, *"dairy with other"* can also be found. Both groups show absolute and relative increases in their numbers.

In sum, the farm data in New Zealand show that liberalization does not have to lead to an inevitable decline in farm numbers. It is more a question of the ability and willingness of the farmers to response to new economical conditions and to adjust to it. It is likely that farms highiy specialized on intervention products have to pay the highest

adjustment costs, as did the sheep farms in New Zealand. But on the other side there is a wide range of products which will become more profitable when the price relations have changed due to a liberalization. These new production lines might offset in some parts the decline in the traditional production lines.

2. Farm level changes

Figure 5 shows real net incomes and real net worth for "average" sheep and beef, and dairy farms. The greatest decline in profitability has been for sheep and beef farms which have generally had lower profit than dairy since deregulation and desubsidization. The average sheep and beef farm had real profits since 1984 of only $30,000 per year, which was only one-half their previous levels. The prior downward trend suggests that not all of this weakness is due to desubsidization. Increasing government support did not manage to maintain real farm profits but did lead to an increase in real net worth in the early 1980s.

The most obvious survival response of farms has been the shift away from sheep, and the reduction in physical input use to reserve more of gross income for paying interest. The aggregate sheep to beef ratio has fallen from 15:1 in 1985 to 12:1 in 1990. Output price supports were biased towards sheepmeat which muffled the relative beef/sheep price and left producers in a poor position to exploit stronger world beef prices. Ramrathanan and Reynolds (1990) use the MAF pastoral model to show how high beef numbers would have been in the absence of price interventions and then conclude that "promotion of the wrong product" was an additional cost of subsidies.

The movement to beef farming has been especially pronounced in the North Island where the contribution of sheep to average sheep and beef farm revenue has fallen from 72 percent in 1980/81 to 52 percent in 1991/92 (NZMWBES, 1992). Farmers have been able to quickly build up beef production without waiting for the long lags of the cattle cycle because of the growth in dairy beef production. Thus, total beef production is up 22 percent since 1980/81, whilst total beef breeding cattle numbers are only 2 percent higher.

Figure 6 shows the input substitutions which have taken place on pastoral farms. The most dramatic change was the jump in interest costs, from 18 percent of sheep and beef farm expenditure in 1984/85 to 24 percent in 1985/86. There was a less severe increase for dairy farms. Farms survived by cutting expenditure on fertilizer and repairs and maintenance. Wage expenditure had already been decreasing and did not fall much further.

On sheep and beef farms, the share of expenditure used for fertilizer fell from 12.5 percent to 7 percent. This was mainly achieved by reducing the proportion of the farm which was topdressed - thereby saving additional application costs - from just under 50 percent down to 25 percent. Even in the better years of 1989-90, the average farm was topdressing only one-third of its area each year. This movement towards a longer fertilizer rotation may have been helped by the availability of slower acting phosphates (partially reactive phosphate rock). The stress on fertilizer was due to the reduction in input subsidies and the relation is weak. Debate still persists about whether permanent damage is being done to productive capacity by reduced fertilizer applications. The reduction in repairs and maintenance is a similar form of 'running down' capital.

It should be noted that agriculture's share of real GDP increased after 1984. The reason for this was the lower input use and 'running down' of capital (soil fertility, equipment upkeep) meant that value-added has gone up. These reductions in physical inputs mean that real working expenditure for the average sheep and beef farm fell from $89,000 in 1984/85 to $66,000 and then $60,000 in the next two years. (Data relate to expenses before standing charges such as insurance, rates, interest, managerial salaries and depreciation.) By 1989/90 they had recovered to $68,000, a revival of just over one-quarter the size of the peak-to-trough fall. The revival is more noticeable (0.36 compared with 0.27) on a per stock unit basis - which is a a better measure of input intensity - because of the fall in the average farm stock numbers.

B. Asset Values

The major adjustment in asset values occurred through land prices. Table 8 provides details for different farm types. Land suitable for dairying suffered the smallest price fall and also tended to have smoother peaks and troughs. The greatest adjustment was in the value of mixed cropping land, with almost two-thirds of the real value being lost between 1983 and 1988. This farming type suffered the double blow of low sheepmeat prices and loss of marketing board protection for wheat growers, many of whom were driven out of business by cheaper Australian imports. All land prices staged some recovery by June 1990, with land suitable for dairying gaining the most. However even this was a recovery of little more than one-third of the loss in real values during the mid-1980s.

Reduced land values appear to have forced an increase in non-family land transactions (Table 9). This decline in intra-family transfers is probably beneficial to the efficiency of agriculture, as resources go to the users who place the highest value on them. This increase in a "business-like" attitude resulted from the inability of farmers to retire to an urban property and keep sufficient money in the farm to give their child (son) easier entry. Reduced rural land prices forced retiring farmers to take their entire financial stake in the farm as purchase price for a retirement property.

The market for rural land also suffered a large quantity adjustment. Financial stress and pessimism amongst farmers saw the number of farm sales in 1986 decline to 1900, compared with a 1970-81 annual average of 4500. Even at the more realistic land prices of 1986-88, sales activity was very low and the source of demand was not from existing farmers. The average share of sales to existing farmers was 52% in 1982-84, but this fell to 43% in the six months to December 1986. However, as farmers recovered from their adjustment and real incomes slowly began to increase existing farmers re-entered the land market as buyers. Farm sales exceeded 4000 in both 1989 and 1990, and

existing farmers accounted for 60% of buyers, indicating an increase in confidence as producers attempted to upgrade their land holdings.

These changes in land values combined with changes in livestock and plant values, and movements in financial leverage, produced the sharp fall in real net worth between 1981/82 (sheep and beef) or 1982/83 (dairy) and 1987/88 (Figure 5) There was a loss of two-thirds of real net worth on sheep and beef farms, but less than one-half on dairy farms.

E. Political Response

It would be expected that the magnitude of the financial crisis that faced agriculture in 1985/86 would have led to massive aid from government in response to farmer demands. In fact government response was fairly muted. The major concession was the Rural Bank Discount Scheme which operated in 1986 and 1987. Farm mortgages were adjusted by suspending/reducing interest payments, capitalizing interest into principal or postponing/writing off principal. The state (via the Bank) suffered most of the direct writedowns; other debtholders voluntarily reduced their demands to a level the mortgagor could afford to service.

Johnson (1989) has analyzed this scheme and compared it with debt relief programs in the 1930s. A total of 8099 farms (10.7 percent) applied to have their mortgage restructured (this required budgets showing farm viability). Fifty-eight percent (4706) of applicants were successful and each had an average of $49,879 debt written off. In aggregate, these farmers owed the Bank $700 million prior to discounting, of which one-third ($228 million) was written off.

Some limited and decoupled welfare policies were also set up in July, 1986 and November, 1988. The latter were linked to drought assistance for the east coast of the South Island and then extended to the North Island in May, 1989. This "Adverse Events Family Income Support" made grants of $22.6 million to 3500 families in 1989. Linked with this were exit grants to encourage non-viable farmers to leave farming with the

government guaranteeing departing farmers' assets to be at least $45000. These grants were made to approximately 300 farmers (Chadee and Johnson, 1990). The combined value of debt relief and decoupled welfare grants was much lower than previous expenditure on price supports and input subsidies.

Why was government less supportive of farmer demands? One reason was the greater fiscal restraint. In addition agriculture had low political capital with the Labor Government. The Minister of Agriculture (Colin Moyle) had wanted a 1986 farm package with $200 million in suspensory loans but the Finance Minister (Roger Douglas) prevailed and farmers were instead given tariff reductions on some key inputs (gumboots, etc.).

It is also apparent that the finance sector boom diverted policy attention from the traditional exportables sector. As an indication of the boom in home goods (and therefore urban areas), in the two years following December 1985, 2.5 percent of aggregate employment moved from tradeables into nontradeables. Particularly notable is the 17 percent growth in employment in finance and insurance. Another indicator is that over one-quarter of the economy's capital formation in 1989 was in the finance and insurance sectors, compared with only 8 percent in 1984.

The sequencing of structural adjustment and government deregulation (including the corporatization of forestry, mining and railways) put greatest employment pressure on rural areas. Therefore the aspect of liberalization towards which voters were most sensitive - unemployment - was dispersed. The share of unemployment in metropolitan areas fell to its lowest level in 1987 (40 percent) compared with 55 percent in 1984. The problems of the rural sector were able to be largely ignored.

IV. *General Lessons to be Learned*

One cynic, speaking of the New Zealand Experiment (paraphrasing Mark Antony's funeral oration of Caesar) commented, "I came to bury New Zealand, not to praise her." In our opinion this is far too harsh a judgment. Some broad lessons can be gained by

other countries from an experiment which raises the central question: When and how should a country liberalize its agricultural and trade policies so as to maximize the welfare of its citizens?

In the first place, when a country begins to think about liberalizing its economic policies it should be under no illusions as to the difficulties to be faced, internally and externally, and the obstacles to be overcome, before a new economic and political equilibrium is reached. Past glory, historical positions as to living standards and economic power, as well as traditional political linkages, are all insufficient to carry a nation through the convulsive period which often accompanies the decisions that need to be taken to reach a new economic-political equilibrium. In the New Zealand case, past association with the British Empire, the wealth and high living of Post-World War II, and its dependable efficiency in delivering pastoral products at competitive prices in world trade, were not sufficient to carry it through the transition to a new era. Nor should a country expect sympathy in its trials and tribulations; witness New Zealand's desperate, but futile, attempt to get action in the GATT Uruguay Round of Trade Negotiations.

A. The Importance of Planning for Liberalization

It was suggested in the Introduction that when a country contemplates liberalization a preparatory assessment of benefits and cost is essential, including a timing of the legislative or administrative program of actions deemed necessary for liberalizing. Assessing potential changes in an international context such as shifts in commercial patterns and alliances are vital. Other nations might gain useful knowledge from New Zealand about the political forces and the national will that are needed to follow through with deregulation.

The New Zealand Experiment clearly suggests that a pre-announced plan for trade liberalization is desirable (Rayner & Lattimore, 1991). Because the various episodes in New Zealand's long-term attempt at liberalization lacked stated intent and specificity, constant pressure on politicians from rent seekers was enormous. At times politicians

appeared almost schizophrenic about the question of protection. As a general rule, with no firmly designed policy for liberalization to fall back on, it is difficult for ministers to resist appeals for help. And, in a situation where they and their bureaucracies have no idea what the targets are (e.g., levels for tariff policy) plans for appropriate restructuring of industries in anticipation of liberalization becomes futile.

A corresponding lesson is that when an individual country proceeds with the liberalizing process it would facilitate that process and would ease the economic burden if multilateral liberalization were occurring simultaneously, and if commodity prices were rising. During the period of New Zealand's accelerated liberalization, in a broad sense multilateral trade continued its post-World War II growth and protection continued to decline in the industrial sector. This did not hold for the agricultural sector, however, and the years following 1984 saw a hardening of protectionist sentiment. This is corroborated by OECD estimates of total transfers associated with the agricultural policies of selected industrialized countries which increased from a total of around US$250 billion in the mid-1980s to around US$300 billion in 1990. (OECD, 1991). This indicates that New Zealand was "swimming upstream" in its attempt to compete with the treasuries of the US, EC and Japan by trying to sell its desubsidized agricultural products on world markets. Its treasury could not continue to cope in the mid-1980s.

Simultaneously, New Zealand agricultural producers were facing commodity prices which had slowed in their growth, or had declined; and farm input prices which had continued to rise. As a consequence, the terms of exchange indices for the principal farm products, while fluctuating considerably, has undergone a long range declining trend, noticeably after 1974, but accelerating after 1985 (See Table 10). Adding to the burden of poor export markets was the heavy debt burden of New Zealand farms which was made worse in the late 1980s with a real interest rate (5-8%) which was significantly above the rest of the developed world. It proved particularly difficult to promote and to subsidize

the agricultural sector in an era of declining terms of trade for the sector, and in face of high or increasing interest rates.

