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FOREWARD

The theme for the 1986 Conference of the New Zealand Branch of the Australian Agricultural Economics Society was "Economic Liberalisation in Agriculture: An International Comparison." The Organising committee adopted this theme recognising the very significant changes in the economic environment which were being introduced. The removal of regulation, output and input subsidies, the floating of the exchange rate, the opening of the New Zealand economy to capital flows, the lowering of tariffs on manufactured goods - all these factors were leading to a new economic climate for the primary sector.

At the same time it was felt that we could benefit from the experiences of other countries which had implemented similar programmes. Conscious of the need for New Zealand to have as much professional contact with the rest of the world as possible it was decided to invite a number of distinguished overseas speakers. The society is grateful to the Reserve Bank of New Zealand, the Economics Division of the Ministry of Agriculture and Fisheries, the Treasury and to the Federal Council of the Australian Agricultural Economics Society for their support in this endeavour.

In addition, invitations were extended to a number of people to present papers which would complement the main theme of the conference, and I would personally like to express my thanks for their support.

In an effort to continue improving the professional image of the New Zealand Branch, we introduced a style guide for authors and have tried to establish consistent editorial presentation. However, these proceedings have been prepared with only limited editorial input; the papers were not subject to review and errors or omissions remain the responsibility of individual authors.

Finally I would like to thank the Director and staff of the Agricultural Economics Research Unit at Lincoln College for their collaboration in the publication of these Proceedings.

G. M. Scobie
President

ECONOMIC LIBERALISATION AND THE

IMPACT ON FARMING

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Key Words: Liberalisation, Farming

SUMMARY

Agriculture will perform well in a fully market-orientated economy. It along with other export industries will not perform in a "part market" economy.

The real concern is the transition stage with the agricultural sector being asked to cope with the "part market" economy of high inflation, a high New Zealand exchange rate, and the removal of most assistance at a faster rate than other sectors.

The expectation that the industry can adjust rapidly without enormous resource waste in the short term is questionable. A more moderate re-ordered approach to change could achieve the desired end result with less risk and resource waste.

The present farm restructuring is affecting local farming communities but will eventually affect the whole nation. Few in the community will escape the effects of this change.

1.

INTRODUCTION

Recent changes in macro-economic policy appear, at least in the short run, to be adversely affecting the agricultural sector.

To discuss the impact of these recent "liberalisation" policies on agriculture it is first essential to describe the place of agriculture in the New Zealand economy and then to place the policies in the context of recent agricultural events:-

- in the recent past
- in the current situation
- in the future with the current policies continuing.

2.

THE AGRICULTURAL SECTOR

In the national accounts the agricultural sector is defined to include net output up to the farm gate. However the agricultural sector in reality is wider than this concept and reaches much further into the economy to include input supply industries (e.g. fertiliser companies), processing industries (e.g. dairy factories and meat companies), and distribution and retail activities. On this wider basis the agricultural sector provides:-

- 17 per cent of net national output (G.D.P.) of which 9 per cent is behind the farm gate
- 19 per cent of total employment with half behind the farm gate
- 66 per cent of total merchandise trade receipts in 1984-85 at F.O.B.

Though we frequently hear that we are too dependent on agriculture in New Zealand by way of comparison agriculture in the United States accounts for 20 per cent of their gross national product! This provides an interesting perspective and raises the question: How much is too much agriculture in our economy?

As the total agricultural sector in New Zealand contributes nearly a fifth of net output and employs nearly one fifth of the work force any changes in policy which impact heavily on the agricultural sector will, necessarily, have significant impacts on a wide section of the New Zealand economy. This should be noted by policy makers.

3.

THE RECENT PAST

Development of the agricultural sector falls into three distinct periods:-

- 3.1 The 1950s with the Korean wool boom was a generally favourable income period. Technology inputs e.g. aerial topdressing, sharply lifted output, and this increased output was financed from farm generated income.

3.2 The early 1960s, the period of the National Development Conference, saw the introduction of policies which enabled farmers to deduct certain development expenditure items, and again output and on-farm productivity increased. However by the late 1960s the squeeze on farm incomes was intensifying and growth of output slowed.

3.3 In the mid 1970s following the first oil shock and through to the early 1980s Government again encouraged farmers to undertake further development and lift output. An inherent assumption was that this extra production could be sold.

In contrast with previous periods, this third development period involved significant borrowing. In addition to borrowing for development, farmers borrowed to supplement farm generated income, i.e. for maintenance and living expenses. While interest rates were low and land values were rising, and there was an expectation that land values would continue to rise, this seemed a sensible approach.

3.4 During the early 1980s S.M.P. payments were made to pastoral farmers by way of compensation for the overvalued exchange rate and high internal costs facing the farmer.

Many of the problems which the industry is grappling with today have been around for a long period. These are well known and documented but include for the last decade:-

- high inflation in farm input costs, up 263 per cent over the decade;
- prices received at the farm gate not matching domestic rates of inflation and increasing only 103 per cent.

Note: an increasing share of F.O.B. receipts has been absorbed beyond the farm gate activities through increased charges in the processing area;

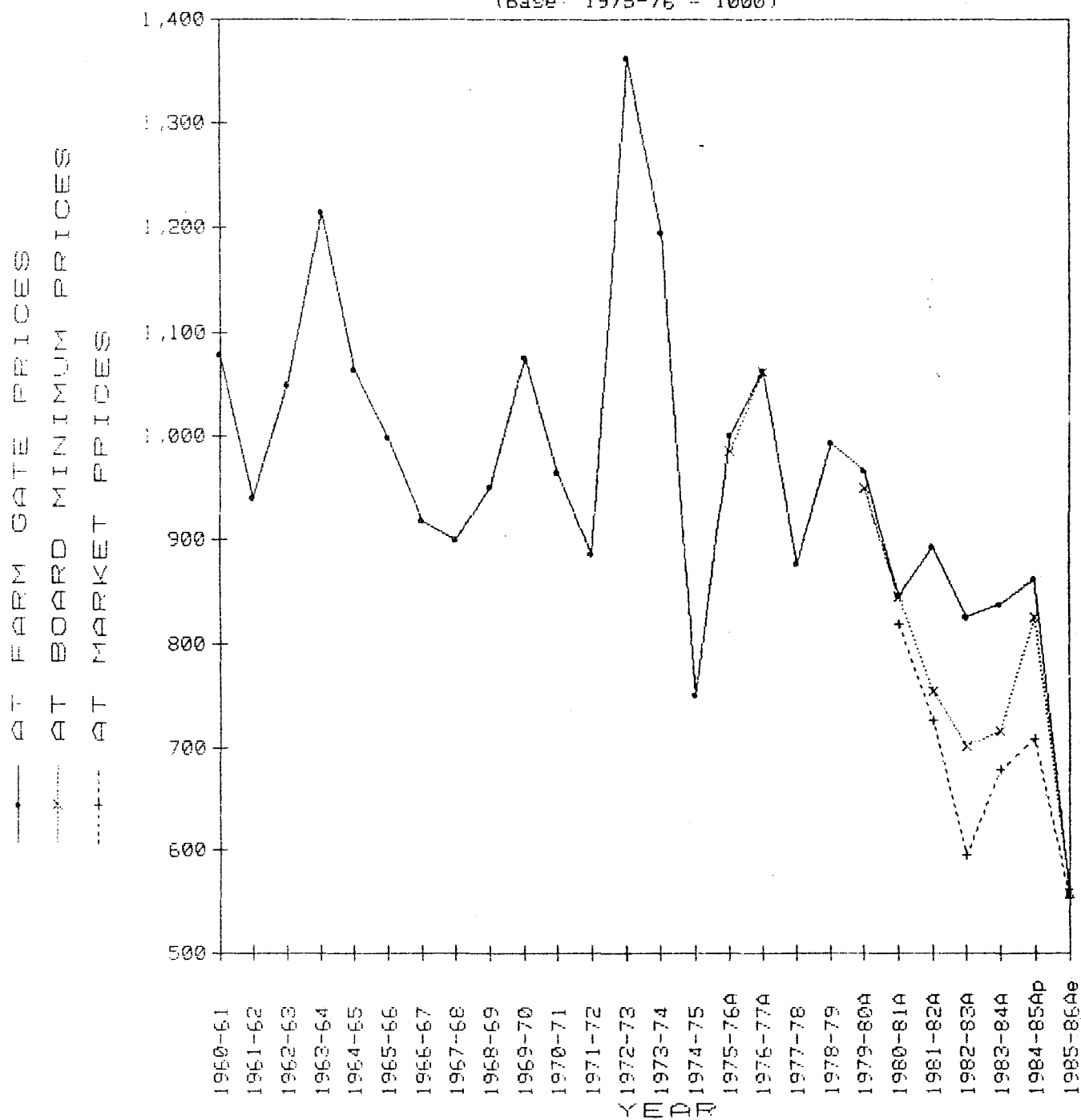
- overvalued exchange rate for much of the recent past;
- in summary, a classical cost price squeeze with farm gate terms of exchange falling consistently to a level that is now 26 per cent below the previous lowest point in 1974-75 (see Figure 1).

Given this background, past policies have tended at times to mask the seriousness of the situation and underlying trends that were occurring.

FIGURE 1

SHEEP AND BEEF FARMERS' FARM GATE TERMS OF EXCHANGE

(Base: 1975-76 = 1000)



p = provisional
e = estimate

Source: N.Z. Meat & Wool Boards' Economic Service.
24 JUN 1986

For example an analysis of Meat and Wool Boards' Economic Service sheep and beef farm survey data shows quite clearly that a high proportion of farmers were net borrowers over the last decade and that the proportion of total cash generated on-farm was decreasing. Figure 2 shows that in the 1983-84 season only 53 per cent of total funds for the year were generated on farm. This situation is not sustainable over the medium to long term. However, over the past decade farmers were able to borrow more, especially against inflating land values.

During the period from 1975-76 to 1982-83 land values rose approximately 2.5 times while debt/equity levels changed little; farmers simply mobilised their higher equity. This increase in land values (see Figure 3) was in effect the "safety valve" which in the short term enabled farmers to compensate for falling incomes - they simply borrowed more.

The evidence so far suggests that the problems now surfacing have been there for a period and are deep seated. The situation today with falling land values and incomes exposed as a result of the liberalisation policies have pushed many farmers into increasingly precarious financial situations.

While it is easy to pass off the situation as a result of S.M.P.s and other land development policies it is more likely that these were only symptoms of deeper domestic and international economic structural problems. For example in Australia and the United States farmers are experiencing much the same situation, particularly falling land values, without having had the previous benefits of S.M.P.s and national land development schemes. Similarly in New Zealand horticultural land values have decreased. The current situation most likely reflects reducing inflationary expectations, high real rates of interest and surplus products in world markets.

4.

THE PRESENT SITUATION

The fall in land values over the past two years, the removal of most supplementary payments (e.g. S.M.P.s), rising interest rates and inflation plus the strength of the New Zealand dollar, have combined to adversely change the position for farmers.

Farm incomes in the sheep and beef industry have this year fallen sharply. Currently they are at the lowest level in real terms in at least 25 years (see Table 1). Investment is at an all time low. Fertiliser use is currently at 40 per cent of the average use for the 1970s (and the fertiliser industry as a result is under enormous economic pressure), and the industry is in effect living off or eroding its capital base. Many farmers now have large cash deficits, and as well many now have serious equity problems due to the sharp decline in land values (see Figure 4).

The floating of the dollar has not been followed by the expected, and forecast adjustment in the exchange rate to compensate exporters who are now facing high interest rates, high input costs, removal of various Government payments, and falling overall receipts. Exporters are becoming non-competitive.

TABLE 1SHEEP AND BEEF FARM INCOME AND EXPENDITURE

(All Classes Average Sheep and Beef Farm)

	<u>1980-81</u>	<u>1981-82</u>	<u>1982-83</u>	<u>1983-84</u>	<u>1984-85(p)</u>	<u>1985-86(e)</u>
INCOME						
Wool	32,040	39,046	39,434	38,448	46,500	40,700
Sheep	28,317	32,086	34,521	36,154	43,000	20,900
Cattle	13,875	14,650	17,811	14,023	20,700	15,500
Cash Crops	7,480	8,228	11,657	14,205	15,300	15,000
Other	<u>1,540</u>	<u>1,576</u>	<u>1,951</u>	<u>1,945</u>	<u>2,400</u>	<u>3,200</u>
TOTAL	83,252	95,586	105,374	104,775	127,900	95,300
EXPENDITURE						
Fertiliser	8,074	9,785	10,275	10,801	13,800	8,400
Repairs & Maintenance	6,880	8,284	8,207	8,539	8,600	5,200
Interest	8,964	12,137	14,782	16,305	17,400	19,900
Other	<u>37,636</u>	<u>43,979</u>	<u>48,714</u>	<u>50,639</u>	<u>57,200</u>	<u>52,200</u>
TOTAL	61,554	74,185	81,978	86,284	97,000	85,700
NET FARM INCOME	<u>21,698</u>	<u>21,401</u>	<u>23,396</u>	<u>18,491</u>	<u>30,900</u>	<u>9,600</u>
REAL NET INCOME (base 1975-76 = 1000)	806	686	663	502	752	206

(p) provisional

(e) estimate

Note: Net income per farm (not per farmer) is required to meet drawings, tax, debt repayment and purchase of capital items.

Supplements are included in the above income sources where applicable.

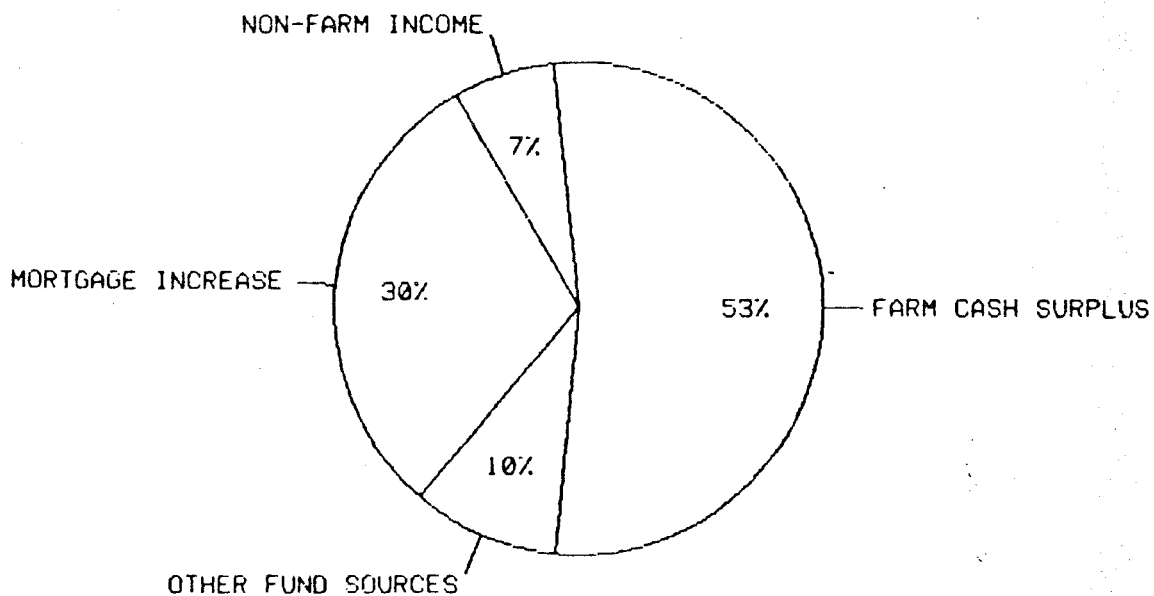
Source: N.Z. Meat & Wool Boards' Economic Service. 21 May 1986.