B. Macreconmic Coordination and Liberalization

It is obvious that a country such as New Zealand has little control over the forces which dictate commodity prices, including the price of such inputs as petroleum which itself affects the profitability of modern agriculture. Moreover, small countries have little influence over the price policies of their chief competitors. In internal policy, however, New Zealand politicians had an enormous power for making decisions and the timing of their decisions. With a unicameral parliament, elected triennially, it was in position to analyze, then decide decisively on strategic questions. A prime example of this is that of the Muldoon Government of the late 1970s and early 1980s, whose "Think Big" expansionist macroeconomic and support policies did not jibe with world economic conditions. The government's efforts to protect the domestic economy by borrowing heavily abroad after 1976 led the government to shelve efforts at full employment so that the balance of payments could recover (Figure 7). Despite government efforts to make the economy more responsive to international prices after 1984 the deficit was severe in the high growth years of 1984 and 1985 (Dalziel & Lattimore, p. 12). The lethargic nature of the GATT Uruguay Round of trade negotiations compounded New Zealand's dilemma for the next several years.

From the above we deduce another important lesson: a country should coordinate its macroeconomic policies with realistic conditions in the world economy and, above all, it should not proceed dramatically to liberalize its agricultural and trade sectors if the exchange rate is wrong; and particularly if its real exchange rate is appreciating. Even though New Zealand devalued its currency by 20% in early 1984, and followed by a float of its dollar in March 1985, high domestic inflation meant that the real exchange appreciated sharply (Figure 8). Even though the real exchange rate began to depreciate toward the end of the 1980s decade, in the meantime New Zealand's agricultural

producers lost international competitiveness. Coupled with the slowness of the GATT negotiations, this exacerbated that country's worsening balance-of-payments and overseas debt positions.

New Zealand was not alone in its troubles at this time. Countries such as Brazil, Mexico and others encountered many of the same problems which were brought on by some of the same policy mechanisms. Big projects were employed to sustain domestic employment, import substitution, consumer and producer subsidies, coupled with protection of the domestic import-competing industries. All these were interlarded with monetary and exchange rate policies which can ultimately generate much suffering to a country's agricultural sector. Even if a country proceeds with some or all these mechanisms as "tools," protection might still be consistently applied and administered. It wasn't in the case of New Zealand, inasmuch as agriculture was deregulated disproportionately after 1984. But before that time compensation was not consistently applied within agriculture with respect to both products and inputs. Diversification in New Zealand agriculture was not encouraged because of the generous support given to sheepmeats.

C. Sectoral Balance and Liberalization

Any attempt at economic reform by a national economy must keep in mind the historical development of the country, including the institutions associated therewith, and also the current realities of employment, income distribution, economic assets and political power. Thus, where a country adopts so thoroughly liberal market policies as New Zealand did in 1984 it should do so with some procedural determination, and not by chance. There had been many signals early on (Condliffe, 1969), as there usually are to national politicians, that all was not well in New Zealand. When finally forced to act as it did, its "lead card" was the deregulation of the agricultural sector, including the elimination of subsidies and other supports which were supposed to be followed with

equally dramatic reforms in other sectors of the economy. These latter proposed reforms were slow in coming and the agricultural sector, as has been shown, paid dearly.

In contrast to the typical pattern of economic development in OECD countries, agriculture continues to play a significant role in the New Zealand economy. This is the case even though as early as 1938 New Zealand initiated policies which had as their purpose the extraction of agricultural rents to finance industrial development. As pointed out earlier, this protectionist industrial policy constituted a tax on agriculture through the export and import sectors which was not completely alleviated by the 1984 actions. In fact, agriculture is still paying the cost of a policy which has domestic distribution overtones, rather than one which promotes resource efficiency as its major objective.

The New Zealand case is somewhat clouded by the fact that the largest supports to agriculture came in the five years just prior to deregulation. Given this subsidized inducement to produce, it is nevertheless strange that when the inducement was removed, and when the industry was in the doldrums as it was in the late 1980s, reforms in industrial policy, which were part of the original reform policy package, were never completed. New Zealand is still much further away from being a genuinely open and competitive economy than is popularly imagined, and the unbalanced and partial nature of the liberalization program is the source of many of the persisting economic difficulties.

Another lesson from this experience is that a country cannot systematically exploit its agriculture in order to support a welfare state which is inefficient and which is slow in reforming other sectors of its economy. Nor can agricultural policy reform be completely realized without general economic reform in a country. Such a policy ultimately leads to exhaustion of the natural resource base and severe environmental problems. When coupled with accelerated, compensating agricultural support programs, which were attempted by New Zealand in the 1970s, the result often is double jeopardy. There are many examples of countries other than New Zealand to illustrate this point. Exchange

rate manipulation, export taxes, export subsidies, credit policies and many other types of intervention tend to obscure need for market liberalization.

In sum, it is difficult to place an inordinate burden of reform on a country's agricultural sector, even when agriculture is responsible for a large part of its export earnings. Agricultural reform cannot be separated from the need for general reform of the entire economy. Costs of a protectional policy cannot continue to be masked in a world which is moving toward market liberalization.

D. Characteristics of Reform: Timing and Sequencing

The timing of reform measures, and their sequence, are of vital importance. The ultimate objectives of economic liberalization often are less subject to argument than the way in which reform measures are implemented. If some markets (e.g., agriculture) are fully liberalized while others continue to be subject to extensive regulations (e.g., labor markets) the process becomes distorted and the consequences for certain industries can be onerous.

There is no general agreement on optimal timing and sequencing strategy, but the central lesson for the sequencing of reforms implied by the experience of a number of developing countries is that the removal of specific policies within the agricultural sector is of itself not sufficient (Krueger, Schiff and Valdes, 1991). Even though theory does not provide an optimal sequencing strategy, some "rules of thumb" have been suggested by Janssen, Scobie and Gibson (p. 17): (1) Macroeconomic policies should support the liberalization program and stabilization efforts in terms of fiscal deficit reduction and disinflation should be undertaken early in the process; (2) The trade account should be liberalized prior to the capital account; (3) Goods, labor and capital markets should be liberalized before the links with the external sector; and (4) The liberalization process must establish itself as a credible and consistent package.

The same authors point out (p. 19) that in the case of New Zealand two aspects of the timing are important: First, at a policy instrument level there were early indications

that the disinflation process would require a floating exchange rate and the removal of capital controls. Secondly, the political economy issues may have necessitated the need to act quickly and in those areas where reforms were "easier" to implement and likely to create some early "winners". A graduated reform process is likely to come under pressure as protected economic agents have more time to coordinate lobbying activities. However, creating a class of winners may also divert policy attention from short-term damage occurring in sectors which are ultimately expected to contribute more to the economy after structural adjustment is complete. This seems an apt description of the finance sector boom and the resultant belief that New Zealand did not need to rely on merchandise exports, so policy settings inimical to agriculture could be ignored.

E. Should a Country Liberalize Independently?

Normative judgments about the desirability of New Zealand's unilateral reform depend on the attitude taken towards world market prices. In a world of pervasive interventions by the European Community, Japan and the United States, prices in world food markets do not reflect the social opportunity costs of production. These prices most definitely do not send the right signals to allocate production on the basis of international comparative advantage. By unilaterally liberalizing and using distorted world market prices as a resource allocating mechanism, New Zealand risked placing itself in a disadvantageous position if and when multilateral liberalization did occur. In a less distorted world it is possible that New Zealand farmers should not have reduced sheep numbers by 15 million, that they should not have drawn down soil fertility by reducing the annual topdressing, that they should not have let their plant and machinery depreciate without repairing and maintaining them.. If there was to be multilateral liberalization, New Zealand might have to increase investment again in those areas. On the other hand it is possible that New Zealand farmers will be "world champions" in a deregulated world agriculture because they have survived the rigors of their own unilateral liberalization.

If the Uruguay Round had started in 1983 and concluded successfully by 1985, the Muldoon Government's price support policies might have been justified as maintaining output and investment through the years when Northern Hemisphere farm policies were sending the wrong signals to New Zealand producers. Unfortunately the Uruguay Round did not have such a happy history. Each year that it dragged on, and each year farm programs survived, added to the conclusion that New Zealand was wasting resources by supporting producers, waiting ever patiently for others to change.

New Zealand finally decided that a small country could not afford to wait, paying its farmers to maintain output and investment in the hope of a saner world food market. The meager nature of a small country's treasury forced it to bite the bullet and liberalize, regardless of the actions of other countries.

V. *Implications for the European Community of New Zealand Reform*

It is not possible to draw a close parallel between the New Zealand experience of removing subsidies to agriculture and the problems facing the European Community in reforming its agricultural policy. The initial situation in New Zealand was very different to that of the Community, and the impact of reform on the farm sector would not necessarily have been comparable. Whereas New Zealand's agricultural policy was always export oriented and aimed at increasing the export earnings of the farm sector, the EC's agricultural policy was mainly oriented towards its internal market. Although some products like butter were in surplus and have been exported since the creation of EC, the instruments employed by the EC's agricultural policy-makers were meant to support farmers and farm incomes. Compared with New Zealand the farm sector in the EC has never had the same importance to the overall economy, although this varies between the member states.

When one compares reform options in the EC and NZ, it has to be kept in mind that NZ is a single non-federal country whereas the EC is a very heterogeneous community of 12 states, all of which have different interests in the farm sector. The southern member countries depend more on agriculture as a major employer and source of GNP. Some northern countries such as France and Denmark depend more than others on the effects of export earnings from agricultural products. Germany is economically less dependent on the farm sector but farmers represent a large body of voters with a very efficient lobby. This implies that not only must the acceptance for reform be built up, like in New Zealand, but that this must occur more or less simultaneously in all 12 member states. Either financing the CAP has to become a real burden for the taxpayer and consumer, or there must be pressure from outside as in the current GATT Round. Given a real pressure from the industrial sector, faced by the threat of import taxes in other countries, the necessary change in the political mood might occur.

Despite these differences some aspects of the New Zealand experience do have considerable relevance for the EC both in terms of its own reform process and the impact of sudden changes in profitability of farming systems. This section looks at these lessons under two headings: a comparison of the New Zealand and EC policy reform options; and the implications of similarities and differences in farm structure for the impact of EC reform.

A. Comparison of EC and New Zealand Reform Options

The EC devised its Common Agricultural Policy in the 1960s as a way providing a protective umbrella over the markets of the original six countries, to enable the development of internal trade and to stabilize and raise rural incomes. In these respects, the policy was a success. Increases in productivity boosted both incomes and output: coupled with the expansion of internal trade, these developments drove the EC toward self-sufficiency in a number of products.

At this time, New Zealand agricultural policy was largely oriented towards maintaining free access into the UK market for lamb, butter and cheese, under Commonwealth preferences. This orientation of New Zealand exports towards the British market was preserved under terms of UK accession to the EC in 1973, though efforts were also made to diversify into other areas such as the Middle East. Policy in the decade after UK accession to the EC attempted to cushion the effects of these export market developments on New Zealand farmers.

The problems of the EC were more of their own making. The requirement for unanimity in decisions on policy change meant that the instruments set up under the CAP, to shield the domestic market and to dispose of the occasional surplus, became used as open-ended support for the dumping of increased quantities of goods on world markets. Discipline through price moderation failed to stem the tide, and drastic price cuts were deemed politically unacceptable. Finally, piecemeal policy changes were introduced which began to have an impact on output and expectations. Dairy quotas were introduced in 1984 and the system tightened in 1986, removing at least some of the threat of further subsidized sales of butter and cheese in competition with New Zealand. Cereal prices were linked to overall production, at first rather loosely, to overall production through the guarantee threshold system (1981), then more effectively through the maximum guarantee quantities of the "stabilizer" system (1988), and then finally cut directly in the MacSharry reforms of 1992.