SOURCE AND APPLICATION OF FUNDS, PERCENTAGE ALLOCATION

(All Classes Sheep and Beef Farm)

FIGURE 2

SOURCE OF FUNDS



APPLICATION OF FUNDS

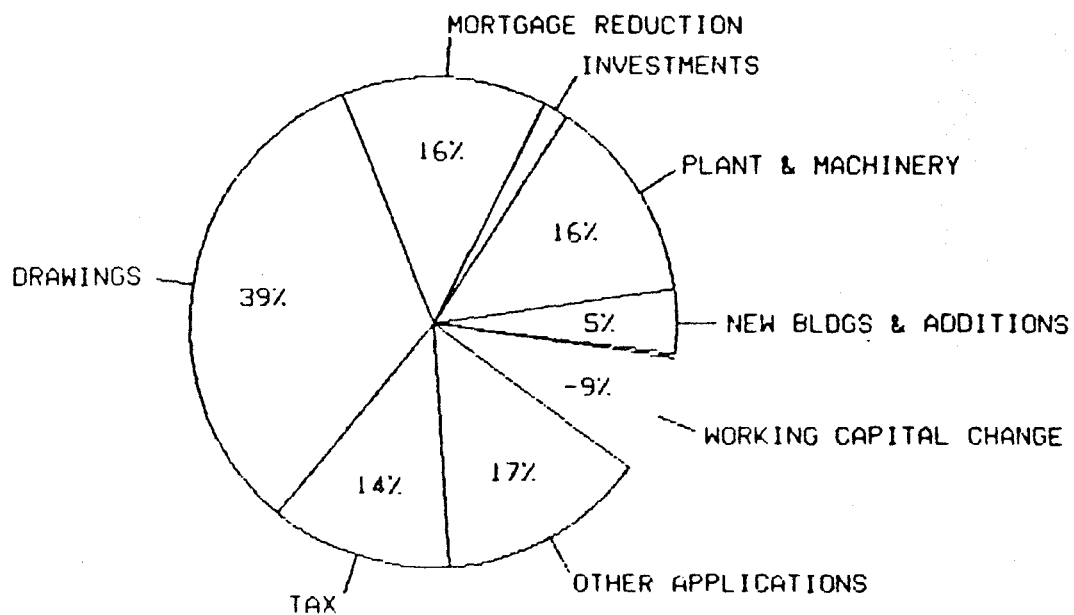
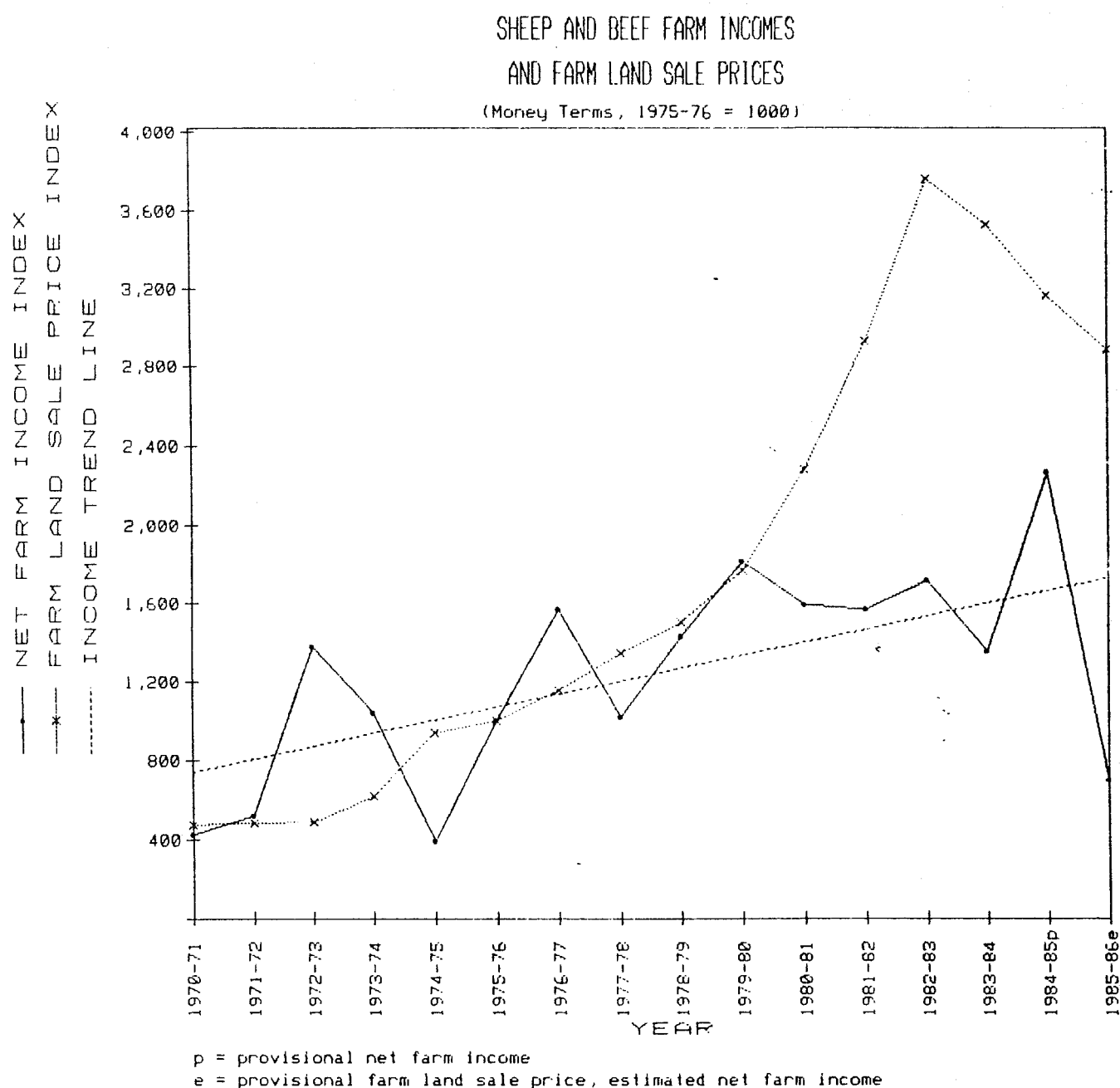


FIGURE 3



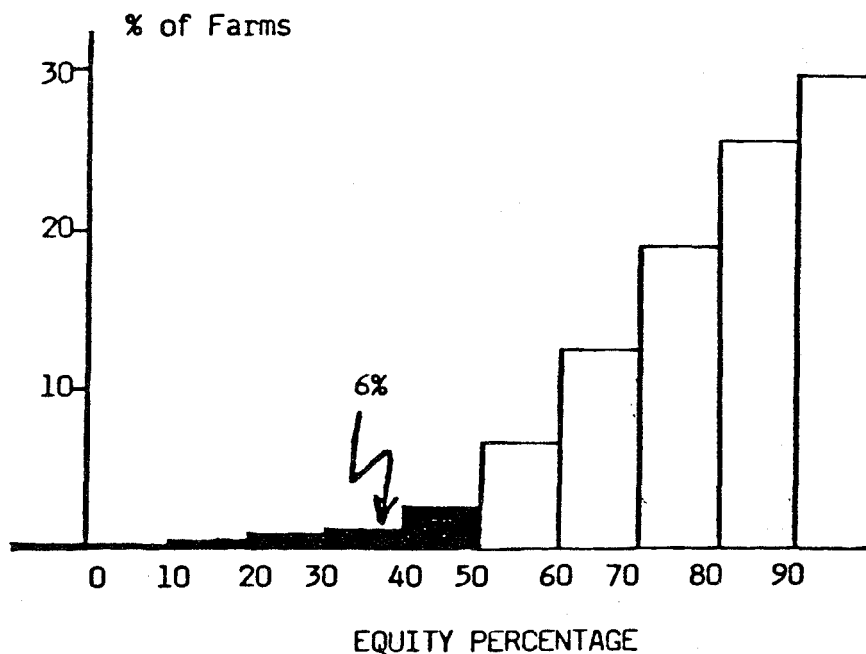
Source: N.Z. Meat & Wool Boards' Economic Service, Sheep and Beef Farm Survey. (SI/18)
Valuation Department (Combined Grazing and Fattening Land Sale Index).
24 JUN 1986

FIGURE 4

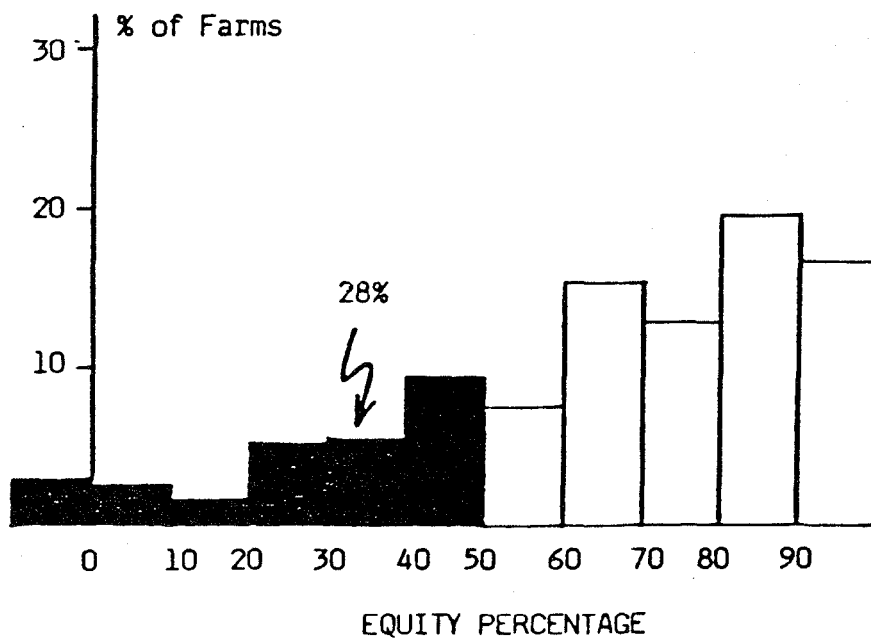
**DISTRIBUTION OF EQUITY AS A PERCENTAGE
OF TOTAL ASSETS**

(ALL SHEEP & BEEF FARMS, JUNE 1984)

A. Actual



**B. After a 50% Decrease in Land Values
and 30% Decrease in Livestock Values**



Clearly inflation has been and remains a major problem and needs to be addressed. By the end of this year our exporters will face an inflation rate two to three times that of our trading partners. (From 1972 to 1982 the difference was 1.5 times). The gap has been widening.

Exporters, and especially smaller operators such as farmers, cannot withstand the high (and fluctuating) interest rates, and high inflation coupled with the uncertainty of exchange rate movements. (For example between two wool sales, a given type of wool has varied in price by as much as 30 cents per kilogram or \$4,000 per farm).

Clearly inflation has to be addressed, but not at any cost. The nation needs to trade its way out of the present position and this necessitates a vital and thriving export sector. Many industry economists believe that Government should further reduce import restrictions and so remove cost penalties against the export sector. Removing only part of New Zealand's assistance and protective measures will inevitably result in imbalance, and distortion in the remainder of the economy.

Agriculture and exporters alike can, and will, survive a full market economy, but not a "half market" economy. As Aldo Dadone, Professor of Economics at University of Cordoba, Argentina, said in New Zealand recently when referring to agriculture's ability to survive in a market economy "without doubt when all distortions have been removed the answer is definitely yes". But he stressed the importance of timing and sequence. He suggested that the main trouble arising from a liberalised programme is that of an appreciating exchange rate. He stressed that the short term "pain of adjustment" could be longer than we expect.

He went on to say that:

"If the country starts the liberalisation programme by:

- (a) removing financial and exchange controls; and
- (b) eliminating export subsidies

and this is done before:

- (a) the fiscal deficit is cut back to near zero; and
- (b) the reduction in protection to the importable goods sector become really effective,

then probably the following chain of events will occur:-

If Government is borrowing in the internal financial market the rate of interest will rise, this will attract foreign capital that will increase the exchange rate, hence it will lower the relative price of the agricultural sector. Compared with the trend in agriculture prices, the rate of interest will be unbearable for the export-orientated agricultural sector.

Alternatively, if the Government is borrowing in external financial markets and follows a tight monetary policy to fight inflation, the exchange rate will anyway appreciate and the interest rate will also rise. Hence, the results will be the same."

Doesn't this all sound very familiar?

The sharp change in the economic environment in which farmers (and other exporters) find themselves today has placed them in a very difficult position.

Because of the depressed product prices within New Zealand's domestic economy, (brought about largely by the high exchange rate) and high input costs, the cash flows are completely inadequate to meet normal requirements for a large number of farms.

As many as one third of farms have a debt servicing level exceeding 25 per cent of earnings - some as high as 40 per cent. And in addition some 28 per cent of farms now have less than 50 per cent equity compared with 6 per cent two years earlier. The overall financial viability of the industry is being put at risk in the short run. Yet many of these units would be viable in the long term if they were given greater opportunity in terms of time to adjust. It is the speed of change which the industry has serious difficulty coping with especially when the speed of economic change bears no relationship to the biological cycles on which farming is based.

The drop in sheep and beef farmers' gross income this year is some 26 per cent or \$32,600 per farm when compared to last season, or around \$50,000 allowing for inflation. It would require at least a 31 per cent devaluation to lift returns to somewhere near last year's level.

For some products, e.g. lamb, the effect on schedule prices of a devaluation can however be quite high because of the high cost between farm gate and the point of export. For lamb a 10 per cent devaluation should lift schedule prices by 20 per cent (or \$2.50 on the carcase). For wool the figure is much lower - approximately 10 per cent devaluation for an 11 per cent lift in prices (or 40 cents per kilogram). But for a \$400 beef animal, around \$55 extra would be generated.

In the short run, farmers are being forced to severely cut expenditure to below maintenance levels, to destock, to "shrink back" the enterprise in every possible way simply to survive. For some, this is not sufficient and mortgagee sales are likely to occur on a scale not seen for 50 years. For some it is the only way out. For others a more gradual and balanced implementation of policies leading to the "more market" liberalised economy could have them survive, even flourish.

The effect of this on the wider agricultural sector is serious. In the meat and wool sector alone this represents \$1 billion less spent in the country. For dairying in the new season it could be \$0.7 billion down. The flow-on will be felt by all in the wider agricultural sector.

One special feature of the agricultural sector is that it is market responsive and has always been market led, particularly with respect to product mix. Figure 5 shows the trend in sheep and beef cattle numbers since 1971. The switch from sheep to cattle and cattle to sheep happened for one reason only - market driven signals. The growth in sheep numbers to 70 million occurred before S.M.P.s supported prices. S.M.P.s then pegged prices while inflation continued and sheep numbers began to decline from 1982-83 with supplementary prices ceasing at the end of the 1984-85 season.

The point that must be emphasised for policy work is that the agricultural sector in the New Zealand context is market responsive and more so than other sectors within the economy. Witness the rate of change today compared with other sectors. In particular the agricultural sector at the farm and farm servicing level is particularly exposed as a price taker with no opportunity to pass on increased charges. For example higher interest rates cannot be passed on by a farmer but must be paid in full. In contrast a domestic industry has the opportunity to build higher interest charges into its pricing structure.

The agricultural industry has nothing to fear from a fully liberalised market economy. The real problems arise when only part of the equation is in place, and the pace of change has been too great.

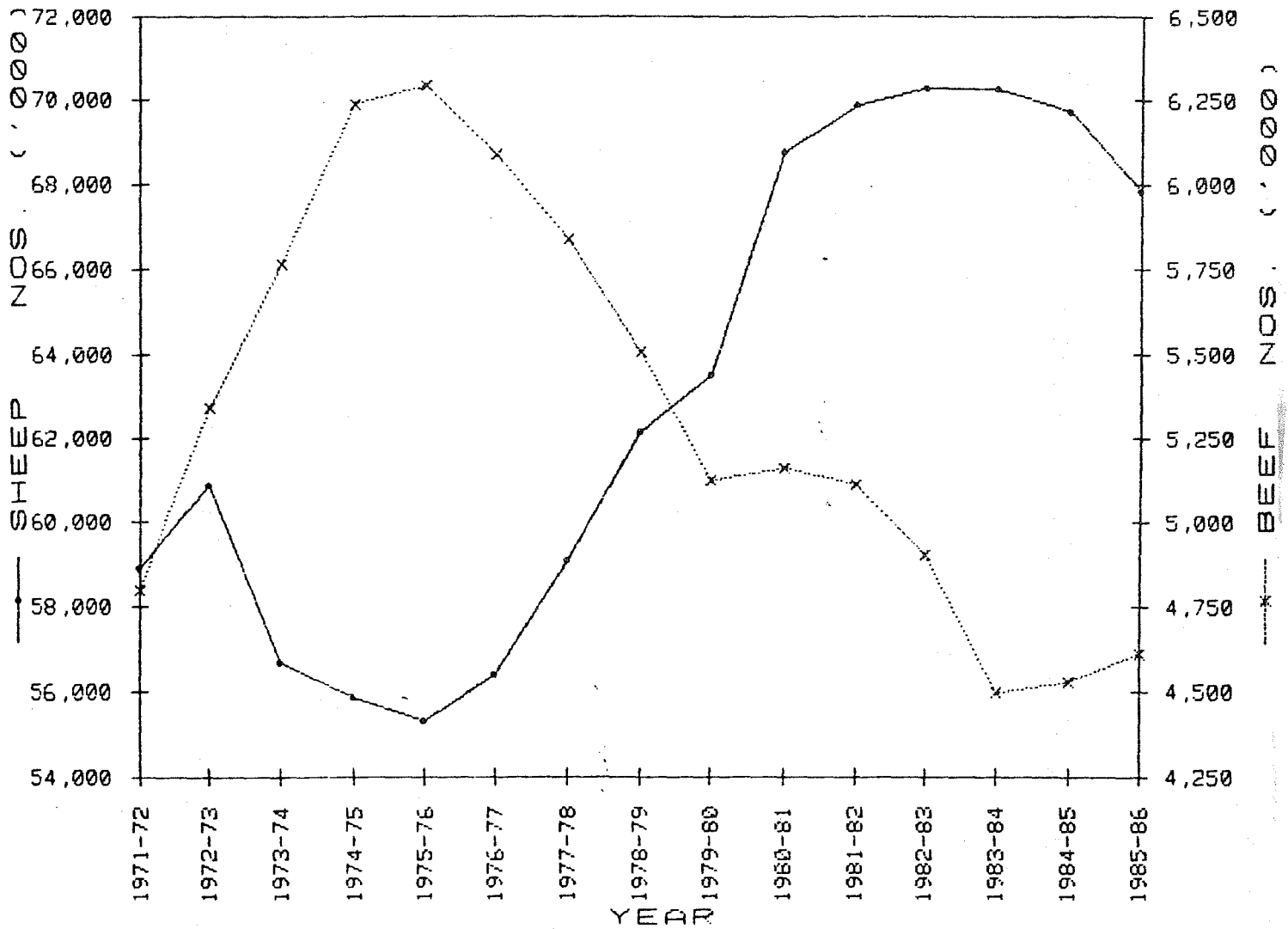
A continuation of the present policies will, unless exchange rates alter significantly, see sharp changes in the rural sector:-

- farm size will increase;
- an increasing proportion of farms will have corporate ownership;
- there will be more extensive farming - lower input, lower output systems, especially on hill country, fewer jobs;
- these lower farming inputs and outputs will force significant changes on:-
 - * farm incomes;
 - * throughput and profitability and employment in the transport, processing and servicing industries;
 - * the nation's export receipts from pastoral production will decline;
 - * rural communities will contract with some social impacts reaching into cities.

If inflation is brought under control, and farm gate returns improve some time in the future, the concern is that many of the producing/servicing businesses (be they farms, transport, processing industries or retail activities), which would normally benefit from this improved economic environment, will have been lost from the sector in this period of fast transition/adjustment. These businesses may not return.

FIGURE 5

SHEEP AND BEEF CATTLE NUMBERS 1971 TO 1985



Source: N.Z. Meat & Wool Boards' Economic Service.
Based on Department of Statistics data.
20 JUN 1986

What then? What will New Zealand look like with a sharp drop (20 to 30 per cent) in export receipts from agriculture (and other export sectors) two to three years out? Where are the alternative activities to take the place of the agricultural industry? What alternative employment opportunities, or G.D.P. generating activities, will we have in place in this time frame?

Our greatest single asset is undoubtedly our land resource and our ability to grow grass. What we have to do is to think laterally and seek out new and exciting ways to take greater advantage over other producers in this area, but we have to use this resource more effectively.

There are problems of access, and competition from subsidised output from other countries. Obviously a move towards greater free trade world-wide will be critical. But also critical will be our own internal cost structure. We must not undermine what is a technically efficient operation by our own high inflation rates. We cannot expect our trading partners to compensate us for our high internal inflation. Yet over the past decade this has been, and remains, more of an issue, than so called "weak market prices".

We have enormous opportunities to diversify our activity within traditional agriculture and most of these opportunities are in the areas of new products, and new markets. If we start by thinking of the lamb carcase, the bale of wool and the kilo of milk as raw materials only, we have made a major step forward. We have far too little effort being diverted into finding new markets and products which will consume our raw materials, and return appropriate prices.

The opportunity for much of our land resources to generate new and more reliable products on a farm scale is relatively limited. The problem of poor cash flow in the industry will not be overcome by simply restructuring the on-farm activities. But we can and must do more with our traditional raw materials. That is where the greatest diversification opportunities still lie. Furthermore industry organisation has got to be such that a reasonable share of any gains is returned to the producer.

Finally it is clear that we are attempting to redress in a short span of time an imbalance which has existed in the industry over a long period. Individuals can and will accept change up to a certain level and speed. Beyond those levels resistance is created and waste occurs.

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ECONOMIC LIBERALISATION AND DEREGULATION
IN THE NEW ZEALAND FORESTRY SECTOR

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SUMMARY

Liberalisation and deregulation are having, and will continue to have, a profound effect upon the forestry sector, particularly moves to establish a State Forestry Corporation. Wood supplies to the year 2000 will not be affected much. Beyond that, supplies will be lower and of poorer quality than was forecast due to reduced plantings and silviculture. Increasingly forestry will be market-led and take on an international dimension. Pressures to install modern processing technologies will intensify. The sector is adjusting to change and will survive. Adjustment problems are being created by the remaining impediments which deny forestry the full benefits of liberalisation.

Key words: Liberalisation, forestry sector, New Zealand Forest Service, State-owned enterprises.

*Chief Economist, New Zealand Forest Service. Views expressed are the author's own and do not necessarily represent those of the New Zealand Forest Service.

INTRODUCTION

New Zealand's forestry sector provides a good example of the application of the Government's deregulation and liberalisation policies. These policies are having a profound impact on the forestry sector. On the one hand, the environment in which industry in this sector operates is being changed considerably by the general measures taken to free up the economy. On the other hand, more specific moves to restructure the New Zealand Forest Service, in particular the establishment of a commercial State Forestry Corporation, will have a major impact on the sector.

The Government intervention in the forestry sector prior to July 1984 took the following forms:

- (a) general assistance policies;
- (b) employment policies; and
- (c) direct Government involvement.

Before discussing the impact of recent Government measures to remove these interventions it is necessary to provide some background information about New Zealand's forestry sector, the importance of the New Zealand Forest Service within the sector, and the future wood supply projections. This will illustrate the fact that a lot of pressure for change already existed within the forestry sector before the current moves to liberalise and deregulate the economy were made. These moves will now accelerate the rate of change in the sector and bring forward the timing of some of them.

NEW ZEALAND'S FORESTRY SECTOR

Definition of the Sector

For the purposes of the national accounts the forestry sector includes forestry and logging activities only, e.g., all forest growing and harvesting activities up to the forest ride (equivalent to the farm gate). However, when the forestry sector speaks of itself, it includes these activities along with those of sawmilling, panel board production, pulp and paper production, and timber merchandising. This expanded definition is the definition used throughout this paper.

Importance in the Economy

The forestry sector provides:

- 5.3 percent of New Zealand's Gross Domestic Product (1984) of which 1.2 percent is up to the forest ride;
- 2.4 percent of total employment, but nearly 10 percent of the industrial labour force;
- 7 percent of total merchandise export receipts in 1984-85 at f.o.b. prices;
- 2.7 percent of Gross Fixed Capital Formation.

Unlike the agricultural sector, changes which impact heavily on the forestry sector will not have major implications across a wide section of the New Zealand economy in the short run. But the impacts may be very significant on some rural communities.

The Forest Estate

Prior to the 1930s, New Zealand's wood processing industries were based largely on indigenous forests. In 1985, 94 percent of roundwood removals were from plantation forests. This compares with 64 percent in 1960 and 14 percent in the late 1930s.

The greater part of the exotic resource is in forests planted in one of two boom periods, namely, the late 1920s and early 1930s, or the late 1960s through to the present day. New planting levels were low from the late 1930s through to the 1960s. Since that time there has been a rapid increase in the area planted from 5000 ha per annum in 1960 to a level of 54 000 ha in 1985.

At 31 March 1985, New Zealand's exotic forests totalled 1.095 million hectares or about 4 percent of New Zealand's land area. The New Zealand Forest Service, as the State's forestry agency, continues to be the single largest owner of exotic forests, owning 52 percent of the nation's estate. Pinus radiata is the dominant species accounting for nearly 90 percent of stocked exotic forest area.

Roundwood removals from plantation forests totalled 9 million cubic metres. By 1990, this is forecast to increase to 11 million cubic metres and by the year 2000 to 17.7 million or, double the present cut. All of the increased wood supply is destined for export, for New Zealand is already self-sufficient in forest products manufactured from softwoods. Exports could thus increase four-fold by the year 2000.

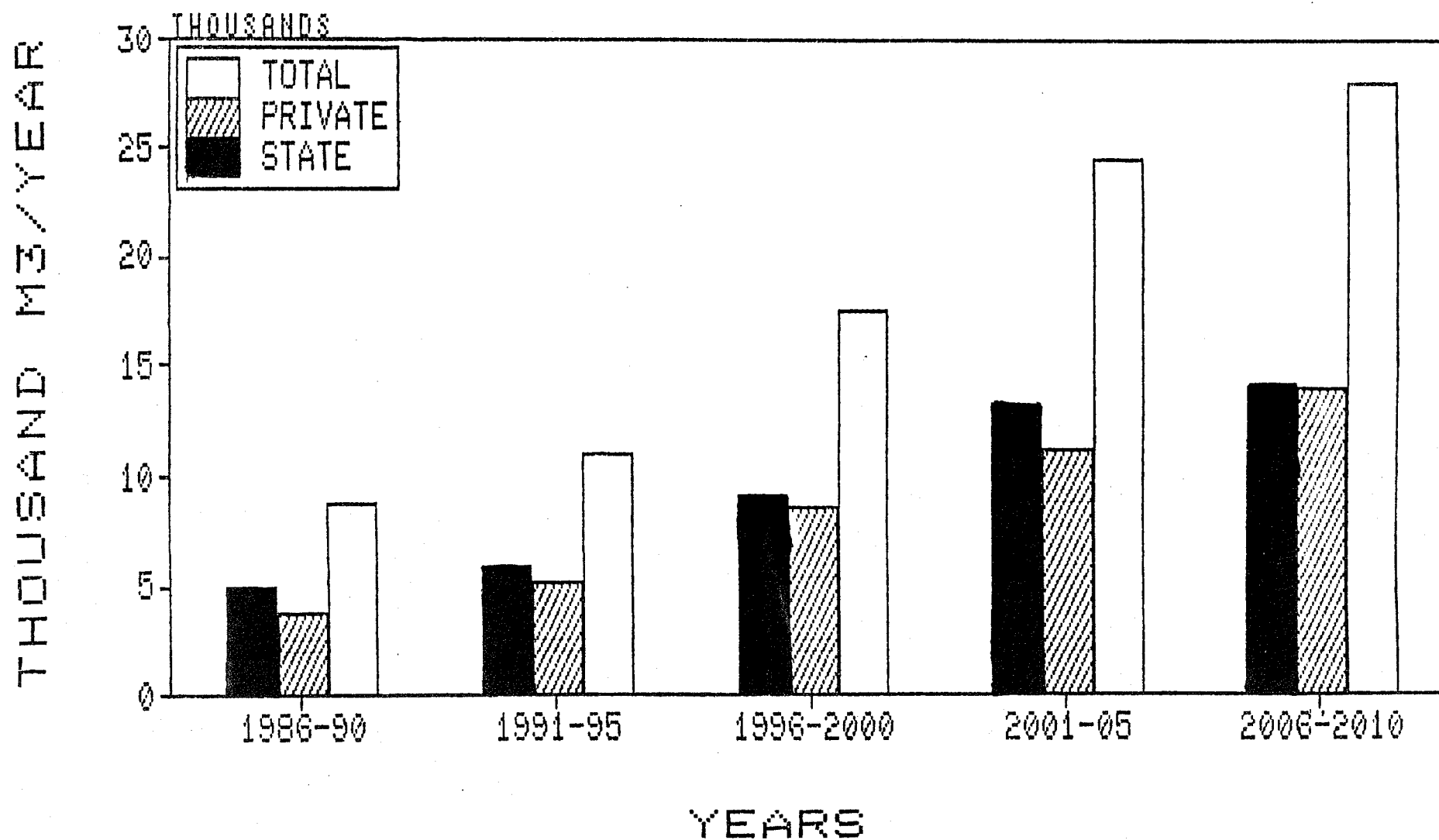
Figure 1 shows that the State will continue to be the dominant supplier of wood.