New Zealand policy reform in the mid-1980s was in part a realization that the expense of maintaining farm prices for products with declining (or fluctuating) export prospects was becoming too great for macro-economic stability. In addition to the desire, in common with other countries, to "get government off the backs of farmers," was the pressure by the economic policy departments to "get agriculture off the back of government." The parallel set of pressures in the EC was considerably diluted by the greater size of the home market and blunted by the structure of common finance and

decision making. It was much easier for the EC to maintain high prices for export commodities in the face of low world market prices: most of the funds came from the consumers as direct transfers through higher internal prices. The financial cost of export subsidies was not large relative to the size of national budgets, though export subsidies began to take up a large share of the Community's own budget. Moreover, the exporting countries (France, Denmark, Ireland and the Benelux countries) were heavily subsidized by the importing countries (the UK, Italy and Germany), as a result of the common financial arrangements. As a result it was not in the interests of the exporters to amend the policy to curb such spending. The prospect of policy change being imposed by the importers and major financial contributors was made remote by the obsession of the UK with limits on its own budget contribution (rather than with the spending of the EC as a whole) and of Germany with maintaining high prices for its Bavarian farmers. Despite periodic crises, the CAP never looked in serious danger of reform from the weight of export subsidies on the economies of the Community countries.

As a consequence of this, there was no serious debate in the EC about the possibility of removing all price support from agricultural markets. Whilst in New Zealand not only society but also farmers themselves were in favor of changing the policy of state intervention, in the EC. European farmers may never be in favor of a radical change in the CAP. This was not because the EC has cultivated less "business oriented" farmers for the last 30 years, but because it appeared obvious that the majority of the farmers would suffer as a result of liberalization. In New Zealand the farmers could be optimistic that they would be better off after a certain transition to the new situation, especially since the import competing sector was meant to be liberalized as well. As the EC industrial sector is less protected such offsetting gains cannot be expected for farmers in the EC. In the EC, taxpayers and consumers were not fully aware of how much they paid for the CAP and furthermore although the EC spends a large amount of money on agriculture the financial burden was relatively small. Whether the reform in the agricultural policy in the

EC announced with year indicates that there has been a fundamental change or only a small adjustment cannot be predicted at the moment.

In the United States, the Reagan Administration sent to Congress a draft for the 1985 Farm Bill that would have phased out most farm programs over a period of years. This theme was repeated in the July 1987 position paper presented by the US to the GATT Uruguay Round of trade negotiations. The EC proceeded to brand the US proposal as politically unrealistic, and declined to accept a removal of price supports as even a distant long-run objective. If the New Zealand Experiment were noticed at all in Brussels and the EC capitals it would have been dismissed as an oddity of no particular relevance to the EC. By the time the EC began to discuss long-term targets for reduction of protection, in the context of the Uruguay Round, the level of protection had risen with the slump in world prices. The task of removing such protection would have been formidable even if the right combination of administrative enthusiasm and political acquiescence had existed.

When the EC finally came around to the view that the major policy instruments in the CAP had to be changed, the issue was posed in a different way to that in New Zealand. The debate in the EC took for granted that farmers would have to be compensated for the fall in prices under reform. Whether because of the longer time in which price supports had been in place or because of differences in the political attitude towards farm income maintenance, it was never on the cards that the EC could lower prices without compensating farmers for the lower transfers through the market. No non-agricultural offset was available, such as the reduction in industrial tariffs which eased the decision in New Zealand. No overarching economic reform program could be used as a justification for the desubsidization of agriculture. The major policy change, when it came in May 1992, involved the significant lowering of market prices for cereals, oilseed and protein crops but offered a package of compensation payments which would have delighted New Zealand farmers. Not only were these compensation payments designed to

offset essentially all the impact on income of the price fall, but they were neither limited to a transition period nor restricted to the present generation of farmers. The entitlement to the income streams seems to have survived the process of reform in the EC.

It is clear that the CAP reform of 1992 cannot be seen as a real reform of agricultural policy as occurred in New Zealand. Compensation payments are still taken for granted. It is unclear how long the payments will be given to farmers. These payments, fixed to the land in use, is not production neutral. On the other hand the reform might be seen as a first step in the right direction. Prices will drop to near world market price levels. The compensation is only compulsory for the next three years. Theoretically and legally the EC would not have to prolong it after three years. If the reform is meant as an introduction to a more liberalized farm sector, the farmers will have the change to adapt their production to world market conditions over a certain length of time.

A final distinction between the options facing the EC and New Zealand has to do with the relations between unilateral and multilateral liberalization. In the case of New Zealand, as indicated earlier, unilateral policy reform was precipitated by external events but could not wait for multilateral action. New Zealand thus ran the risk of over-adjusting to a set of depressed world prices which might have been raised by a liberalizing trade agreement. The EC could have facilitated that trade agreement, should it have wished to do so, by negotiating in the Uruguay Round a rapid elimination of trade-distorting domestic policies. Had such a decision been taken in 1988, when world prices were generally high, adjustment costs could have been reasonable and compensation financially viable. But the EC had just completed its painful internal "budget stabilizer" reform and could not bring itself to undertake such additional obligations. In the event, New Zealand was probably justified in taking unilateral action rather than waiting for the promised reform of world trade.

The EC (and the US) have both political and economic reasons to link domestic with trade reform. On political grounds, domestic reform is more likely to be acceptable if

it can be shown that other countries are undergoing similar reforms. And at a time of trade negotiations, domestic reform in advance of trade reform is seen as giving away bargaining chips. In economic terms, the EC and the US are likely to have a greater (upward) effect on world prices through their own reforms and thus reduce the gap between domestic and world prices. Even for the EC the benefits of unilateral liberalization need not be postponed until other countries choose to change their policies. The largest costs to existing protection fall internally, in the protecting region. But the case for coordinating domestic and trade reform policies is stronger for the large traders such as the EC and the US than for smaller countries less influential in world markets and diplomatic circles.

B. Farm Structure and Reform

The main aim of removing price supports and input subsidies in New Zealand agriculture was to reduce government costs: the main effect was to reduce asset values in farmland and to induce shifts in the pattern of farming. The impact of a rapid decline in prices in the EC would also no doubt cause asset values to fall. In both countries subsidies were capitalized into land prices. A decline or abolition of subsidies leads to lower land prices and a loss of asset values. In New Zealand this loss occurred after the beginning of the liberalization and in the EC it started in the mid-1980s, when a restrictive price policy was implemented. If the reform process continued in the EC, the land prices will fall further. The numbers of farmers stayed more or less the same in New Zealand, which definitely cannot be expected for the EC. Too many farmers have been kept in the sector by the effects of the subsidy policy. The farming structure for traditional products in the EC as a whole is still inadequate to be competitive on world markets.

It is clear that New Zealand experience does not seem to indicate a rush to give up land and move to the towns. The fall in land prices seems to have occurred as soon as expectations are formed on future profits per hectare. For many it would have been too late to sell up after the policy decision has been announced: farmers had little choice but to

accept a loss in the book value of their assets. New entrants, or those seeking to expand, presumably found it easier to purchase land at the lower prices. Some increase in farm size might be expected from such changes, but if scale economies are the main determinant of farm size then it is not clear that these would be affected by the price fall.

Whether or not EC farmers can absorb this loss in asset values more than NZ farmers is not clear. Obviously the EC is able to pay compensation, whereas the NZ government was not. If the loss of assets occurred only on paper it would be painful but possible. However high land prices in general lead to high debts per hectare. The fall in land prices could bring some farms to an unacceptable debt/equity ratio. It can be assumed that the same will happen in the EC, but there is no reason why farmers in the EC will in principle be less able to cope than farmers in New Zealand, who paid back some of their debts after the liberalization. This is especially true because farmers in the EC are more likely to get some sort of compensation.

It is less clear what would happen to farming patterns in the Community. Two prevailing views can be identified, at least from casual observation. One view holds that large areas of farmland would be abandoned, as a result of lower prices and profits. Depopulation of the rural areas would cause severe problems both for the urban areas to which people moved and for the remaining business activities and social services in the rural areas. The other view holds that farming would continue to use much the same land area with much lower price levels, but that the intensity of farming would be considerably reduced. Input use and stocking rates would decline, to the advantage of environmental objectives though at the expense of supplying industries.

What would happen to the production structure in the EC and would we expect huge areas of idled land and unpopulated areas? There is no uniform answer to these question for the EC. Based on New Zealand's experience it can be concluded that liberalization doesn't have to lead to massive rural depopulation. This depends on the available opportunities to work outside the farm sector and on the structural adjustment

that has to take place to adapt to the new conditions. New Zealand's structure with respect to farm size was not in need of a great change. In the EC it can expected that a massive potential for structural change exists. Therefore it is obvious that some farmers and their families will have to leave the sector and might have to leave this region. But if land prices adapt to the new conditions it will be still possible for some farmers to produce. (As long as, for example in southern Germany, farmers are paying up to 1500 DM/ha for land rental, there is still a huge potential for an adjustment left.) So far it has been very difficult for newcomers to enter the sector. (In New Zealand, for example, a private company - Applefields - started in 1988 with 12,000 cows and the necessary land and 400-ha apple orchard.) That will change due to lower land prices. Therefore it is not very likely that huge areas will be idled, at least not in the northern countries of the EC. In southern countries such as Spain or Portugal, rural depopulation has been underway since before the reform and will likely carry on.

In New Zealand one observes a shift from sheep production to other traditional and non-traditional production lines and to less intensive production. This was a reaction to altered price relations. In the EC the same change is likely to happen. In the past, EC farmers have reacted to changes in price relations. (The restrictive price policy for grain led to a shift towards more rape, as that crop became relatively more profitable since the mid-1980s.) It is often said that the adjustment to new price relations was probably especially fast and easy in New Zealand, as a shift from one pastoral production line to another is rather easy. That might be true, but does not prove that there can be no adjustment to different crops or towards more pastoral land usage in Europe.

One notable aspect of New Zealand agriculture is the youthful nature of its workforce. Attwood (1984) contrasted the age distribution of New Zealand and European farmers and farm workers. Using 1981 Census records, he found that the 20-29 age group dominated in New Zealand. Those over 60 years old comprised no more than one-third of the number of the 20-29 age group. Attwood found that the situation in

many European countries was just the reverse. The benefit of an age structure which is skewed towards the lower working age groups lies in the ability of younger people to adopt to new opportunities created by both technical and policy changes. Moreover, younger workers are able to accept more demanding conditions and are less likely to be trapped in a business earning sub-optimal rewards because their opportunity costs are higher. Conversely, an age structure skewed towards the elderly, allows the possibility of easing adjustment costs following agricultural reform by moving ex-farmers onto state pension plans. In the present context, it is interesting to look for evidence of changes in the age structure of New Zealand agriculture since the subsidies have been removed and to update and extend Attwood's comparative analysis.

The age structure had been changing prior to desubsidization and deregulation. Attwood states that the number of farmers under 45 years old had increased from 52 percent in 1961 to over 60 percent in 1981. One might expect that agricultural reform would impact on age structure in two ways: (i) the forced removal of highly indebted farmers would be felt most by the younger age groups, and (ii) lower asset values would reduce the capital requirements of new entrants, thereby favoring the younger age groups. These two offsetting factors may be disguised by the time span of Census cross-sections (5 years), especially because the 1991 Census results are not available until October 1992.

Between 1976 and 1986 the major change in agricultural age structure was the increased predominance of the 30-45 age group (see Figure 9). While the modal group did move to the right (from 25-29 to 35-35) this was not evidence of an overall aging of farmers. All of the age groups above 45 years declined in importance from 1976 to 1986. The youngest age group also declined, most probably reflecting greater involvement in tertiary education by the 1986 population of farmers.

Controlling for changes in the age structure of the total labor force does not produce any obvious trends. The two age groups above 60 years did increase in importance, most probably because of the 1976 introduction of National Superannuation,

allowing more of the employed work force to retire at 60 years. The predominance of self-employed in farming (and the absence of tax clawbacks of superannuation for people who carried on earning) meant that National Superannuation had less impact on retirement decisions.

Several age groups show a decline in importance in 1981 and then an increase in 1986. It may be that 5 years is too short for observing trends. However, removing 1981 data would give the appearance of trends which were imaginary. The timing of the 1986 Census (March) places it perhaps one-third of the way through agricultural reform. Most reforms had been announced and implemented, and the year-to-June 1986 was generally the worst on record for both the meat and wool and dairy industries.

The comparison between the age structures in Europe and New Zealand is shown in Table 11.. Two aspect of this comparison are notable. The under-45 group is less than one-half the total in Europe and closer to three-quarters in New Zealand. The two dominant age groups in NZ are 25-34 and 35-44; in Europe they are the 45-54 and 55-64 groups.

To allow for differences in population structure, the age distribution of agriculture should be compared with that of manufacturing. Both Europe and New Zealand "lack" labor in the below-35 age group, when compared with manufacturing, with a consequent skew toward the older groups. However, European farming also "lacks" people in the 35-44 age group whereas New Zealand does not (see Figure 10). The most significant deviation from the industrial labor force is the high proportion of farmers and farm workers older than 55 years in Europe. (The deviation between farm and industrial age structures in Europe is illustrated by the sum of the absolute differences in shares of 0.48. In New Zealand the farm age structure is much closer to the industrial age structure, with the sum of differences only 0.22.) Thus even allowing for different population structures, agriculture in Europe is populated by a much older labor force than in New Zealand. This could have a critical impact on the speed of adjustment tc policy changes.

The difference in the age structure has two main implications. The older structure in the EC provides a change to reform the CAP now or in the near future without trapping too many farmers. The EC could help them leave the sector via early retirement payments. On the other hand, without compensation payment farmers in the EC will not be able to react as flexible as the younger ones in New Zealand. The development of the age structure in the EC indicates that more and more young people are giving up the goal of becoming a farmer, which supports the idea that the time for reform might be right in the near future.

C. Conclusion

The Community has recently embarked on a set of policy reforms which lead the CAP in new directions. As discussed above, the market price for cereals, oilseeds and protein crops is to be reduced, along with the support price for beef and sheep. (Planned cuts in the milk price level, along with cuts in the quotas, have been shelved for the time being, and reform proposals for sugar are expected next year). The main brunt of the price cuts on farm incomes is to be compensated by payments on a hectarage basis (subject to set-asides on larger farms). This reform package is hardly as dramatic as the New Zealand Experiment, but it is nevertheless bold in the context of EC farm politics. Does the New Zealand experience help in understanding the problems facing the EC in adjusting to this new policy?

To pose the question in this way is to emphasize the differences between the two reforms. Whereas the New Zealand reform removed price supports and input subsidies, the basic market stabilization and intervention mechanisms remain in the CAP. Rather than removing policies, a fresh instrument has been introduced in the form of compensatory acreage payments. Not only does this imply less complete liberalization, but it is not clear that asset prices will be reduced. Compensation payments will be tied to land use and will therefore be transferable with the farm as it changes hands. But costs can be reduced by cutting back on variable inputs such as fertilizer and farm chemicals.

Profits could even increase as the compensation payments will tend to overcompensate for net income losses from the market. Any significant price rise on world markets could increase this element of overcompensation. Rather than expecting a shift out of agriculture, the EC reform may encourage people to stay in farming. And the age-distribution will be less of a handicap for adjustment if "quasi-decoupled" payments remain with the farm.

There is little doubt that policy changes of the scale of that introduced in New Zealand would have a much more severe impact on EC agriculture. The mild reform of 1992 in the EC, with compensation payments for price cuts, is unlikely to have dramatic effects on farm incomes and asset values--though it could reduce cereal output significantly. But the New Zealand experience should at least be comforting to European farming interests who are concerned that farming without price supports is impossible. The evidence shows that farmers can survive the withdrawal of production (and investment) linked support. Generally speaking they adjust in a manner consistent with economic theory; reducing input intensity and substituting away from products with falling market prices. The rapid adjustment of New Zealand livestock farming, and the recovery of output and asset values, indicates that there is "life after subsidies," even if the prospect of European agriculture being subject to such a precipitate policy change remains remote.

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Table 1. Agricultural Production: New Zealand, 1987–92
(NZ$ million)

Year Ended 31 March	1987	1988	1989	1990	1991[p]	1992[e]
Wool[1]	1,226	1,385	1,508	1,235	832	863
Sheep and Lambs[2]	646	690	610	865	935	789
Cattle[2]	974	951	1,203	1,240	1,447	1,348
Dairy Products	1,212	1,431	1,902	2,166	1,662	2,034
Pigs[2]	110	110	101	125	126	125
Poultry and Eggs	179	186	192	215	208	198
Crops and Seeds	307	260	262	338	327	309
Fruit and Nuts	531	578	549	623	694	806
Vegetables	324	297	373	412	418	417
Other Horticulture	114	122	145	166	160	163
Other Farming	194	211	243	259	253	304
Agricultural Services	465	498	556	620	601	667
Value of Livestock Change	− 66	45	− 67	131	108	214
Sale of Live Animal	607	601	585	721	661	595
Total Output	6,822	7,365	8,162	9,117	8,432	8,831
Less Intermediate Consumption	3,776	3,851	4,271	4,711	4,583	4,686
Agriculture's Contribution to Gross Domestic Product[3]	3,046	3,515	3,892	4,405	3,849	4,145
Gross Domestic Product	55,088	61,851	66.606	71,549	73,747	74,700
Agriculture as a Percentage of Gross Domestic Product	5.5	5.7	5.8	6.2	5.2	5.5

p = Preliminary
e = Estimate
1. Excludes slipe wool and sheepkins.
2. Sales for slaughter, including on-farm kill.
3. "Agriculture's Contribution to Gross Domestic Product" is gross agricultural output measured at the point of first sale including agricultural contracting, less off-farm non factor inputs. These items (for example, wire, which comes from the metal manufacturing sector) are called "intermediate consumption" items.

Source: Department of Statistics (1987 to 1991); Ministry of Agriculture and Fisheries (1992).

Table 2. Value of Exports: New Zealand, 1987–91
(NZ$ million FOB)

Year Ended 30 June	1987	1988	1989	1990	1991
Live Animals	153.0	188.2	212.1	193.7	178.9
Beef and Veal	1,024.5	985.0	1,279.7	1,091.6	1,283.8
Lamb	952.9	776.8	720.7	957.7	977.8
Mutton	141.5	123.7	130.4	135.8	171.8
Total Meat and Meat Products[1]	**2,262.7**	**2,217.2**	**2,424.9**	**2,355.1**	**2,612.1**
Butter	510.1	524.3	609.2	710.5	542.1
Cheese	276.7	286.2	319.8	341.0	358.0
Wholemilk Powder	334.5	313.7	487.1	443.8	668.4
Skimmilk and Buttermilk Powder	260.8	280.2	416.9	534.4	415.5
Casein and Caesinates	310.4	327.8	343.7	448.7	450.1
Total Dairy Products[1]	**1,762.8**	**1,776.4**	**2,234.1**	**2,534.2**	**2,485.0**
Meat Meal and Pet Food	50.6	57.0	73.0	69.0	68.8
Crude Animal Materials	133.3	148.0	191.1	201.5	217.1
Animal Oils and Fats	65.0	68.0	75.0	65.6	67.3
Greasy Wool	474.1	571.9	651.7	418.3	261.3
Slipe Wool	79.0	126.5	159.2	125.4	87.4
Scoured Wool	1,023.6	936.0	984.7	772.1	613.8
Tops and Yarns	100.3	93.5	113.4	98.2	78.7
Total Wool[1]	**1,677.0**	**1,727.9**	**1,909.0**	**1,424.1**	**1,043.7**
Hides and Skins	537.8	546.9	556.2	494.8	391.0
Total Pastoral Based Exports[1]	**6,642.2**	**6,341.4**	**7,675.4**	**7,318.0**	**7,061.4**
Fresh Kiwifruit	432.4	443.2	455.1	539.1	519.7
Apples and Pears, Nashi	127.6	161.5	161.5	218.3	305.2
Total Fruit and Vegetables[1]	**800.3**	**834.2**	**824.2**	**998.6**	**1,069.4**
Cereals and Cereal Products	65.8	47.9	27.3	15.1	13.9
Seeds, Other Vegetable Products	64.9	134.9	205.5	178.8	275.2
Eggs and Honey	7.1	6.6	4.8	4.3	6.5
Carpets	81.6	81.3	75.2	88.3	70.6
Leather	171.6	152.9	177.6	167.1	172.9
Dressed Skins	11.4	14.8	13.3	14.0	19.1
Total Agricultural Based Exports	**7,844.9**	**7,614.0**	**9,003.3**	**8,784.1**	**8,689.0**
Fish	733.9	623.0	819.0	734.9	791.3
Total New Zealand Exports of Goods	**11,723.5**	**12,104.1**	**14,484.3**	**14,588.9**	**15,147.4**

1. Includes items not listed.

Source: Department of Statistics (1987 to 1991).

Table 3. Agricultural Sector — Contribution to GDP in New Zealand

Year Ended March	1982		1987		1990[p]		1991[e]	
	$m	% of Total GDP	$m	% of Total GDP	$m	% of Total GDP	$m	% of Total GDP
Farming[1]	2,196	7.5	3,012	5.5	3,811	5.3	3,415	4.6
Processing	1,404	4.8	2,392	4.3	3,217	4.5	3,439	4.7
Input Supply	745	2.6	1,044	1.9	1,154	1.6	1,171	1.6
Wholesale/retail	411	1.4	689	1.3	1,128	1.6	1,171	1.6
Transport	202	0.7	243	0.4	221	0.3	236	0.3
Total Agriculture	**4,958**	**16.9**	**7,380**	**13.4**	**9,530**	**13.3**	**9,403**	**12.8**
Total NZ GDP	**29,272**		**55,088**		**71,549**		**73,747**	

1. The figures for farming in this table are slightly lower than those in Table 6, which include the contribution by 'Agricultural Contracting Services'. This item is classified here as part of the Input Supply sector.

p = Preliminary; e = Estimate.

Sources: New England Institute of Economic Research, Department of Statistics, Ministry of Agriculture and Fisheries.

Table 4. Agricultural Sector — Contribution to Employment in New Zealand[1]

Year Ended March	1982		1987		1990[p]		1991[e]	
	No.	% of Total in Work Force	No.	% of Total in Work Force	No.	% of Total in Work Force	No.	% of Total in Work Force
Farming[1]	118,867	9.2	109,582	8.2	125,443	9.4	119,889	9.1
Processing	91,938	7.1	79,884	6.0	67,039	5.0	73,290	5.6
Input Supply	31,125	2.4	27,093	2.0	27,286	2.0	26,263	2.0
Wholesale/retail	10,895	0.8	10,844	0.8	11,334	0.8	11,049	0.8
Transport	9,636	0.7	5,487	0.4	5,541	0.4	5,244	0.4
Total Agriculture	**262,462**	**20.3**	**232,890**	**17.4**	**236,644**	**17.7**	**235,735**	**17.9**
Total NZ GDP	**1,290,900**		**1,338,800**		**1,334,000**		**1,317,100**	

1. Full-time equivalents.

p = Preliminary; e = Estimate.

Sources: Department of Statistics; Ministry of Agriculture and Fisheries.