Today New Zealand's wood supply comes largely from the Bay of Plenty/Taupo region but the relative importance of this region will decline by the turn of the century. At that time Northland, East Coast/Hawke's Bay, Nelson/Marlborough and Otago will account for about 40 percent of New Zealand's wood supply. Increasingly, the new forests being harvested will be on steeper and more difficult terrain, necessitating increased use of hauler or cable logging. Logging costs will therefore increase. Further, because the new forests are more remote than the old ones currently being harvested, transportation costs to processing plants or export ports will also increase.

The characteristics of the increased wood supply will change because of intensive forest management, (silviculture) practices used on forests planted since 1960. Trees will be smaller as a result of being harvested at a younger age. They will produce wood of lower density, together with high-quality pruned butt logs and pruned

FIGURE 1

AVERAGE ANNUAL EXOTIC WOOD SUPPLY BY OWNERSHIP (000, S CUM)



sawlogs. About half the available wood supply in the 1990s will be in the form of logs too small to saw and as mill residues. This material could support new reconstituted wood industries such as pulp and paper mills and fibreboard plants.

Given this background it can be seen that general liberalisation policies will have little impact on wood supplies to the year 2000. Proposed changes to forestry taxation, and the establishment of the State Forestry Corporation are, however, likely to have a significant impact on wood supplies both in the short- and long-term.

All of the major wood processing companies receive part of their wood supplies from the New Zealand Forest Service. Tasman Pulp and Paper Company is the major purchaser of State wood taking about 40 percent of its 5 million cubic metres annual supply. Over 70 percent of Forest Service wood production is contracted to the four largest forestry companies. In 1990 about 60 percent of the Forest Service's production will still be committed, reducing to between one-half to one-third by the turn of the century. The average stumpage for all State wood sales for the year ended 31 March 1985 was \$12.52 per cubic metre. In comparison the average stumpage for an export log was about \$65.

Technology in the majority of New Zealand's sawmills is not modern, for the industry has a history of supplying the domestic market where sawn timber was under price control until 1984. Considerable expenditure on new and existing processing plants will be necessary if the increasing wood supply is to be exported as processed products. This has already begun to take place e.g. Baigents opened a new sawmill at Eves Valley near Nelson earlier this year. Foreign ownership, joint ventures or overseas loans are likely options for raising the capital for these plants.

It is against this background of a sector about to face major changes in the volume, quality and location of its raw material, and a change from a predominantly domestic to an export-orientated sector, that this paper covers the current Government measures to liberalise the New Zealand economy.

GENERAL ECONOMIC MEASURES

The economic environment in which the forest industry operates has changed considerably over the last two years. The general effects of "liberalisation" on industry are well known and, as such, are not discussed here. But some of the measures have a more direct effect on the forest industry. Among these are:

- (a) removal of import licensing on a number of forest products;
- (b) the elimination of export performance incentives; and
- (c) the floating of the NZ dollar.

Removal of Import Licensing

For most processed forest products for which there are local manufacturers the Government policy in the past was to have strict import licensing and apply very high tariff rates. Printing paper and toilet tissue are two examples of protected forest products. Under the import licensing liberalisation measures all products for which the import licence tenders attracted less than 15 percent premium are to be removed from licensing requirements. These products will be on a licence-on-demand basis for one year from July 1986 and free of licence from then on. At the same time, all tariff rates above 25 percent are to be reduced to that level or below. The effect of these measures has been to remove virtually all forest products from import licensing and in many cases to lower tariff levels as well. The effect of these changes will be dramatic on some forest products producers, especially those that relied on controls for profitable operation.

Elimination of Export Performance Incentives

The elimination of export incentives has been likely for some time now, especially because of overseas pressure for their removal. Under the Closer Economic Relations Agreement with Australia, incentive payments on exports, to that country at least, were to be eliminated by 1987. The new Government decided to eliminate virtually all export incentives on all exports by 1987. Forest companies in general received 10.5 percent of the f.o.b. value of exports as the incentive payment. Their export incomes will thus be reduced by that amount from next year.

Protecting industries from competition or supporting exporting through taxpayer subsidies cannot be justified in the forestry sector, for most of the beneficiaries are large, long-established industries. It is in the interests of the consumer and the taxpayer to make these industries perform efficiently in a free market environment.

Floating of the NZ Dollar

The sector's adjustment to these changes has been made traumatic by other changes in the economy. The important one among these is the floating of the NZ dollar. The wide fluctuations in the exchange rate in recent times have added a major new problem for exporters of forest products to cope with.

The Threat of Take-overs

A new factor that has entered the corporate scene is the threat of take-overs. Because of this many large forest industry companies which have shown high rates of return on low-valued forest assets are now considering revaluations of these assets. The absence of a generally acceptable formula for forest valuations has been a worrying problem for the industry. There is no consensus yet, but the immediate threat has been strong enough for some companies to devise their own ways of valuing their forest assets to reduce this take-over risk.

State-supplied Inputs

Many State-supplied inputs have been priced at less than their cost of production. There is now a Government policy to progressively raise the price of these inputs until the full cost of supply is recovered. Of particular significance to the forestry sector are the policies for increasing electricity tariffs and State wood pricing policies. In the case of the latter, the prices of State wood have in general been lower than world prices (adjusted for transport costs) and lower than the full cost of production. Because the State produces about half of the nation's annual roundwood, the prices it charges to its customers affect not only processing industries but also other suppliers of wood. Private growers' decisions about new plantings are based in part on the current wood prices; concessionary State prices therefore have the tendency to depress the level of planting undertaken by private growers.

In addition they affect both the processing options chosen by wood processors and the efficiency with which processors run their plants; there is some evidence that suggests wood of sawlog quality has been pulped in the past. Given the present static wood supply this means New Zealand might be producing less sawn timber than it could. Low wood prices could encourage processors to adopt processing options requiring high volumes of low-cost wood and therefore favour pulp and paper production at the expense of sawn timber production.

Proposed Forestry Taxation Changes

In the Government's Economic Statement of 12 December 1985, the Minister of Finance announced that the Government would be introducing new schemes for primary sector taxation. The reason for the new schemes is to tax all rural activities according to the normal income tax principles that apply to all other taxpayers. By treating all taxpayers in the same manner all investments will be treated in the same way. The proposed new tax regime for forestry is therefore designed to ensure that investment in forestry is neither encouraged nor discouraged by the tax system compared to other investments. The Report of the Consultative Committee on Primary Sector Taxation of June 1986 contains details of the revised taxation regime for forestry.

Basically the annual expenditure of all forest growers will now be treated in four separate categories. Currently it is immediately deductible in the year in which it is incurred against income from any other source. The four new categories are:

- (1) Costs of a capital nature where the value added is reflected in the asset will be capitalised and neither depreciable nor deductible, e.g., land costs and associated legal and survey costs.

- (2) Costs of a capital nature expended on an asset with a limited life will be capitalised and depreciated against current income from any source in the year in which they are incurred, e.g. roads, fences and firebreaks.
- (3) Costs directly related to the tree crop will be capitalised to a cost of bush account which will become deductible when revenue is earned from that expenditure in the form of forest income from sale of the forest, sale of thinnings and sale of wood at clearfelling. These costs are the full costs of forest seedlings, planting, releasing, blanking, pruning, thinning, fertiliser and land clearing.
- (4) Costs incurred in the maintenance of the forestry business will be deductible in the year incurred from income from any source. Repairs and maintenance on land improvements and on machinery and equipment used in the forest, interest on borrowed money and land tax.

The proposed tax regime is considered non-neutral for forestry for two reasons. Firstly, it penalises long-term forestry investment because the cost of bush account is not indexed for inflation, it being based instead on historical costs. As a result it is likely to be worthless in 30 years' time, when the crop is harvested, if inflation continues at present rates. Secondly, it is non-neutral with respect to other rural land users because Land Tax has not been abolished. No other rural land users pay Land Tax. The Brash Committee recommended its abolition, while the Minister of Finance has agreed to give further consideration to the matter.

REMAINING IMPEDIMENTS

Liberalisation has to go a fair way further before the forest industry could gain full benefits from it. Part-liberalisation, in fact, has created problems. Several impediments to the operation of a free market still exist in forestry. These include restrictions in the labour market, application of the Town and Country Planning Act, restrictions on foreign ownership of land, and the dominance of the State in the supply of wood.

The Labour Market

An entrepreneur, ideally, should be able to manoeuvre his/her operation to reflect market signals so that he/she can continue to remain profitable. But as it is, there are major limits to this manoeuvrability. One limitation is labour market protection. The industrial relations system is characterised by a high degree of statutory regulations. Additionally, the wage round is started off by the negotiations of the major trend-setting awards, which are then transmitted throughout all industries through the maintenance of relativities.

The situation is compounded when there are several unions that cover one industrial site. For example, Tasman Pulp and Paper Company's Kawerau site has thirteen unions. Comparison with overseas

countries suggests that New Zealand forest industries are over-manned perhaps by as much as 25 percent when compared with Canadian forest industries. Furthermore, the gap is widening: Canada reduces manning levels on average by 4 percent each year. This has major implications for the international competitiveness of our forest industries.

The Town and Country Planning Act 1977

Many county councils restrict the use of land for forestry purposes to certain classes of land. These are usually classes considered marginal or unsuitable for pastoral agricultural production from an economic and/or land capability point of view. Small-scale forestry on farms may even be restricted by some counties. As a result of these restrictions many forests have been planted on remote and steep country, thereby increasing logging and transportation costs to the sector, reducing the profitability of forest growing, and increasing costs to processing plants. The New Zealand Forest Service's activities have been further restricted by the need to seek approval from interdepartmental Land Use Committees before purchasing existing farmland or land considered capable of being developed for pastoral agriculture.

Foreign Ownership of Land

Foreign ownership of land is controlled by the Land Settlement and Promotion Act 1952, the Overseas Investment Commission, and the Land Valuation Court. At the present time it would be almost impossible to sell a forest to a foreign owner because of the restrictions on the sale of forest land. Overseas companies operating within New Zealand have, however, been able to enter into joint venture arrangements with existing New Zealand forest companies for specific afforestation projects. Examples are the BP-Fletcher Challenge agro-forestry joint venture on the East Coast of the North Island and the Shell-NZ Forest Products joint venture in Northland. Both projects required Cabinet approval and are restricted to a total area of 50 000 hectares within a given region of New Zealand.

The New Zealand Forest Service

One of the most significant impediments to the operation of a free market economy for New Zealand's forestry sector has been the dominance of the New Zealand Forest Service as the major supplier of wood. Measures to remove this impediment are currently under way with the restructuring of the department. These measures include the establishment of a Department of Conservation, incorporating the indigenous forest management functions of the department, the Maritime and National Parks and Reserves functions of the Department of Lands and Survey, and the Wildlife and Historic Places Trust functions of the Department of Internal Affairs. The new Department of Conservation will be charged with being the Government's agency responsible for conservation. A State Forestry Corporation will take over the commercial exotic forestry and sawmilling activities of the Forest Service. Policy advice, sectoral servicing, regulatory functions and research activities (i.e., the Forest Research Institute) will form a new Ministry of Forestry. All three new Government agencies will come into operation on 1 April 1987.

THE STATE FORESTRY CORPORATION

In a recent speech the Minister of Finance, Mr Roger Douglas stated that the Government was committed to the maintenance of a strong State trading sector. "That efficiency is not just important for economic reasons: it is also central to Labour's policies of social equity", he said. By an efficient public sector he said he meant one which gives the public of New Zealand a better service from public sector organisations at a lower cost. Further, Government has a responsibility to make sure public money spent on commercial activities goes into profitable areas. In New Zealand the State trading sector produces a range of goods and services that are fundamental to the running of the economy.

The size of Government State trading organisations is very large. Thirteen of them, including the New Zealand Forest Service, operating in non-financial areas of trading have total assets around \$27 billion. Accordingly they have major impacts on the economy.

The Labour Government has stated that it will not privatise State trading activities or corporations. Instead it has developed a policy of "State Owned Trading Enterprises" (SOE's) to bring about greater efficiency in the trading activities of Government organisations. The commercial activities of the Forest Service will become one of these enterprises next year. In the past the New Zealand Forest Service has been expected to manage its forest lands for multiple objectives and to achieve a balance between these. Some of these objectives were commercial and others non-commercial.

- (a) Commercial sawmilling and wood production goals;
- (b) Conservation, recreation, soil stabilisation and environmental values; and
- (c) Wider social goals such as regional employment.

Under the SOE policy Government is deliberately distinguishing between commercial and non-commercial objectives. All of the above objectives are still considered relevant for Government. However, it wishes there to be transparency between these activities and therefore greater public accountability for these activities.

There were two sources of pressure that have led to the restructuring of the department. Firstly, there was public dissatisfaction with the management of the nation's indigenous forests and environmental administration. Public pressures to restructure the Government organisations responsible for environmental and conservation management and policy had been growing since the mid 1970s. A Government-appointed working party last year recommended the formation of a new Department of Conservation which as one of its functions would take over the indigenous forest management responsibilities of the Forest Service.

Secondly, there was increasing concern about the accountability and profitability of the Forest Service's production forestry activities. These activities were being treated as non-trading Government activities and as such were not subject to normal commercial accounting practices. Instead they were subject to the normal cash flow and consolidated revenue accounting procedures of non-trading Government departments. These accounting procedures made it impossible to undertake financial and economic analyses of the department's forestry activities. For two years in a row, 1977 1978, the Government Auditor tagged the department's accounts because of the lack of detail in them on asset holdings. In 1980 a subcommittee of the Public Expenditure Committee undertook a review of the department's financial management. That committee was chaired by Mr Ian McLean and had Mr Roger Douglas and Mr Michael Cox as the other members.

This committee also recommended the restructuring of the department's accounting system. In 1980 the department appointed a Financial Advisor whose task was to establish a commercial accounting system for the department's trading activities along with an appropriate accounting system for non-trading activities. This task was severely compromised by the need to have an accounting system still capable of satisfying Treasury's cash flow accounting requirements.

In the Government's "opening of the books" exercise following the general election in June 1984, the Treasury stated that "the value of Forest Service's exotic production forests is about \$4.5 billion, which is more than the reported assets of the Fletcher Challenge Corporation. An increase in the return in the Forest Service's exotic forests of 4 percentage points (which does not seem unreasonable) would increase national income by 0.5 percent". Treasury considered the production forestry activities of the department to be essentially commercial.

The Commercial Division of the Forest Service owns and operates two sawmills, one at Waipa in Rotorua and the other at Conical Hill in Tapanui. Both sawmills, are large by New Zealand standards. At present, the Forest Service processes 6 percent of its roundwood through these two mills and their associated processing plants. Commercial Division was set up in the 1940s to demonstrate the use of the first cuttings of pinus radiata as a building material and to show that it was an economic alternative to indigenous timbers. Today the Division acts and is seen as a full commercial entity in an established exotic sawmilling industry. It is operated as an independent commercial organisation within the Forest Service under normal commercial accounting principles. Each year it produces an annual report and balance sheet.

In their publication "Economic Management : Land Use Issues" of 30 June 1984 the Treasury expressed the view that the sawmilling activities should be established as a "State Owned Trading Enterprise" within the department. All production forestry activities of the department should be organised in this way too. In September 1985 the Government made a decision to establish a

commercial Forestry Corporation covering both activities. In late February 1986 the Government appointed an Establishment Board to oversee the establishment of the Corporation. On 15 May 1986 the Board reported its recommendations to Government. The principal objective of the corporation is "to operate as a successful business enterprise". It will come into being on 1 April 1987 and will operate under a board of directors to be appointed by the Government. The new Department of Conservation and Ministry of Forestry will also come into being at the same time. Then the New Zealand Forest Service will cease to exist.

LIKELY IMPACTS OF LIBERALISATION AND DEREGULATION

Impacts from General Economic Measures

The removal of import licensing, coupled with the CER Agreement, has already resulted in moves to modernise some processing mills, in particular pulp and paper mills. The number two paperboard machine at NZ Forest Products, Whakatane Board Mills, closed indefinitely earlier this year with the loss of 210 jobs. A further 300 jobs will be lost over the next two years at Forest Products' Kinleith site as a result of modernisation programmes. Increasingly the forestry sector is having to take an international outlook rather than a domestic outlook. It is increasingly becoming market-led rather than production-led.

The elimination of Export Performance Incentives and the floating of the NZ dollar have tended to reduce the international competitiveness of exporters. Export volumes and receipts are down on previous years for all forest products. The sawmilling industry is going through its worst crisis since the depression, for not only are export volumes down but also domestic sales. Some mills may not survive the crisis. However, economic liberalisation alone cannot be blamed for this. A good part of the down turn is related to a fall in overseas demand arising from a fall in the growth of overseas economies, in particular Australia.

Labour market restrictions have further reduced the international competitiveness of exporters. As mentioned earlier, our processing plants are overmanned by international standards. Pressure will continue to mount for a removal of these restrictions and further redundancies in the processing sector can be expected.

Higher input costs for State-produced resources, especially electricity, gas and wood should result in more efficient use of these resources. In the short term they are further reducing the international competitiveness of exporters but in the longer term these increased costs and the changing quality of the wood supply should result in adoption of new, more efficient technologies from overseas and the developments of new technologies within New Zealand. A greater differential between the cost of low-quality wood and high-quality pruned sawlog material should favour the expansion of plywood and sawn timber manufacture at the expense of pulp and paper production.

Companies owning large forest estates are now vulnerable to take-overs because their forest assets are undervalued. If foreign ownerships of land restrictions are liberalised, the vulnerability of forestry companies to take-overs will increase greatly. As a result moves to find an acceptable method for valuing standing forests will accelerate. Revalued forest assets in some companies' balance sheets could result in quite poor returns on assets employed, adding further pressure for increased efficiency in the sector.

The proposed taxation changes if implemented are likely to result in less new land being planted in forests and some harvested areas may not be restocked. Because pruning and thinning costs must be carried forward in a "cost of bush account" until the time of harvest, there is likely to be a reduction in the area of forests intensively tended. Less high-quality pruned sawlog material will result and consequently a narrower range of raw material for processing and exporting. Increased production thinning will be encouraged to reduce the cost of bush account. Early clearfelling will also be encouraged, since this will reduce the number of years that costs have to be carried forward in the cost of bush account. Pulp and paper, and reconstituted wood production will be favoured at the expense of plywood and sawn timber production.

Forest owners are likely to practise grazing and agro-forestry wherever possible because of the early and increased cash flow these activities create. Forest owners may deliberately sow grass to increase grazing opportunities in existing forests and sacrifice some wood production. A move to agro-forestry should increase the production of pruned sawlogs.

Impact from the Establishment of the Forestry Corporation

The corporatisation of the commercial activities of the Forest Service will have a profound effect, not only on the department itself, but on the whole forestry sector in New Zealand. On the face of it the Forestry Corporation appears to be in a position to dominate the sector. Industry has raised concerns about its possible monopoly behaviour. However, in the short run the Corporation will be quite limited in its commercial opportunities by existing contracts with large forestry companies. Much of the resource is too young to use - 58 percent of the resource is less than ten years old and 90 percent less than twenty years old. The growth of the Corporation will be severely constrained in the short term by the immaturity of its plantation forest holdings. Significant growth in production is a decade away.

Expenditure on pruning and thinning the Forest Service's plantation forests currently results in a cash deficit of almost \$100 million annually. With full overhead recovery, payment of taxes, interest on new loans, and a return on shareholders' funds the Establishment Board believes that under the current cost structure of the Forest Service there would be very little economically viable forest plantings. Unless the cost structure of the Corporation can be reduced to competitive levels, few areas of forests are likely to be

planted and some logged areas will not be replanted. Many forests may not be pruned and thinned because of cash flow constraints, thereby reducing the potential quality of wood produced from the forests. This could affect the future earnings of the Corporation. Some forests in the more remote locations and on steeper terrain may not be logged. In fact, the Corporation may not be prepared to take over these forests. Disinvestment in production forests will result in a declining forest industry if costs are not reduced. Reduced planting and disinvestment would result in rural unemployment and the possible collapse of some communities. Rural communities on the East Coast of the North Island and West Coast of the South Island will be especially vulnerable.

Staff redundancies could result from the reorganisation of the Forest Service, for each of the three new organisations taking over its functions have been told they must be "lean and hungry". The greatest redundancies, if any occur, will be in personnel involved in forest growing and administration activities. Considerable personal and economic hardship could result for some people. Many could have to relocate from remote rural areas to cities and find employment in alternative sectors of the economy.

Many benefits can be expected from transferring the State's production forestry activities to a Forestry Corporation. These activities will be placed on a commercial basis for the first time. This should result in more efficient management of the nation's State forests and a greater return to the taxpayer. Greater public accountability will be possible because a commercial accounting system will exist and annual balance sheets produced. Better investment decisions on where to plant forests and on what processing to undertake will be made because these will become entirely commercial decisions without political influence or direction. Wood sales will be made on sound commercial principles.

In the past all major sales of State wood have required a Cabinet decision. The Corporation will be able to take a marketing approach to its operations, rather than the production approach of the Forest Service. More emphasis on overseas marketing is likely to result, particularly if the domestic processing industry is unable to meet export prices for its raw material. Some existing long-term contracts may be renegotiated. The Establishment Board has recommended an early renegotiation of the Tasman Pulp and Paper Company's contracts.

Considerable debate is likely to be generated over the valuation of the forest assets when the Corporation takes over from the Forest Service. The Establishment Board is of the view that the valuations must reflect as accurately as possible the expected net earnings of the forest estate, i.e., they should be valued as close as possible to a realistic market value. The Forest Service has indicated that the exotic forests may have a value of about \$3 billion, while the Treasury estimate is \$4.5 billion; the Board reported to Government that these are probably substantially overvalued. The valuation of the forest assets handed over to the Corporation is important for it will affect the level of debt the Corporation has and its ability to meet its required rate of return.

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NEW MANAGEMENT STRATEGIES FOR THE FISHING SECTOR

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S U M M A R Y

No ideal fisheries management strategies are available. NZ, however, as a result of the unique context of policy development, is leading the world in relying on output controls to increase economic efficiency. The bulk of New Zealand's finfisheries are now managed by an Individual Transferable Quota system introduced in 1982 which has been largely successful. This system is being extended to inshore fisheries from 1 October 1986 in conjunction with an adjustment assistance programme.

Key Words: Common Property, Individual Transferable Quotas (ITQs), Fisheries Management.

Introduction

Few activities are more difficult to manage than fishing. This is because, no matter what the political or economic climate, regulation of fisheries is necessary to satisfy economic and biological objectives.

Considerable sympathy should therefore be extended to fisheries managers. They have to deal with managing fisheries despite the variable nature of natural fish stocks, the multi species nature of fisheries, difficulties in assessing safe biological yields and an economic activity characterized by the 'tragedy of the commons'.

Private property rights in common property fisheries are secured only upon capture and the marginal cost of catching extra fish consists only of direct fishing costs. No price is paid for 'fish in the sea' and the opportunity cost for a fisher not fishing is zero. This is unlike a landowner whose opportunity cost of farming is the rent he could receive from the land if he leased it. Because the opportunity cost of the fish is zero, fisher will expand effort beyond a point where the profit from the fishery is maximised to a point where average fishing costs equal average revenue. The common property nature of the stock therefore means that in most fisheries, economic rent, or super-normal profits, is dissipated. Without removing the basic common property element, the best that can be achieved from a fishery is therefore 'normal' market returns on capital and labour employed. (In some fisheries where the number of participants is small or where 'patch' fishing by individuals is assured through geographic isolation, 'de-facto' property rights may exist and the accrual of economic rent may be sustainable). The major justification for Government intervention therefore is that, by administratively removing the common property element from fisheries national income could increase through increased surplus.

Fisheries managers have a number of tools which can be applied to solving the 'tragedy of the commons' and the tendency for investment

in fisheries to increase to a point where only normal returns are earned. They generally fall, however, into two categories: attempts to control the inputs of fishing operations and thus indirectly control investment and fishing effort; or direct control on the output of fishing operations through direct restrictions on catch or area fished.

Input controls include controls on season length, vessel capacity, crew, gear restrictions and other attempts to reduce the efficiency of vessels. The basic problem with the use of these controls is that they either do not control investment or if they do, they only do so by dissipating economic rent by reducing efficiency and increasing unit costs of catching. The substitutability of factor inputs (such as labour for capital), technological change increasing efficiency and the ingenuity of fishermen combine to generally make attempts to rely solely upon input controls unsuccessful in permanently reducing investment and catching costs. A further problem with input controls is that they also require regulators to make judgments on resource allocations between competing groups.

These problems have plagued management programmes in Europe and North America where input controls are relied upon.

Output controls, such as catch quotas, however, provide opportunities for improved efficiency when they are allocated to individuals. They are analogous to harvesting rights for other crown assets such as forestry where a restriction is set on the quantity of output with reasonable flexibility to allow harvestors to choose the most efficient means of production. Output controls in the fishing industry, however, are a lot more difficult to implement due to the variable nature of catches and enforcement difficulties.

There is no 'ideal' method of fisheries management and a mix of output and input controls will always be used in managing fisheries. New Zealand however, has led the world in relying to a greater extent on the use of output controls to manage fisheries, finfish in particular. To understand reasons for this it is first necessary to examine the context of policy development in New Zealand and thus identify some of the preconditions which make the use of output controls a more viable option.

Context of Policy Development

The Deepwater Fishery:

A number of factors contributed to the fundamental reappraisal of the direction of fisheries management policy in the early 1980's. New Zealand's deepwater fishery was developing quickly at that time, particularly following the declaration at the Exclusive Economic Zone (EEZ) in 1978 and the commercial development of orange roughy in the early 1980's.

A review of deepwater fisheries management policy was initiated by Government in 1982. Until 1982, Government's allocation strategy was to give first preference to New Zealand domestic vessels, second preference to foreign vessels involved in joint ventures with New Zealand partners and lowest preference to foreign licensed vessels.

The deepwater review in 1982 was due to three important factors. Firstly, New Zealand companies were increasingly interested in importing domestic vessels and it was at this time that two large 85 metre freezer trawlers were imported by Fletcher Fishing Limited. While the motives for investment were no doubt based on sound commercial judgements, government at the time was also apparently concerned that a 'rush' of domestic investment into deepwater fisheries may occur motivated from a desire to gain strategic access to the resource as much (if not more) than by commercial judgements. Given the doubtful viability of domestic involvement in the fishery at the time, there was at least the possibility of internationally uncompetitive domestic vessel operators, encouraged into the fishery by the 'New Zealand first' policy getting into financial difficulties and then seeking government assistance. A policy was thus desired which would enable greater flexibility for harvesters to choose the lowest cost method of harvesting.

Secondly, the increasing value of orange roughy in particular made this fishery difficult to manage and wasteful competition between vessels in the fishery increased. Management at the time was through the setting of an overall quota which was competitively fished on a 'first come - first catch' basis. This led to vessels lining up on fishing grounds at the start of the orange roughy season ready to put nets in the water at midnight when the season opened with a subsequent frenetic rush for fish until the total quota was filled. Not only was excess catching capacity encouraged by this approach, but uncertainties as to catch quantity and timing made planning of marketing and processing strategies difficult for participants.

A third motive for the review was the increasingly fractious debates between domestic and joint venture fleet operators about the share of total allowable catches which should be allocated to each. Government, having to make annual allocation decisions, often found itself the 'meat in the sandwich' in these disputes and invariably pleased no one. Moreover, there was little likelihood that annual administrative decisions on allocations would ensure the most efficient harvesters gained access to the resource. The annual nature of these decisions also gave insufficient tenure to participants to plan investment in the fishery.

All these factors combined to result in the adoption of individual transferable quotas (ITQs) to manage deepwater trawl fisheries from March of 1982. As the name implies, ITQs are specific tonnages of fish allocated to individuals. These allocations are transferable in whole or in part. Allocations of nine deepwater trawl species were made to ten major companies, based on a formula which took account of investment in domestic deepwater harvesting and processing capacity and onshore throughput. The quotas had a term of ten years. A competitive fishing quota was left open to allow other vessel operators to expand into the deepwater fishery. Government was thus able to reduce, but not eliminate, its role in the allocation of quota. Some subsequent administrative adjustments were made to quotas by changing their geographical distribution, although total tonnages allocated to each of the ten companies were not reduced. Holders of ITQ were given more freedom to choose how and when to catch quota instanced by the removal of closed season restriction in the orange roughy fishery.