Table 5. Assistance to Pastoral Agriculture: New Zealand 1970–90

Year Ended March	1970	1975	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990[f]
						(Millions of NZ$)							
Assistance on Outputs													
Dairy Board Stab.	−16	102	116	−23	49	81	0	0	0	0	0	0	0
Meat Industry Stab. Account	0	0	−44	26	99	270	274	337	176	2	0	0	0
Supplementary Min. Prices (SMPs)[1]	0	28	17	1	245	438	346	215	65	0	0	0	0
Inspection, Grading & Hygiene	1	4	34	35	52	60	59	59	63	59	34	35	35
Town Milk Subsidy	3	6	13	10	13	14	15	19	19	23	8	0	0
Total Assistance on Output	−13	141	136	53	457	863	694	630	323	84	42	35	35
Assistance on Inputs													
Fertilizer Subsidies	5	30	62	52	48	44	41	35	12	6	0	0	0
LIS/LDEL	0	0	3	7	14	14	18	10	4	6	7	9	13
Ag. Pest Control	2	2	5	6	5	5	6	5	4	4	3	3	3
Other	3	1	9	7	7	8	8	7	3	3	4	2	2
Total Assistance on Inputs	9	33	79	72	74	71	73	57	23	19	14	14	18
Assistance to V.A. Factors													
Advisory Services	2	4	7	9	10	12	12	13	14	16	13	13	11
Labor	0	0	9	7	10	11	12	7	6	2	0	0	0
Research/extension (MAF & DSIR)	4	8	27	34	39	44	48	48	51	58	61	46	46
Animal Health & Quarantine	2	8	19	25	30	30	29	29	32	32	32	31	27
Interest Concessions	5	14	45	63	75	92	119	152	242	207	226	91	26
Taxation Concessions	13	25	78	76	79	67	104	96	168	22	17	13	10
Ag. Organizations	*	1	4	2	2	2	2	3	4	3	3	3	3
Rural Bank Debt Write-off	0	0	0	0	0	0	0	0	0	76	133	0	0
Climatic Relief Grants[2]	*	*	0	0	0	0	0	0	0	0	0	37	30
Total Assistance To V.A. Factors	27	59	189	216	245	258	326	348	517	416	487	235	153
Total Assistance	23	233	405	341	776	1192	1093	1035	863	519	543	284	206
Total Value of Output	722	960	2621	2766	3165	3540	3631	4577	3831	3967	4575	5407	6148
PSE	3	24	16	12	25	34	30	23	23	13	12	5	3
ERA[3]	−8	38	12	3	49	123	98	40	34	19	15	−1	−6

1 Includes government grant for meat and wool stabilization in 1975.

2 In most years, climatic relief was in the form of interest concessions, and is included in that category.

3 The cost excess to pastoral agriculture is assumes to be 20% from 1969/70 to 1985/86, and 10% from 1986/87 to 1989/90. The lower rate for the latter years is to reflect increasing liberalization of non-agricultural activities during this period. A negative ERA indicates the cost excess exceeds total assistance.

* Less than one million.

f Forecast.

Figures are rounded.

Source: Tyler, Laurence and Ralph Lattimore. 1990. "Assistance to Agriculture," Chapter 4 in Farming Without Subsidies New Zealand's Recent Experience, Ron Sandrey and Russell Reynolds, eds., MAF, GP Books.

Table 6. Assistance to Pastoral Agriculture by Commodity: New Zealand 1970–90

Year Ended March	1970	1975	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990[f]
						(Millions of NZ$)							
Sheepmeat													
Stabilization (MISA)	0	0	0	0	72	269	278	346	176	0	0	0	0
SMP	0	26	0	0	53	183	264	201	65	0	0	0	0
Other	*	1	21	22	31	35	34	34	37	35	20	21	21
Total Assistance to Output	*	27	21	22	156	486	576	582	278	35	20	21	21
Apportioned Factor	9	18	49	58	60	61	81	72	64	71	76	28	24
Total Assistance	10	45	70	80	216	548	657	654	342	106	96	49	45
Total Value of Output	188	187	477	560	600	655	733	816	454	645	699	616	875
PSE	5	24	15	15	36	84	90	80	75	16	14	8	5
ERA[1]	−4	38	9	8	179	**	**	**	**	31	21	6	−2
Wool													
SMP	0	2	0	0	148	197	82	14	0	0	0	0	0
Total Assistance to Output	0	2	0	0	148	197	82	14	0	0	0	0	35
Apportioned Factor	7	22	84	84	96	88	108	111	151	134	157	75	42
Total Assistance	7	24	84	84	244	285	190	125	151	134	157	75	42
Value of Output	139	223	823	811	951	947	983	1258	1069	1217	1439	1623	1494
PSE	5	11	10	10	26	30	19	10	14	11	11	5	3
ERA[1]	−5	5	−3	−2	54	86	25	−4	5	13	12	−3	−7
Beef													
Stabilization (MISA)	0	0	−44	26	27	1	−3	−9	0	2	0	0	0
SMP	0	0	0	1	43	58	0	0	0	0	0	0	0
Other	*	1	9	10	14	16	15	15	16	15	9	9	9
Total Assistance to Output	*	1	−35	37	84	75	12	6	16	17	9	9	9
Apportioned Factors	9	18	64	57	60	70	79	94	110	107	107	57	36
Total Assistance	9	19	29	94	144	145	91	100	126	124	116	66	45
Value of Output	177	187	630	546	595	757	723	1063	779	975	977	1238	1294
PSE	5	10	5	17	24	19	13	9	16	13	12	5	3
ERA[1]	−5	4	−15	17	46	25	1	−5	11	18	15	−1	−6
Dairy													
Stabilization	−16	102	116	−23	49	81	0	0	0	0	0	0	0
SMP	0	0	17	0	0	0	0	0	0	0	0	0	0
Town Milk Subsidy	3	6	13	10	13	14	15	19	19	23	8	0	0
Other	*	2	5	7	8	9	9	9	9	9	5	5	5
Total Assistance to Output	−13	111	151	−6	69	104	24	28	29	32	13	5	5
Apportioned Factor	11	35	71	89	103	110	131	127	216	124	160	89	69
Total Assistance	−2	146	222	83	172	214	155	155	244	156	173	94	74
Total Value of Output	217	363	691	850	1020	1181	1192	1440	1529	1130	1460	1930	2485
PSE	−1	40	32	10	17	18	13	11	16	14	12	5	3
ERA[1]	−14	120	120	−4	16	21	2	−2	11	22	15	−2	−7

1 Includes government grant for meat and wool stabilization in 1975.

2 In most years, climatic relief was in the form of interest concessions, and is included in that category.

3 The cost excess to pastoral agriculture is assumes to be 20% from 1969/70 to 1985/86. and 10% from 1986/87 to 1989/90. The lower rate for the latter years is to reflect increasing liberalization of non-agricultural activities during this period. A negative ERA indicates the cost excess exceeds total assistance.

* Less than one million. *f* Forecast.

Figures are rounded.

Source: Tyler, Laurence and Ralph Lattimore. 1990. "Assistance to Agriculture," Chapter 4 in Farming Without Subsidies New Zealand's Recent Experience, Ron Sandrey and Russell Reynolds, eds., MAF, GP Books.

Table 7. Major Categories of Deregulation and Desubsidization in the New Zealand Economy

Reform	Macro Stabilization	Structural Adjustment	Deregulation
Import License Tendering		X	X
Devaluation	X	X	
Interest Rate Controls	X		X
Finance Sector Liberalization	X		X
Abolition of Foreign Ex. Controls	X	X	
Abolition of Export Incentives	X	X	
Abolition of Ag. Deficiency Payments	X	X	
Abolition of Prod. Bds Accounts	X	X	
Abolition of Farm Interest Concessions			X
Monetary Disinflation	X		
Abolition of Production/Marketing Controls			X
Reserve Bank Autonomy	X		
"User Pays" (R&E, QC, irrigation, pest)			X
Tariff Reductions		X	
Privitization	X		X
Health, Education, Welfare Reform	X		X
Labor Contracts Act	X		X

Source:

Table 8. Behavior of Real Land Prices in New Zealand

Land Type	Peak	Trough	Percent Change from peak to trough	Recovery as at June '90 as a fraction of the fall from peak
Dairy	June 1984	Dec. 1987/88	−42%	0.38
Fattening	Dec. 1982	Dec. 1988	−55%	0.23
Grazing	Dec. 1982	Dec. 1988	−45%	0.30
Arable	June 1983	Dec. 1988	−63%	0.13

Notes: Fattening Land is suitable for fat lambs, beef and stock breeding, whereas grazing land is mainly used for drystock farming and sheep and cattle production.

Source: *Valuation New Zealand (Land Price Indices) and Department of Statistics (Consumer Price Index).*

Table 9. Nature of Farm Sales in New Zealand

	Arms Length Transactions	Sold to Family
1982-1984	71%	21%
1985-1986	77%	16%
1987-1990	81%	12%

Notes: Data are for total (including non-market) sales.

Source: *Valuation New Zealand.*

Table 10. Terms of Exchange Indices for the Pastoral Industries in New Zealand[1] (1976 = 100)

June Year	Wool	Lamb	Mutton	Beef	Dairy	Pastoral
1965	93	114	120	110	112	109
1966	89	103	75	112	116	103
1967	74	82	68	105	113	98
1968	68	96	88	129	91	91
1969	67	114	97	126	84	93
1970	60	102	83	150	84	105
1971	54	92	76	149	96	101
1972	63	79	62	136	126	105
1973	130	134	136	186	115	137
1974	111	121	111	130	113	122
1975	65	71	49	71	100	86
1976	100	100	100	100	100	100
1977	110	113	154	91	92	102
1978	88	92	110	83	88	88
1979	93	100	103	130	84	103
1980	92	89	95	113	83	96
1981	70	76	75	91	84	88
1982	79	88	65	95	85	94
1983	70	80	59	97	90	90
1984	70	84	68	106	87	98
1985	74	81	75	121	87	105
1986	60	40	24	80	79	77
1987	67	58	37	78	65	76
1988	69	41	47	65	70	71
1989[e]	73	46	39	65	87	79

1. Calculated by expressing commonly based indices of output prices over indices of input prices.

e = Estimate

Source: Robinson, B.R. and R.G. Reynolds. 1989. "Measures of and Trends in Agricultural Competitiveness in New Zealand." Paper presented to the Annual Conference of the Australian Agricultural Economics Society (New Zealand Branch), Bulls.

Table 11. Age Structure of Agriculture and Manufacturing in the European Community and New Zealand

	Europe (1990)		New Zealand (1986)	
Age Group	Agriculture	Manufacturing	Agriculture	Manufacturing
	(percent)	(percent)	(percent)	(percent)
< 25	11.7	18.5	18.3	27.3
25–34	15.5	25.9	24.0	25.8
35–44	17.8	24.7	24.7	22.3
45–54	24.3	21.5	17.8	15.9
55–64	24.2	8.8	11.4	8.2
> 65	6.2	0.5	3.8	0.6

Source: Author's calculation.

Figure 1. Farm Financial Stress, New Zealand Farms, 1977-89.