A key aspect of the review was that harvesters could use either domestic or foreign chartered vessels to choose lowest cost harvesting techniques. The principle of the charging of resource rentals (or royalties) was also established so that the Crown enjoyed some of the benefits of a soundly managed fishery. These were set originally at \$3.00 per tonne in 1982-83 but have subsequently increased to total around \$13 million in 1986-87.

The deepwater review was important in setting the stage for a review of other fisheries, such as inshore finfisheries. From 1982 onwards, ITQs have been the principle means of managing New Zealand's fishing industry with deepwater allocations of some 227,500 tonnes compared to an inshore catch of 54,000 tonnes in 1984. Having introduced ITQs for selected deepwater species, the natural impetus was to extend them to conjoint fisheries which extended into the inshore in order to have a consistent and integrated management policy through all finfisheries.

Inshore Fishery Problems:

A feature which has characterised the introduction of new management programmes throughout the world has been the prerequisite that fishermen and fisheries need to be experiencing considerable problems before there is sufficient will to accept change by both the industry and fisheries managers. Until 1963 the inshore fishery was tightly regulated with extensive input controls restricting vessel capacity and areas fished. These created considerable distortions in investment in vessel and favoured some regions over others. In 1963 all controls were removed from the industry and open entry was allowed until 1978 in rock lobster fisheries and 1980 in finfisheries. While complete deregulation of the industry had meant that it was freed to catch more fish, by the mid to late 1970s it became increasingly apparent that several inshore stocks were under increasing biological pressure and the economic performance of the industry was also worsening. As with the deepwater fishery this led to increasing conflict between methods (such as between trawlers and longliners) to retain access to diminishing resources. Fisheries managers had to make sometimes arbitrary allocation decisions. More positively, however, it led to pressure from the industry itself for restructuring of the industry, reduced catches and greater efficiency in order to retain international competitiveness. This leadership by the industry itself was important in providing initiative for management changes.

Pre 1963 experience, remembered by many regulators and fishermen, also predisposed many people against going down the track of increasingly extensive input controls.

Economic Policy:

With the change of government in 1984, economic efficiency objectives became more focused. The attention of government was drawn to fishing as a rapidly developing industry which by 1985 accounted for 5% of New Zealand's export revenue (\$540 million which represented 80% of the industry's output). There was therefore an apparent desire by government to introduce management policies which would safeguard the export dependent fishing industry's international competitiveness by promoting economic efficiency. This naturally led to an attraction to greater use of output controls and removal of limited entry to enable efficient operators to compete for available resources.

The policy of relaxed entry to the industry is still viewed with suspicion by many in an industry accustomed to significant restrictions on entry. They fear the domination of the catching sector by powerful onshore processors who may compete for quota in order to secure access to raw material. In such circumstances they fear that a lack of competition for fish will drive down port prices paid to independent fishermen.

In recognising these concerns, government has prohibited the ownership or beneficial interest in more than 20% of total quota allocated in any area (the upper limit is 35% for the more capital intensive deep-water fishery).

Major Elements of Management Policy

These factors influenced the outcome of a major review of inshore fisheries in 1984. The objectives and elements of this policy review were:

Objectives:

- Greater economic efficiency.
- Greater flexibility for the industry to adjust to new economic circumstances.
- Less government influenced and more market determined allocations of fishing rights.
- The harvesting of resources within safe biological yields.
- The nation as a whole enjoying benefits from well managed fisheries.
- Social objectives to minimise adjustment costs of a transition to the new management programme.

The major elements of the new management policy designed to achieve these objectives were :

- The extension of ITQs to inshore finfisheries from 1 October 1986 and consultation with fishers in other fisheries on their extension to nonfinfish fisheries.
- Initial allocation of ITQs on the basis of catch histories with quotas being in perpetuity.
- Future allocation of quota by tender.
- The charging of resource rentals on all fisheries products harvested.
- An adjustment assistance scheme for inshore finfisheries which require reduced catches.
- Non aggregation limits and controls on foreign ownership of quota.

Problems with the Use of ITQs

Problems which will be encountered in managing fisheries through ITQs have been addressed. Amongst these are:

- Quota busting; where enforcement is inadequate and fishermen flaunt quota landings restrictions.
- Higrading; where lower quality fish is discarded at sea.
- By-catch; where one species is caught as an inevitable, but fluc-

tuating, proportion of the catch of a target species.

- Information costs to fishermen and managers in adjusting quotas and managing 'portfolios' of quota to match catch composition.

It was concern over some of these elements which led to some opposition to the introduction of ITQs by inshore fishermen. Some comments on each of these problems is therefore appropriate if an objective appraisal of the new management programme is to be made.

Quota Busting:

The problem of quota busting is being minimised by implementing a comprehensive monitoring system and the drafting of legislation in order to provide clear backing for penalties and definition of infringements. There is strong support within the industry for rigorous enforcement and severe penalties for transgressors in order to maintain the integrity of the management programme. The 'smallness' and geographical isolation of New Zealand, the export orientation of the industry and the record keeping requirements of GST will greatly assist in the auditing of landings. The commercial fishing fleet is confined to some 1,600 vessels which also makes it more amenable to output controls than overseas fleets which number in the several thousand. Reducing fleet capacity to better match available resources through a quota buyback scheme will also reduce pressure for quota busting.

Higrading:

This problem is likely to be a short term transitional problem and should reduce once fisheries recover and product value differentials within the same stock diminish in comparison to costs of dumping. The costs of dumping are significant and in the end fisheries managers rely on the fact that fishers go to sea to land fish, not dump it. Various gear restrictions such as minimum mesh and area restrictions will also apply in order to minimise this problem.

Stable stocks not too easily taken will assist in this regard and Total Allowable Catches (TACs) set too low will promote dumping.

To some extent, however, dumping of fish at sea is unavoidable. When ITQs were introduced in Iceland, the dumping of fish received considerable publicity. Nevertheless, an analysis by an Icelandic fisheries economist estimated that the cost of fish dumped represented only about 5% of the extra economic rent generated by the management programme (Arnason 1986).

By-Catch:

This problem is more acute where the by-catch is also a valuable species. Though this problem is almost impossible to eliminate under any fisheries management programme, a combination of the procedures below are designed to minimise it:

- the effective management and limitation of target species of which by-catch species form a component.
- the allocation of quotas based on catch history modified by fishers own voluntary choices as to how these can be amended through quota buy-back.

- a flexible and easily accessible quota trading mechanism where information costs are low to facilitate trading to adjust positions (an electronic easily accessible quota trading exchange is proposed).
- an allowance for some 'over' and 'under' runs of catch against quota each year.
- the placing on onboard observers on vessels.

Even when the total quota of a stock has been reached it is permissible to land catch taken in excess of quota where this is taken as an inevitable consequence of taking a target species, although the catch is then the property of the crown. In effect the crown is charging the fisher a price for quota equivalent to the port price for the stock. Fishers correctly point out that they are unlikely to incur the costs of holding product and bringing it ashore only to have it become crown property. An alternative, more workable way of dealing with the problem is for the crown to explicitly become the 'seller of quota of last resort' and charge a premium of quota somewhat less than the port price. Once caught, therefore, fishers would have the incentive to bring fish caught ashore but insufficient incentive to target fish for it. The high and increasing marginal cost of catching such by-catch would therefore act in a similar manner to an output tax to constrain effort on the stock. It will therefore not be necessary to get the marginal price exactly 'right' before some effort on by-catch species starts to be choked off.

In conclusion there is full awareness of the problems of management of a multispecies resource using ITQs. Nevertheless, with appropriate flexibility in management it is believed that these problems can be reduced to acceptable levels, although never eliminated. Moreover, many of the problems alluded to are also experienced with any active management policy, including reliance on input controls (such as limitations on by-catch for instance).

While sharing many of the disadvantages of ITQs, the alternative of relying solely on input controls was seen as not conferring some of the advantages of ITQ management in the circumstances faced by New Zealand fisheries managers.

Distributional Aspects of the New Management Strategies

Agreement on policies to improve economic efficiency is often easier to reach than policy on how the extra benefits created are to be distributed. The distribution of economic benefits is raised in the consideration of many aspects of the policy such as resource rentals, allocation of quota, social costs and adjustment assistance.

Resource Rentals:

As already noted, payments of resource rentals increased from a few hundred thousand dollars in 1983-84 to a total of around \$13 million in 1986-87. Almost all of this total comprises payment of rentals from the deepwater sector and increases in rentals from inshore quota will increase this total significantly in the future.

The principle of the payment of resource rentals was introduced by the last government in recognition of the generation of economic rent

by state supported management programmes to restrict output and indirectly, investment. By creating ITQs, government is creating a harvesting right similar to lease in perpetuity. The industry itself agrees with the principle of paying resource rentals, although only where fishers have a right which they are able to alienate. The payment of rentals is also not linked to any particular management strategy such as ITQs. The rock lobster fishery is currently managed by limited entry yet a rental will be payable from 1 August of \$275 per tonne of catch.

The conflict between industry and government has basically turned on a conflict of interest with Government apparently seeking to maximise its share of the economic surplus generated and industry seeking the opposite. It is likely that some windfall gain will accrue to those initially receiving quota at no cost although its extent will be hard to measure. This is because the value of vessels transferred in the past sometimes incorporated an element of capitalised surplus which existing fishers have already paid. Other reasons why government is unlikely to reap the entire economic surplus will be simply the difficulty in setting rentals to reduce traded value of quota to near zero. Quota is thus likely to attract a longterm value.

Nevertheless, the intention by government to tender increases in TACs and the likelihood that such increases in the future may be substantial, indicate that a significant proportion of the economic surplus of the fishery will accrue to the State.

The Allocation of Quota and 'New Zealandisation':

Domestic inshore fishermen are being allocated quota on the basis of historical catch. Given the considerable stress placed by the industry in seeking a fair initial 'sharing out' of quotas the allocation problem has been far more difficult to resolve than was first planned. It was the length of time taken in hearing and settling objections to catch histories upon which ITQs would be based which resulted in the 12 month delay in implementing ITQs for inshore fin fisheries.

Future allocations of quota, where TACs are increased for instance, will be by competitive tender. A competitive tender is where the marginal, lowest bid accepted determines the price for quota that all successful tenderers pay.

The issue of 'New Zealandisation' or preference for domestically owned and crewed vessels in gaining access to deepwater resources is currently a contentious issue within the industry. Currently, successful tenders for increased deepwater quota, for instance, can use either domestic or foreign charter vessels to take their quota. This makes the boundary between the use of domestic and foreign factors to catch fish extremely transparent. Operators of domestic vessels rightly claim that the cost excesses on fuel and other intermediate inputs prejudice their ability to compete for increased quota. They also argue for some additional preference for New Zealand factors based on infant industry arguments and also the premise that a uniform, low rate of protection or assistance across all sectors is an apparent Government objective.

Some preference for catching fish with New Zealand vessels is given through a lower rental payable on quota caught by domestic vessels

(half that for foreign charter vessels). This differential, however, does not compensate for all the cost excesses paid by the domestic industry. There is therefore increasing pressure from the industry for the specific allocation of some quota which is restricted solely to domestic vessels, thus moving away significantly from present policy allowing free choice between domestic and foreign flag vessels. This option is less preferable than the use of a differential rental and a direct attack on the root causes of the cost excesses industry faces (such as Marsden Point expansion costs in diesel prices). A differential rental provides an equivalent of 'tariff' or price advantage assistance to domestic harvesters when they compete for resources by tender. Restricting quota specifically for catching by domestic vessels is, on the other hand, equivalent to 'import licence' type protection by conferring an absolute advantage to domestic harvesters. Such a policy runs the risk of making the same mistake as US fishery development policy which is forcing the 'Americanisation' of its deep-water fishery regardless of the long term international competitiveness of harvesting with US owned and crewed vessels. 'New Zealandisation' under similar circumstances where domestic harvesters are uncompetitive could in fact reduce rather than increase national income.

The frustration of domestic harvesters is that they would be competitive if freed from cost excesses and given the same market access advantages of foreign flag vessel operators. Their desire for quantitative 'tagging' of quota restricted for local vessels stems from the belief that the root cause of cost excesses will not be eliminated.

Regional and Social Implications:

Because quotas are freely transferable, it is most likely that catch will be concentrated in areas and methods which can harvest most efficiently. Regions which do not have a comparative advantage in either servicing infrastructure or distance to fishing grounds or export ports could thus be deprived of quota. This problem is a result of 'transferability' of fishing rights and is not linked directly to ITQs alone. It is exacerbated by the significant reduction in inshore catches of species upon which small fishing communities are dependent. Examples of such communities are several small towns in Northland reliant on the snapper fishery.

These likely social impacts are presently the subject of considerable debate although practical means of minimising adjustment 'pain' to some regions are difficult to devise. To minimise these costs would require restricting transferability in some way or the targeting of specific subsidies to communities to enable them to compete for quota.

Adjustment Assistance:

Adjustment assistance is being provided to fishers who reduce their catch of inshore species or remove themselves from the inshore fishery completely. This will involve the 'de-facto' purchasing back of provisional quotas initially allocated to fishers to match fishing effort to available catch. Fishers will voluntarily offer back to Government all, or portion of, their provisional quotas by placing a value on a 'basket' or combination of species tonnages.

The buyback is to be conducted on a competitive rather than discriminatory basis where marginal bids will determine tender prices. This

will encourage tenders to bid the true opportunity cost of foregone catch. If their bid is below the marginal value of the fish stocks they are offering up, they will not be penalised. Successful tenderers will receive as near as possible the same price as each other for the same units of fish stocks. The total each will receive will be at least what they bid, and except for a few, more than they bid.

Those reducing their inshore catch and laying off crew have the option of making payments to share crew made redundant. Government and the Fishing Industry Board are strongly urging the payment of redundancy in order to minimise adjustment costs to crew as well as vessel owners.

Conclusion

The success of the new management strategies can thus far only be assessed in the deepwater trawl fishery which has been subject to ITQs since 1982. Profitability in this fishery improved substantially following the introduction of ITQs attributable principally to increases in export prices of deepwater species such as orange roughy. Nevertheless, deepwater quota holders have also attested to the role of ITQs in providing efficiency gains and also in assisting to maintain levels of profitability. Premiums on longterm contracts of supply have been possible because of security of access and production planning which is therefore possible. An obvious benefit to government from the policy is the payment of some \$13 million in resource rentals this financial year and the prospect of this increasing significantly over the next few years.

The more diverse nature of the inshore finfishery makes it more difficult to manage and the economic success of the introduction of ITQs may therefore be less, although still significant. In order to simplify administration the number of species presently managed separately under ITQs may be reviewed, with some amalgamation of species and areas. Presently 13 species are managed by ITQs and this will be extended to 27 from 1 October 1986. Some other refinements to the administration of ITQs are likely, such as in the administration of by-catch for instance.

Some increase in export prices is also likely due to the reductions in the availability of some prime inshore stocks.