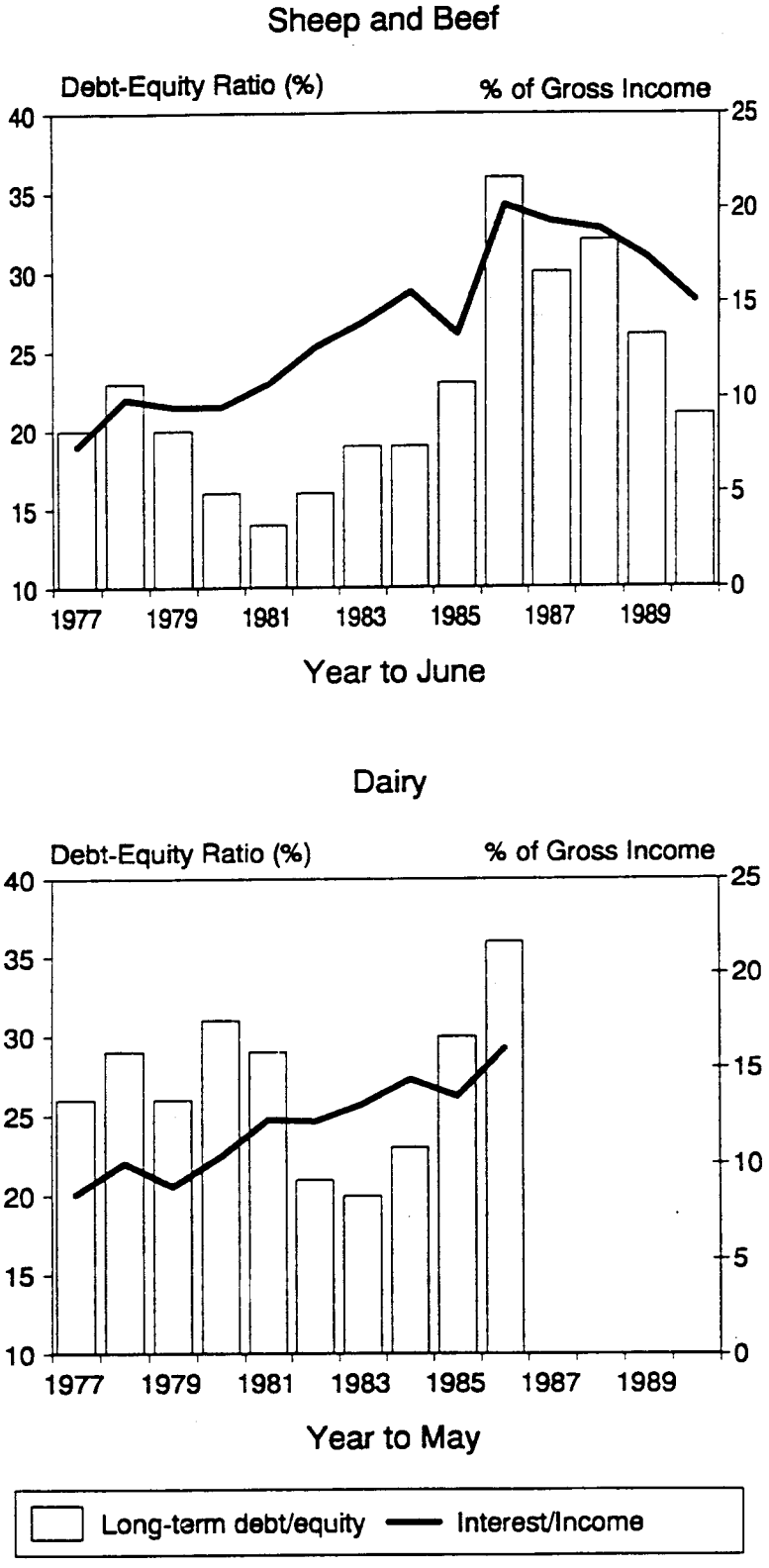
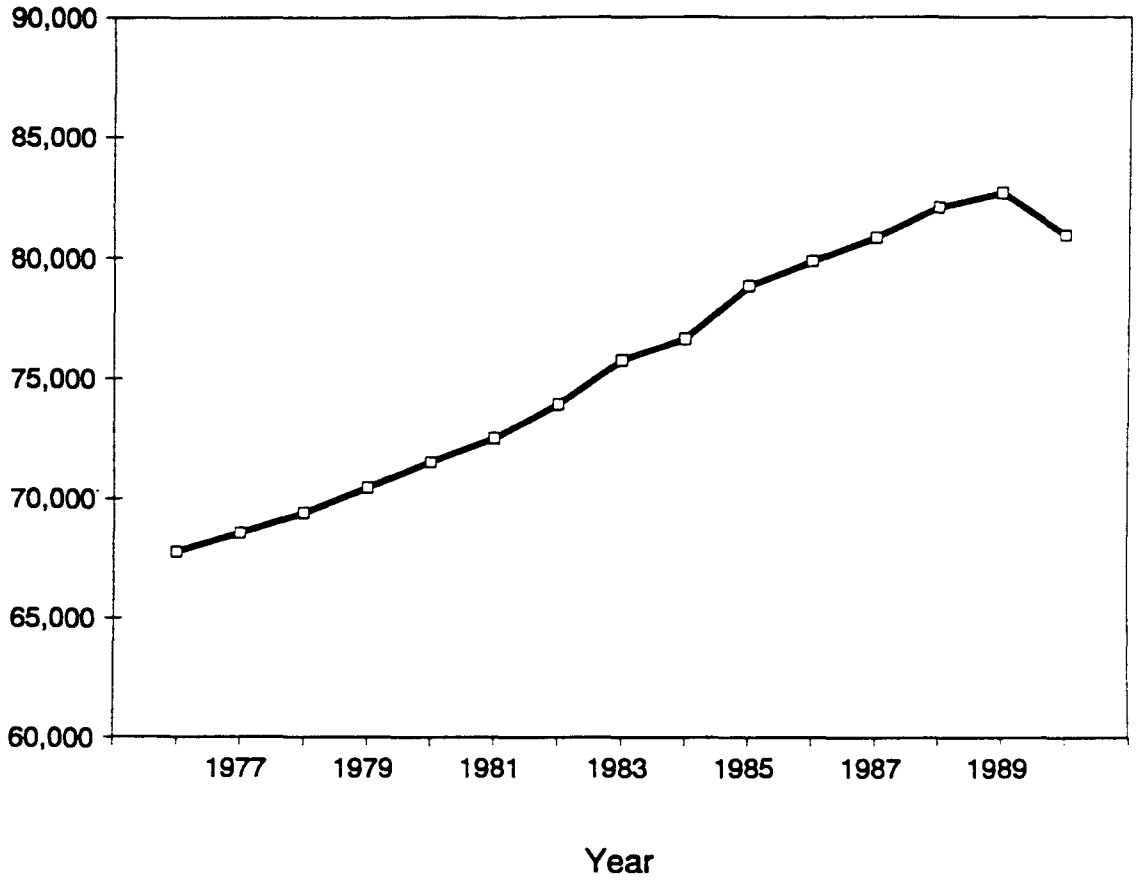
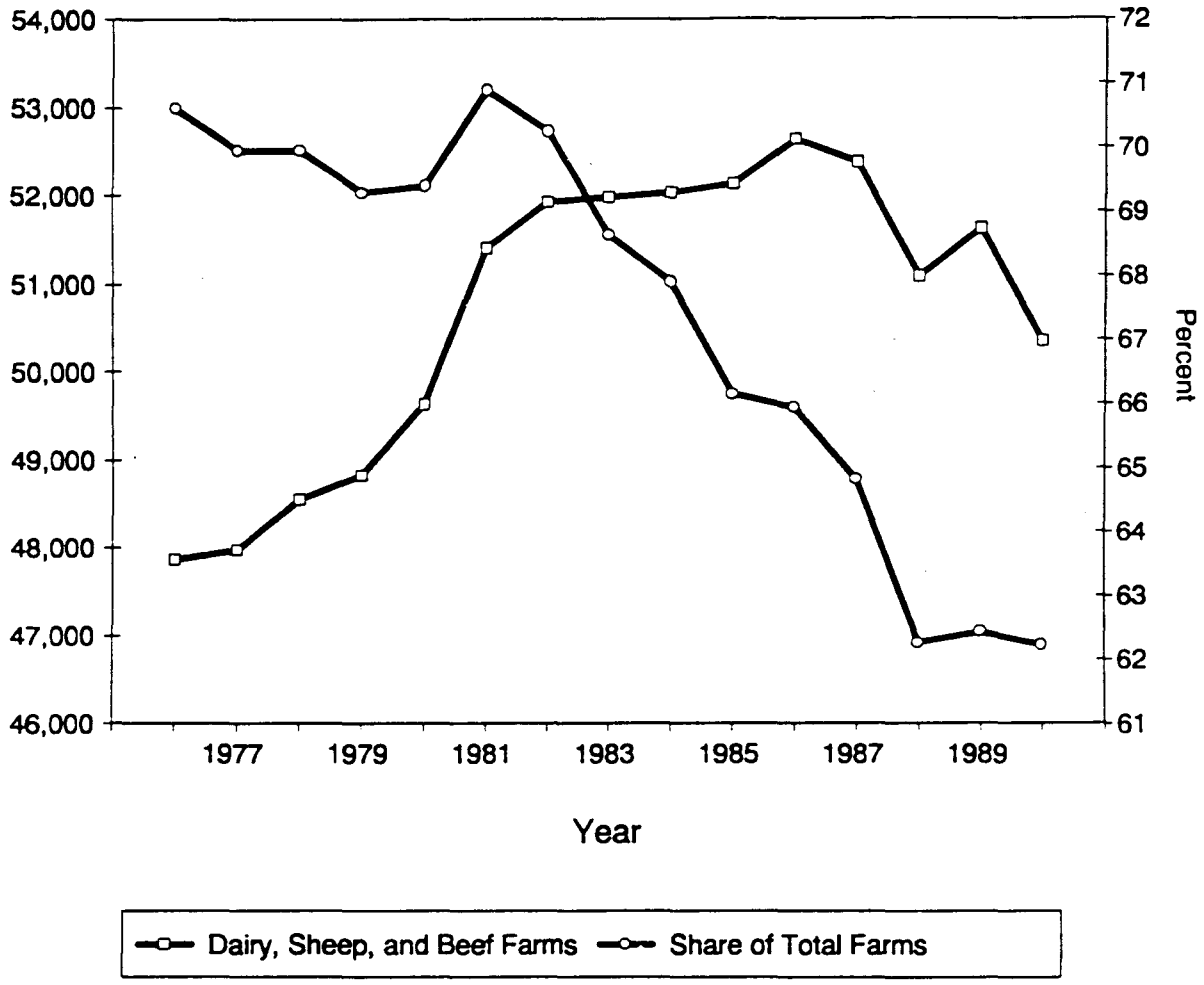


Figure 2. Farm Numbers in New Zealand, 1976-90.



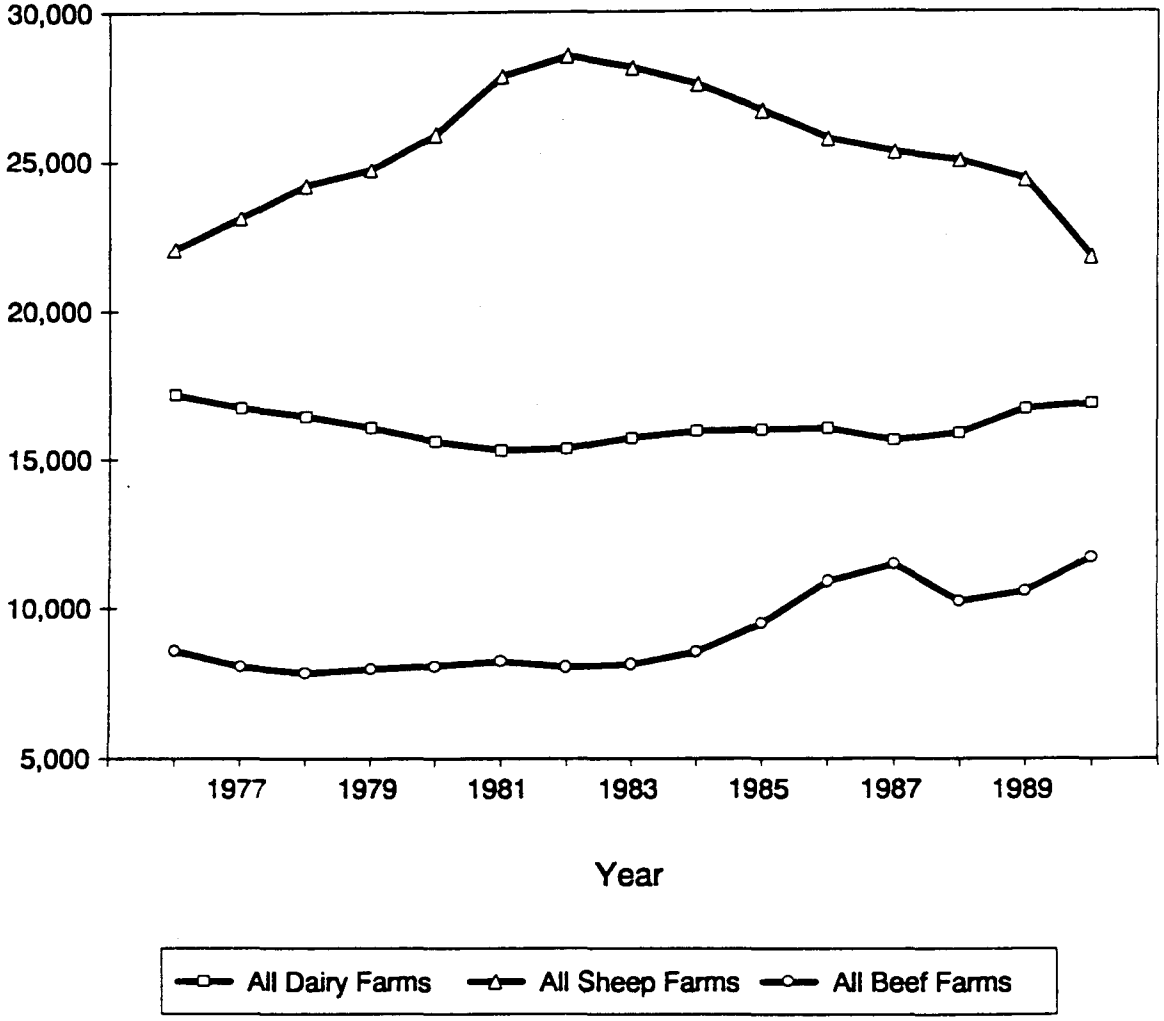
Source: Department of Statistics, Year Book, var. issues.