In general, the fishing industry has a good longterm outlook with a projected future strong market demand for fish and relatively few trade barriers. Given the likelihood that New Zealand will have a comparative advantage in implementing management strategies which promote efficiency, the longterm international competitiveness of the NZ fishing industry is assured, despite short term adjustment and exchange rate problems.

R E F E R E N C E S

Arnason Ragnar, Pers Comm 1986.

TRADE BARRIERS AND INTERNATIONAL TRADE IN FOREST PRODUCTS

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SUMMARY

Tariff levels on most forest products have been reduced to low levels. For individual products, however, such as panel products (particularly plywood), manufactured wood products, some paper and paperboards, and furniture, rates are still high in some markets. As tariffs have declined non-tariff barriers (NTBs) have become more important. Export barriers such as log bans and export taxes are having important effects on forest product trade patterns. As New Zealand's wood supply expands, increasing volumes of forest products will be exported. Unless these exports are of unprocessed products, trade barriers will become an increasing restriction. Every effort must be made to reduce or overcome these barriers.

Key Words: Trade barriers, Tariffs, Non-tariff barriers, Forest products

PROTECTIONISM OF GROWING CONCERN

Increasing concern at the extent and nature of protectionist policies of the major countries engaged in international trade has been voiced by international agencies such as the World Bank, International Monetary Fund (IMF), United Nations Conference on Trade & Development (UNCTAD), The General Agreement on Tariffs & Trade (GATT) and the Food & Agricultural Organisation of the United Nations (FAO). These bodies have highlighted the detrimental effects on world economic activity, and in particular the impacts on the developing countries.

Individual countries have complained of the barriers facing their exports while still maintaining or raising barriers to protect their own domestic producers. For example the European Economic Community's (EEC) protectionist policies have grown while calls for greater freedom have been expressed by individual member countries; the USA has applied increasing pressure for the liberalisation of Japanese restrictions while at the same time tightening barriers affecting developing countries and threatening moves against Canada.

In the post-war period GATT was developed to provide a framework of rules and guidelines within which world trade could operate. Until the most recent round of multilateral negotiations, known as the Tokyo Round, the main emphasis was on reducing tariff barriers. The Tokyo Round, which concluded in 1979, continued this emphasis on tariff reductions but also made efforts to address the problem of non-tariff barriers.

Despite the degree of success achieved in bringing tariff levels down, and limited moves on other barriers, protectionism in its various forms is still considered to be one of the major problems affecting international trade. In its 1984 Annual Report the IMF stated that "Among the most troubling developments of recent years has been the strengthening of protectionist tendencies" (IMF, 1984). This is especially true of the situation facing developing countries whose opportunities for expanding exports are often much more limited than those of the more developed countries.

With increasing moves towards greater protectionism, particularly because of economic pressures resulting from the depressed state of the world economy, support is growing for a new round of GATT multilateral trade negotiations. Discussions are already underway aimed at agreeing on the terms and conditions which would define the issues to be included in any negotiations. The New Zealand Government has established a committee to prepare a strategy for the new round of negotiations. Present indications are that any round of negotiations might not commence before 1987 at the earliest.

TARIFF BARRIERS

Previous negotiations achieved some success in reducing average tariff levels. Greatest gains came for manufactured products, with tariffs currently averaging around 5%, down from around 40% in the 1930s. Although in some cases being reduced, rates facing agricultural products have been more difficult to negotiate.

Although average tariff rates for all products have been reduced to low levels for a large part of world trade, levels still remain quite high for a wide range of products in particular markets. The variability that exists between markets and between major product groups is highlighted in table 1 which shows that average rates for forest products are relatively low. However, this level of aggregation masks the problem facing specific products. Unprocessed wood products such as logs, squares or rough-sawn timber in most developed market economies (DMECs) face low tariffs. Semi-processed forms such as veneers, fibreboards and dressed timber generally face higher rates. More highly processed forms such as plywood, some reconstituted panels, and furniture usually face the highest tariffs.

This tendency known as tariff escalation makes it more difficult for exporters to trade in more processed products. In turn this denies the exporting country the benefits of added-value. This problem is considered of particular importance to the developing countries which are searching for basic processing activities which can provide them with the benefits of the added-value activities. Paper and paper products which require much more capital intensive, sophisticated processing technologies do not show the same clear-cut evidence of tariff escalation. Basic products, such as wood chips and pulp have zero or low tariffs, while paper and paperboard products usually have higher but still relatively low rates.

Looking at specific examples, table 2 indicates tariff levels for Japan, Australia, the EEC and the USA for selected forest products. A number of points are apparent. Tariffs on unprocessed products are zero or negligible. Rates on timber tend to be somewhat higher and in some instances vary with size, wood species and degree of finishing. Levels also vary between countries. For example Japanese rates on sawn timber are 10% for the main hardwood species, 7% for spruce, pine and fir softwoods, but 0% for other species. Thus Douglas fir¹, which is an important North American species, and some other species enter free of duty, while New Zealand radiata pine faces a 7% duty. Customs schedule differences

¹ Douglas Fir is not a true fir and is hence not categorised with spruce, pine, fir.

Table 1: Average Tariff Rates on Exports from all Sources to the Developed Market Economy Countries: Major Product Groups*

CCCN Tariff Category		USA	EEC	Eight Other Markets
		Average Tariff	Average Tariff	Average Tariff
		Post- MTN	Post MTN	Post- MTN
		(%)	(%)	(%)
I.	Live animals	2.0	7.6	7.1
II.	Vegetable products	1.0	3.8	6.0
III.	Animals and vegetable fats and oils	0.9	2.7	3.5
IV.	Prepared foodstuffs	4.5	4.2	39.2
V.	Mineral products	0.7	0.3	1.5
VI.	Chemical products	3.3	3.5	3.6
VII.	Artificial resins and plastics	3.0	3.7	7.2
VIII.	Raw hides and skins	7.2	1.7	5.9
IX.	Wood and wood articles	1.9	1.0	0.9
X.	Paper and paperboard	0.2	4.2	4.8
XI.	Textiles and textile articles	14.7	5.6	11.9
XII.	Footwear, headgear, umbrellas, etc.	12.2	6.6	16.2
XIII.	Articles of stone or plaster	8.2	3.8	6.3
XIV.	Pearls and precious stones	1.0	0.1	1.2
XV.	Articles of base metal	3.1	2.1	4.6
XVI.	Machinery and appliances	3.2	4.4	5.2
XVII.	Vehicles and aircraft	2.9	4.6	4.1
XVIII.	Optical goods	5.1	4.5	4.6
XIX.	Arms and ammunition	3.2	4.3	5.8
XX.	Miscellaneous articles	3.9	4.2	8.9
I-XXI	All items	2.9	2.4	5.3

Source: Olechowski & Yeats (1982)

* Average tariff rate applying when phased reduction of tariffs are completed.

MTN - Tokyo Round of Multilateral Trade Negotiations

Table 2: Most Favoured Nation (MFN) Tariff Levels for Selected Forest Products: Australia, EEC, Japan, USA (as at December 1985)

CCCN Tariff No.	General Product Description	Tariff Rate (%)			
		Australia	EEC	Japan	USA
44.03	Wood in rough	0	0	0	0
44.05	Wood simply sawn	5(0)	0,4.1(0)	0,7,10(0,5)*	0
44.09	Wood chips	5(0)	0	0	0
44.13	Wood planed, grooved etc.	0-15(0,--)	0,4.3(0)*	0,10(0)	0,2.5(0)*
44.14	Veneer	5(--)	6.1(0)*	15(0,7.5)*	0
44.15	Plywood Laminated lumber	28(--) 15	10.4*(0)* 11.1	15,17,20(--) 20	3.6-20(0,--) 1.9c/lb. + 3.4%
44.19 to 44.28	Manufactured wood products	15(0)	2.6-9.1(0)*	2.5-7.2(0)*	0-8(0)
94.01 94.03	Furniture	30(20)*	5.6,6.3(0)*	4.8(0)*	2.8-5.8(0)*
47.01	Wood pulp	2,15(0)	0	0	0
48.01 to 48.15	Newsprint Other paper and paperboard	0 0-30(0)	5.4*(0)* 4.1-12.8	3.9(0) 5-12(0)	0 0-3.3(0)

Notes: These are MFN rates. Special preferences may be available for specified products and supplying countries. Those for the Generalised System of Preferences (GSP) are shown in brackets. MFN rates on some products will reduce by stages until 1987.

* Non-tariff barriers place limitations on rates shown.

-- No GSP

Sources: National tariff schedules; official documents.

of this nature result in different import sources being affected differently.

More processed products such as laminated timber, planed, tongued and grooved timber and veneer have rates ranging from 0-15%, while rates on plywood, beadings, mouldings, carpentry and furniture can be as high as 30%. Paper and paperboard tariffs vary considerably depending on the specific category. Newsprint, for example, is free of duty in the USA, compared to 5.4% in the EEC²; other types of paper and paperboard have tariffs ranging from 0% to 30%.

Special preferences can reduce the duties that exporters must face. In particular a Generalised System of Preferences (GSP) scheme was negotiated under UNCTAD. This provides lower duty rates for developing country exporters, and has resulted in many products from these countries entering the DMEC markets free of duty. Although of considerable benefit to developing countries, the full potential of the GSP is not realised for a number of reasons. GSP preferences are not bound levels and can be withdrawn. Also each importing country determines whether or not it is willing to offer these preferences, the countries the preferences will apply to, which products are eligible, and the period they apply for. Additionally, many GSP allowances are subject to various limitations (e.g. quotas, market share criteria). Of importance to developing countries exporting forest products is the fact that products such as panels and manufactured wood products are often excluded from the GSP schemes, or subject to these limitations (UNCTAD, 1979).

These and other preferences are of considerable benefit to those eligible to receive them. The GSP scheme is of benefit to developing countries, but in turn places developed country exporters such as New Zealand at a disadvantage in some important markets. Of special relevance to New Zealand is the fact that important developing country exporters of softwoods are provided with an advantage in markets such as Japan, the EEC, and North America. Chile and to a lesser degree Fiji are developing countries with rapidly expanding softwood resources which have such tariff advantages. In Japan, for example, Chilean sawn radiata pine has a 7% tariff advantage over New Zealand.

The situation is however variable. Although Chile has this advantage in a number of countries, in Australia, New Zealand's main export market, neither has a tariff advantage since New Zealand forest products enter duty free under the Closer Economic Relations (CER) agreement.

NON-TARIFF BARRIERS (NTBs)

Non-tariff measures used for protective purposes are wide-ranging. They include direct quantitative controls such as quotas, tariff quotas or voluntary export restraints; less direct controls such as import authorisations (licenses, permits etc) which may be automatic or at the discretion of customs authorities; price level controls such as minimum prices, price investigations, variable levies, and countervailing duties; and health and technical standards which may be liberal or highly restrictive in their interpretation. In addition, customs formalities,

² A tariff-quota allows much of the newsprint traded to enter duty free, however.

import deposits, government trading policies and marking and packaging requirements can also act as NTBs depending on their application. Even more difficult to categorise are internal subsidies which many classify as NTBs.

Volume controls are the most common measures used to restrict trade. UNCTAD (1985) estimates for 1984 that in 17 DMECs about 24% of imports by value are subject to volume controls³. Of this broad group, 11% of trade is controlled by quantitative restrictions such as quotas, and 14% by volume surveillance measures. By contrast only 2.6% is subject to price level controls and only 1.3% to tariff-like measures (such as tariff-quotas, other duties etc). In all instances agricultural products are much more subject to controls than industrial products⁴. A further feature highlighted by the UNCTAD study is that imports into the DMECs from developing countries and socialist countries in Eastern Europe and Asia are more subject to NTBs than those from other DMECs.

Forest products are less affected by NTBs than most other products. Quantitative restrictions, price controls and other forms of NTBs are not widespread. In particular voluntary export restraints, which are becoming an increasing problem for many other products, are uncommon but not unknown for forest products.

Other NTBs which create considerable problems for some forest products do however exist. A number of products entering Japan and the EEC are subject to tariff-quota limitations. Newsprint and plywood into the EEC are controlled in this manner as are a number of wood products entering Japan under GSP tariff preferences (GATT, 1983).

Health and technical standards and import authorisations often act as NTBs. Their operation is difficult to assess because the distinction between those used for legitimate health and safety reasons and those being primarily used for trade control is often unclear. Disputes between exporting and importing countries on the reasonableness of individual standards indicate the diversity of opinion that can exist. In fact GATT (1984) reports that standards are most often cited by exporting countries as barriers to exports. Disagreement between USA exporters and Japan over tolerance levels in softwood plywood for "white pocket", a fungal disease of Douglas Fir, and technical difficulties over the use of plywood for construction purposes are examples of the disagreement that can arise. For many years New Zealand sought a revision of Japanese technical standards which classified radiata pine as being inferior in strength and quality because of its ring width. Most radiata was ruled as unacceptable for building purposes under this regulation. An extended period of testing and negotiation was necessary before the Japanese agreed to modify this regulation in 1981. Import permits and licensing are a further case in point. The manner in which they are administered and whether or not they are used as trade barriers is often difficult to determine.

³ The seventeen countries studied were Austria, Australia, EEC (10), Finland, Japan, Norway, Sweden and the USA.

⁴ Agricultural products comprise CCCN categories 0101-2402. All forestry products which fall in category 44-48, and 94 are therefore included in the industrial products category.

Although subject to considerable uncertainty, estimates for 17 DMECs suggest that for 1984 nearly 19% of their wood and wood products imports were affected by NTBs. By comparison the figure for all imports was 27% and for all industrial imports 16% (UNIDO, 1983). Of note is the fact that the average for wood and wood products is heavily influenced by high levels for the EEC (particularly France) and the USA - although most of the 17 countries analysed are in the range 12% to 20%, the estimates for the USA and France are 84% and 90% respectively. Further, only a limited range of barriers are involved - anti-dumping investigations in the case of the USA; and anti-dumping investigations together with discretionary licensing and tariff-quotas in the case of France.

Anti-dumping investigations may be used to restrict imports. Considerable uncertainty is introduced into exports, temporary duties may be applied and costs incurred in defending the accusations. Many investigations appear to be used to create access difficulties rather than because a legitimate case exists. The use of these appears to be growing, although mainly restricted to a small number of developed countries which have formal legal provisions and procedures and which have an administrative structure for enforcement. The EEC, the USA and Australia have all made use of these procedures. A recent example was a USA investigation on softwood lumber imports from Canada. In 1982, investigations regarding the subsidisation of certain softwood lumber products from Canada were carried out to determine whether Canadian producers were causing harm to the US industry because of domestic subsidies. In mid 1983 the International Trade Administration of the Department of Commerce ruled against the US petitioners, the US Coalition for Fair Canadian Lumber Imports (a group of producers of US softwood lumber products). The same issue again surfaced in 1984 with renewed attempts to limit Canadian imports.