Figure 3. Dairy, Sheep, Beef Farm Numbers and their Partial Share of all Farm Numbers, New Zealand, 1976-90.



Source: Department of Statistics, Year Book, var. issues.

Figure 4. Variation in Farm Numbers by Types, New Zealand, 1976-90.



Source: Department of Statistics, Year Book, var. issues.

Figure 5. Farm Income and Net Worth: New Zealand, 1977-89.

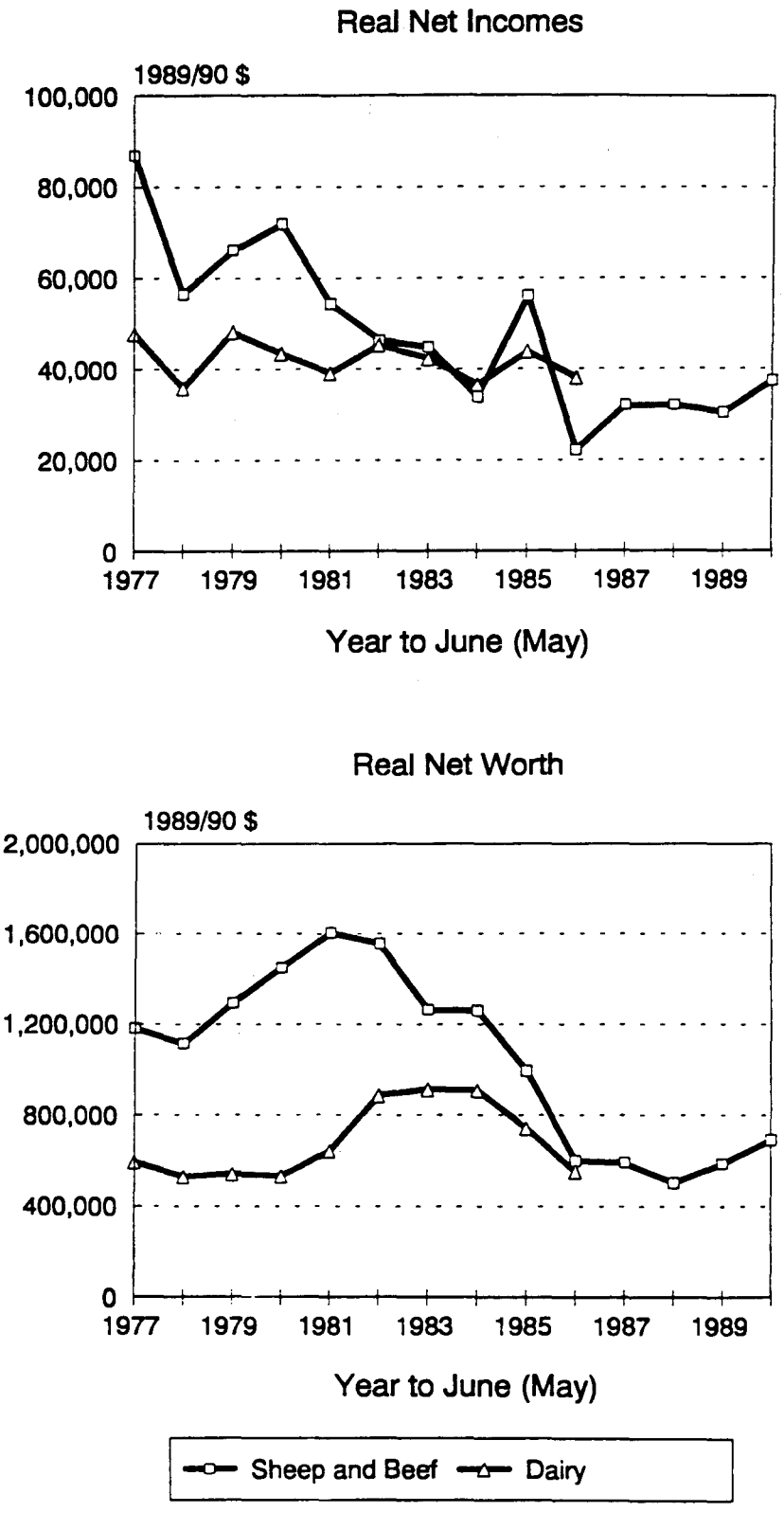


Figure 6. Farm Expenditure Allocation: New Zealand, 1972-89.

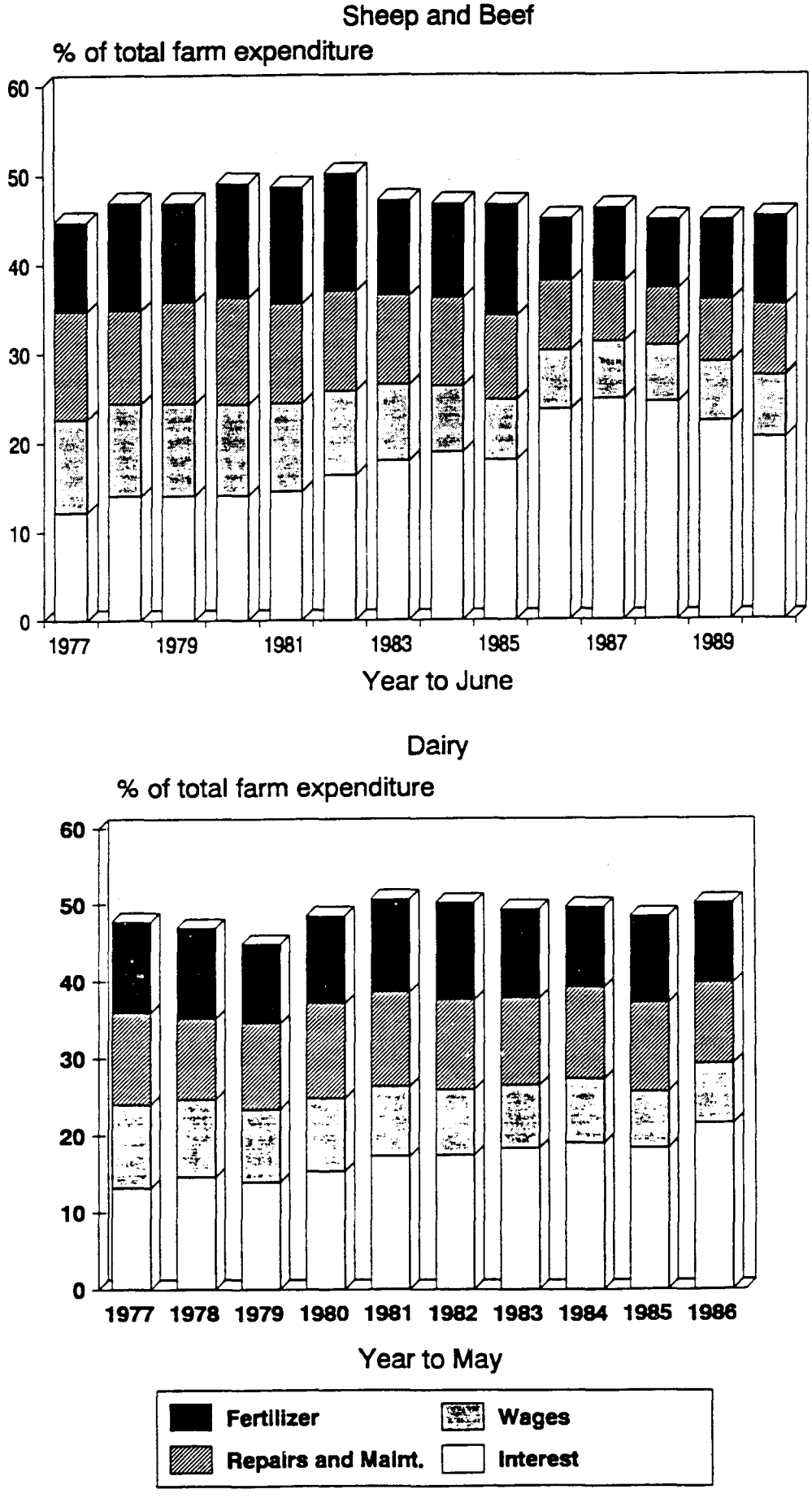
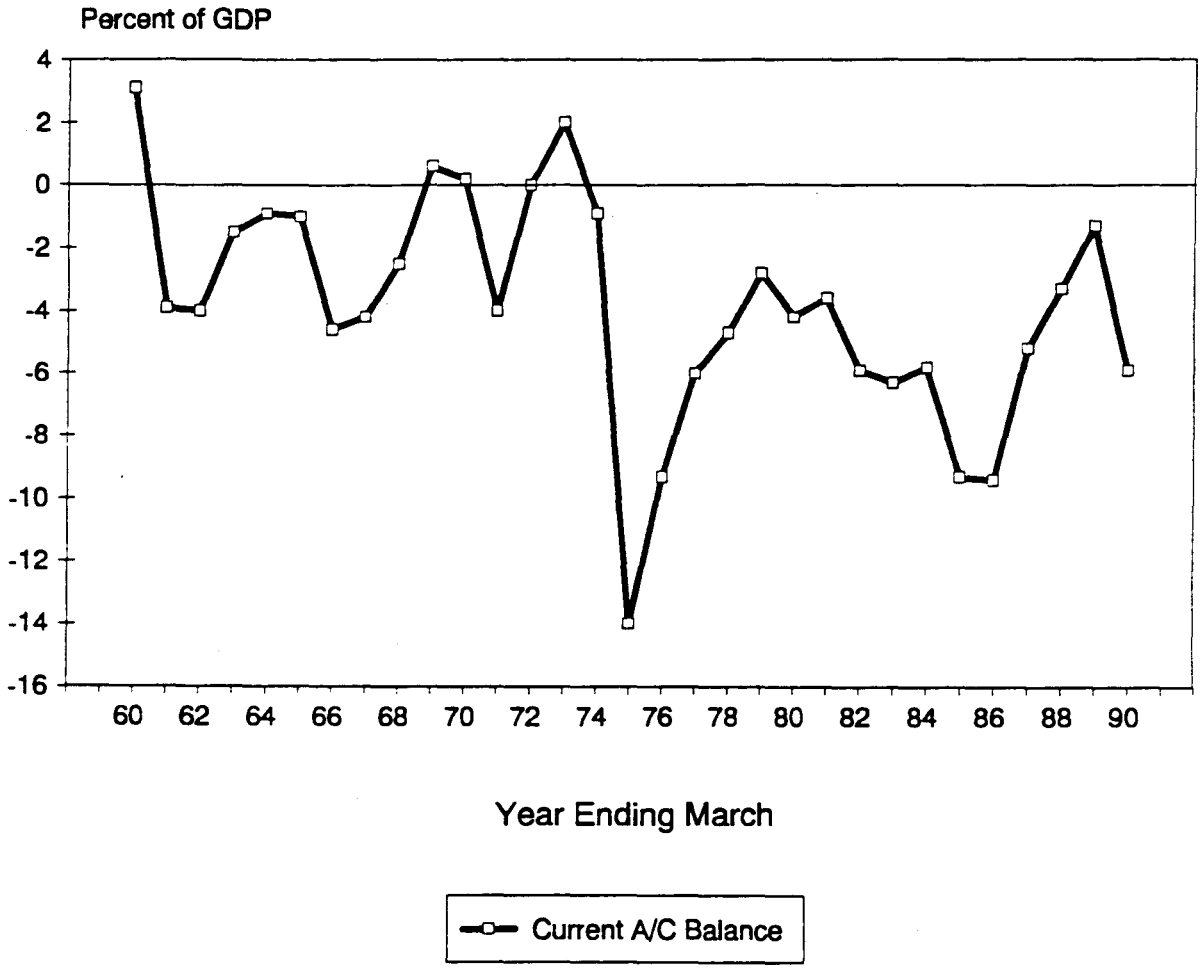
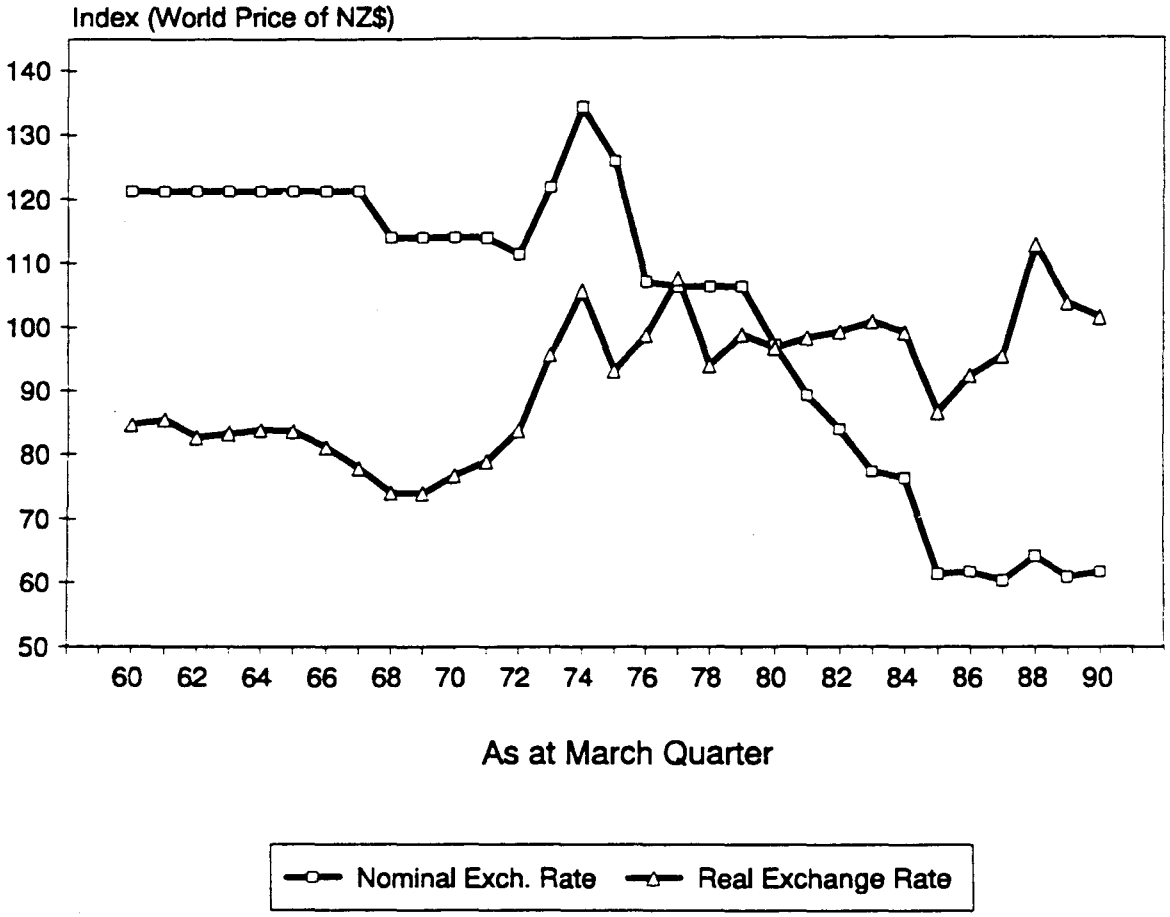


Figure 7. Balance of Payments; New Zealand, 1960-90.



Source: Dalziel and Lattimore; p. 13.

Figure 8. Nominal and Real Exchange Rates; New Zealand, 1960-90.



Source: Dalziel and Lattimore; p. 35.

Figure 9. Changes in the Age Distribution of New Zealand Agriculture

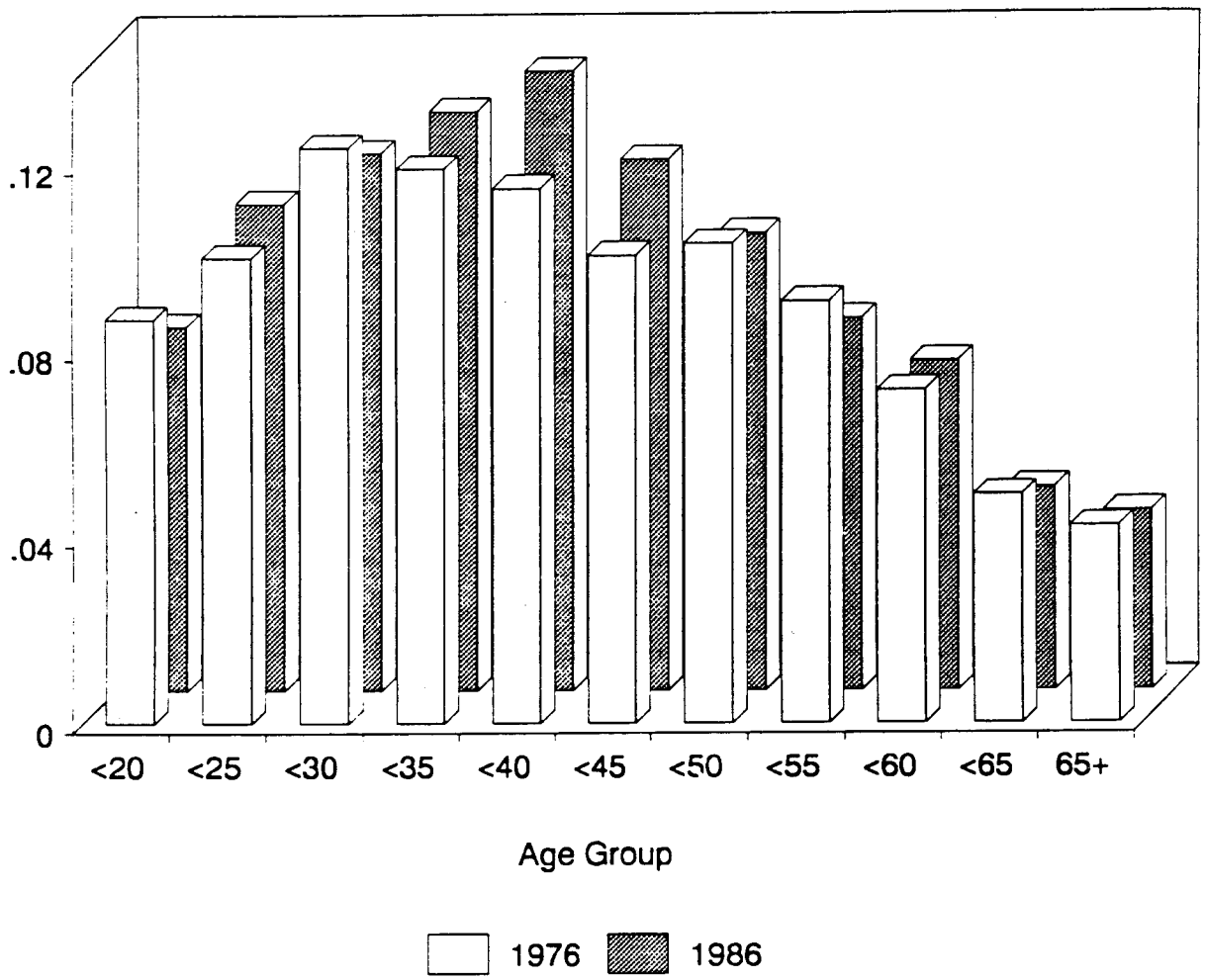
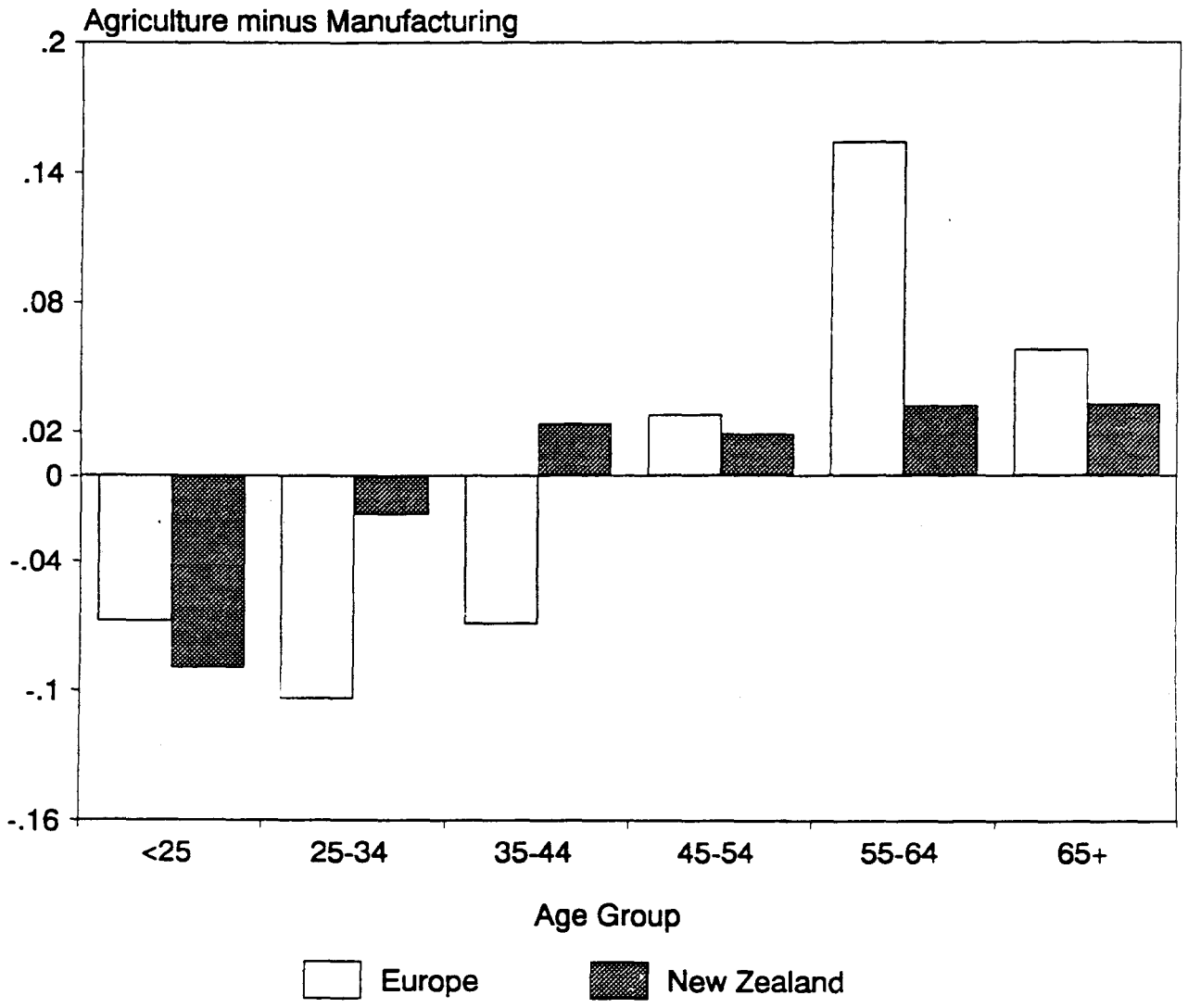


Figure 10. European and NZ Age Distributions in Agriculture Relative to Manufacturing



Note: If age group is over-represented in agriculture, compared with industry, the bar is above the x axis.

Sum of Absolute Differences
Europe: 0.48
New Zealand: 0.22

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