New Zealand sawn timber exports faced similar opposition from Australian producers. A complaint of dumping was laid by Australian producers in 1982 and was only finally resolved in 1985. During that period extensive industry-to-industry negotiations and legal battles in the Australian courts were involved, culminating in New Zealand exporters agreeing to voluntary restraints. These involved observing minimum export prices based on 'normal' values set by the Australian Customs Service, and limiting the monthly volume of shipments of structural grade timber. The restraints were in place for about two years before Government to Government negotiations and improved market conditions allowed them to be removed. This highlights the degree of 'enforcement' involved in many so-called 'voluntary' agreements, and the role Governments may play in the process.

Developing countries also use tariffs and NTBs to influence imports. Tariff rates are generally substantially higher than those imposed by the DMECs, with rates in many South East Asian countries being in the range 20-40% (table 3). In the case of NTBs, developing countries tend to resort to their use even more frequently than the DMECs. This is due to their need to closely control foreign exchange flows and the heavy involvement of governments in managing the economy. Global volume controls are the most widely used measures, particularly monitoring measures, quotas and discretionary licensing (UNCTAD, 1985). For wood and wood products the most common NTBs are monitoring measures (26.4% of product groups affected), other quantitative restrictions (such as quotas and discretionary licensing (22.3%), and total prohibition (8.8%) (UNIDO, 1983).

TABLE 3: Tariff Rates - Selected Developing Countries in Asia-Pacific Region
(%A Valorem)

	Singapore	Malaysia	Philippines ¹	Indonesia	Korea	Papua-New Guinea ³
44.03 Wood in rough						
- pulpwood	0	20	10	15	5	17.5
- saw and veneer logs	0	20	10	15	5(C) 5-20(NC)	17.5
44.04 Wood roughly squared	0	20	10	15	5(C) 5-20(NC)	17.5
44.05 Wood sawn lengthwise sliced or peeled	0	20	20	15	20(C) 20(NC)	17.5
44.09 Chips and particles	0	25	20	15	5	
44.11 Fibre building boards	0	25	30	30	20	15
44.13 Wood planed, tongued etc.	0	25	30	30	20	17.5
44.14 Veneer	0	25	30	20(C) 10-20(NC)	20(C) 10-20(NC)	15
44.15 Plywood	0	0,45	40	30	30	15
44.18 Reconstit. boards	0	25	40	30		15
- Particleboard					20*	10
- Other					20	
44.19 Wood bearings mouldings etc	0	25	50	30	30	17.5
44.23 Builders carpentry, joinery	0	25	50	30	40	17.5
47.01 Wood pulp	0	3	10,20	5	10	
47.02 Waste paper	0	\$29.53/t	10	40	5 ²	
48.01 Paper & paperboard						
- Newsprint	0	5	30	5	40	10
- Printing	0	0	30	30		20
- Kraft	0	5	50	30		0
48.05 Corr. paper & board etc.	0	20	40	30	40	0
94.01, 94.03 Furniture	5	55,60	50	50	50	30

Source: Country tariff schedules; GATT Document TD/W/345 & addendums; Bulletin International des Douanes.
Prepared Feb. 1986.

Notes: Members of the ASEAN group (Indonesia, Malaysia, Philippines, Singapore and Thailand) grant special rates to other members. For example Malaysia gives 20% exemption from import duty on products in Categories 44 and 94, and full exemption for many items in 47.

C - coniferous NC = non-coniferous

* In April 1985 temporary reduction to 20% on imports up to 100,000 m³ entering before Jan. 1986.
Unless extended, the rate then reverts to 30%.

¹ Duty assessed on FOB value plus 10%

² Temporary rate. Bound GATT rates are higher

³ Surcharge of 3.5% also applies

An interesting difference between the developing and developed countries is the fact that in the latter NTBs are most common for primary wood products, while in the developing countries imports of secondary wood products face the highest barriers (Olechowski, 1985).

EXPORT RESTRICTIONS

Import restrictions are the best known and most widespread form of trade control. Export restrictions however, are currently of major significance to trade in forest products. A number of countries have used such controls for many years in an effort to encourage a move from the export of logs or roughly squared timber to the export of more highly processed forms. Both Canada and the USA have formal restrictions which have been in place for many years, but recent moves by South-East Asian exporting countries have the potential to have major impacts on trade patterns. Although Indonesia, Malaysia and the Philippines have used export controls since the mid-1970s, in the past the commitment of the governments and industry has been sporadic. In the last few years however these policies have been tightened, with Indonesia in particular moving rapidly towards elimination of the export of logs. Current policies in that country have turned it from a major exporter of tropical logs to the world's largest exporter of plywood (FAO, 1985). Similar export restrictions are used by some African countries, while most South American countries introduced log export bans in the early 1970s which remain in force to date. By contrast Chile removed its log export restrictions in 1975 and now encourages their export. The New Zealand Forest Service, which controls nearly 50% of the country's exotic forest production, maintains a policy of limiting the export of logs.

The main restrictions used are export duties which are higher on unprocessed than on processed products, and quotas or complete bans on unprocessed products.

One objective of export restrictions is to 'force' a greater degree of the value-added activity to take place in the exporting country. Indonesia, the Philippines and Malaysia are attempting to take over much of the processing carried out in end-use markets such as Japan, and in-transit processing countries such as South Korea, Taiwan and Singapore.

In developing countries these export restrictions have two main goals - to raise revenue for the government, and to compensate for high import barriers facing processed product forms. Developed countries have less interest in the revenue raising effects than in achieving greater processing. Exporters however face difficulties at least in the short-term. There may be a substantial decline in foreign exchange earnings during the change to processed product exports, and competitive difficulties may arise since a comparative advantage in growing trees does not necessarily mean an advantage in processing them. Studies on the effectiveness of USA log export controls suggest that such restrictions may not in fact be particularly effective in promoting a larger domestic processing industry (Sedjo & Wiseman, 1983). A number of factors can influence their effectiveness, including the degree to which the importing country can find alternative sources of logs, the extent to which the exporting country can produce an acceptable quality product at a competitive price, and the presence or absence of substitute materials (for example softwood logs as a substitute for hardwood logs).

EXPANDED TRADE THROUGH THE REMOVAL OF BARRIERS

Assessing the impact of trade barriers is a difficult task. This is especially true for NTBs, particularly the less-quantitative barriers such as standards and anti-dumping investigations which do not result in the imposition of duties or price controls but do nevertheless restrict trade. Uncertainty regarding treatment of products can have an unsettling effect on exporters, and the increased risk can result in less trade than would otherwise occur. The fact that more than one type of barrier exists on most products means that the total impact is greater than might otherwise appear to be the case.

Attempts at quantitatively assessing the effects of removing trade barriers have been made for some forest products in the main developed country markets. It has been estimated that the complete removal of all tariffs facing wood and wood products would generate over \$700 million new trade between the developed countries, and an additional \$150 million new exports for developing countries (UNIDO, 1983)⁵. Another study (UNCTAD, 1985) suggested that the selective removal of all tariffs on imports from developing countries by the EEC, Japan and the USA, and the removal of the main NTBs, would result in increased trade for selected forest products. The increase would range from an additional 0.2% (over 1980 trade levels) for sulphate wood pulp, to 60% for furniture, (table 4). In monetary terms the value of trade created would range from \$5.5 million for pulp to \$1030 million for furniture⁶.

Although only approximate, the figures do suggest that substantial increases in trade may be possible from dismantling or removing many of the barriers facing forest products.

TRADE BARRIERS AND NEW ZEALAND EXPORTS

Forest product exports were valued at NZ\$766 million in 1985. Two markets, Australia and Japan, accounted for 68% of total exports, with Australia accounting for 44%. Major exports and destinations are shown in table 5. Exports to Australia are mainly processed products such as sawntimber, paper and paper products, and wood manufactures. Pulp exports are the only relatively unprocessed product of consequence. Those to Japan on the other hand are unprocessed products, mainly pulp, wood chips, logs and flitches⁷. In total about 42% of New Zealand's exports (by value) can be broadly categorised as unprocessed.

⁵ Unless noted otherwise all values are \$US

⁶ The estimates were developed using a partial equilibrium trade model developed by UNCTAD

⁷ Flitches are classified for statistical purposes as sawn timber but are essentially squared logs.

TABLE 4 - Potential Trade Increases From the Removal of Barriers Facing Developing Countries in the USA, EEC and Japan(a)

SITC Category	Product	Increased Trade(b)	
		%	Value (\$m)
2433	Sawn lumber, planed grooved, non-coniferous	0.6	28.6
2517	Sulphate wood pulp	0.2	5.5
6312	Plywood	11.2	96.0
6412	Other printing paper	7.5	592.3
8210	Furniture	59.5	1030.0

Source: UNCTAD, 1985

(a) Complete removal of tariffs and elimination of some non-tariff barriers.

(b) Over 1980 trade levels.

New Zealand's exotic wood supply is projected to expand dramatically from the current 9 million m³ to about 20 million m³ by the year 2000. With domestic consumption likely to increase only slowly, wood available for export will quadruple to about 12 million m³. This implies an expansion of existing markets and the development of new markets. Any significant growth in exports to Australia can be ruled out because of increasing supplies of Australia's own softwood resource. The benefits of duty-free entry under CER are therefore also ruled out for future increases in exports. Unless the expanded wood supply is exported in unprocessed product form, tariff barriers and NTBs will become more important for a much greater proportion of New Zealand's exports. These barriers will add to the difficulties already faced through New Zealand's distance from potential markets in Asia, North America and Europe.

New Zealand's emphasis on growing clearwood, because of suggested markets for furniture componentry, joinery, veneers and plywood will mean that trade barriers, particularly tariffs, will be more important if the goal is to export finished or semi-finished products.

Increased emphasis on more processed products, especially those to be put to structural uses such as framing timbers, beams, sheathing, flooring etc, will mean greater difficulties involving technical standards. The poor reputation radiata holds in many markets will increase the difficulties that must be overcome in this respect.

Every effort should therefore be made to encourage a reduction in both tariff and NTBs. This should involve both effort in international negotiations such as GATT, and in bilateral discussions with countries which hold potential as markets. Individual companies, industry

TABLE 5: EXPORT OF FOREST PRODUCTS FROM NEW ZEALAND FOR THE YEAR ENDED DECEMBER 1985

(By main countries)

Country	Logs		Sawn Timber		Rulp		Paper		Panel Products		Wood Chips		Other Forest Products	Total Value
	Quantity m ³ (r)	f.o.b. Value \$000	Quantity m ³ (s)	f.o.b. Value \$000	Quantity Tonnes	f.o.b. Value \$000	Quantity Tonnes	f.o.b. Value \$000	Quantity m ³	f.o.b. Value \$000	Quantity BDU	f.o.b. Value \$000	f.o.b. Value \$000	f.o.b. Value \$000
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Australia	6,814	521	303,479	87,791	80,933	51,232	121,633	113,626	17,031	13,018	9	40	70,089	336,316
China Peoples Rep.	-	-	3	1	18,225	8,687	2,689	1,950	223	106	-	-	1	10,746
Fiji	-	-	22	13	80	77	6,708	7,259	3,602	1,567	-	1	3,447	12,365
Hong Kong	-	-	86	43	526	276	31,732	21,054	2,563	1,108	-	-	505	22,986
India	-	-	-	-	26,589	14,517	4,600	3,866	-	-	-	-	253	18,636
Indonesia	-	-	-	-	32,459	15,567	10,087	5,858	-	-	-	-	750	22,175
Japan	307,974	32,110	156,339	26,832	243,225	86,332	-	-	8,283	2,198	263,105	36,984	3,067	187,523
Korea Republic of	86,644	9,885	-	-	25,103	11,260	-	-	2,452	814	30,833	4,882	356	27,197
Malaysia	-	-	3	2	3,992	3,031	17,162	12,498	2	1	-	-	92	15,624
Philippines	-	-	-	-	6,237	3,021	3,354	2,466	-	-	-	-	435	5,921
Papua New Guinea	39	18	377	122	-	-	2,536	3,465	1,916	1,317	-	4	5,400	10,327
Singapore	-	-	2,271	758	-	-	8,021	3,969	3,646	1,702	-	-	314	6,743
Taiwan	-	-	282	93	16,507	7,928	1,343	747	13,370	4,886	7,565	1,129	76	14,860
USA	15	6	3,687	2,367	-	-	2,063	3,265	7,035	2,491	-	-	26,752	34,883
Other Countries	5,011	373	45,013	5,205	10,731	5,446	14,985	9,280	9,571	4,035	1,090	14	15,760	40,113
TOTAL														
All Countries	406,497	42,913	511,562	123,227	464,607	207,374	226,913	189,303	69,694	33,243	302,602	43,054	127,297	766,411

Notes: 1 "Sawn timber" includes sleepers and box shooks.

2 "Paper" consists of newsprint, printing and writing paper, and other paper and paperboard.

3 "Panel products" consists of plywood, veneer, particleboard and fibreboard.

4 "Other forest products" consists of all other manufactures from wood and cork, manufactures of paper and paperboard, and wastepaper.

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organisations and government all have an important role to play in establishing an environment which will encourage the reduction of barriers.

SUMMARY AND CONCLUSIONS

International trade in forest products, as in most products, is influenced and restricted by protectionist moves. Formal barriers instituted and administered by governments include both tariff and non-tariff barriers.

Tariff barriers are best known and have been addressed in a number of multi-lateral trade negotiation rounds the most recent of which, the Tokyo Round, also attempted to address NTBs. As a result of these negotiations and other moves, tariffs have generally reached low levels on a wide range of forest products. For specific forest products in individual countries, however, tariff rates are still significant. Examples include plywood, certain sawn timber products, manufactured wood products and some paper and paperboard products. Major developed countries which maintain high levels on some of these products include Japan, the EEC and Australia. Although the impact on developing countries of many of the higher tariffs is modified by special preferences, the products named above continue to be limited by additional restrictive conditions.

As tariffs have declined NTBs have tended to increase, and have become of growing concern. In many cases they are substituted for tariffs because of their variety, ease of modification to take account of changing conditions, greater certainty of effect, and their lower visibility. While this is less true than for many other products, NTBs do have a significant effect on selected forest products. Of particular note is plywood which often faces high barriers.

High tariffs, tariff escalation, and the use of NTBs which are difficult to identify, are some of the concerns which must be addressed. New Zealand efforts to increase the export of more processed products, together with the substantial increase in wood supply which will be directed towards export markets by the year 2000, suggests that tariff barriers and NTBs may become of increasing importance. Every effort must therefore be made to both reduce and overcome these barriers.

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DEALING WITH THE FINANCIAL CRISIS IN MIDWESTERN US FARMING

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Summary:

This paper will describe some causes and reactions to the farm financial crisis in U.S. Agriculture. It includes a review of interest rates, strength of the dollar, the strength of the international market, land prices and various factors that affect the farmer on the micro and macro level. A review of how the financial community and various governmental agencies are trying to assist farmers and lenders during the crisis is presented. The actions of the key players, specifically the Farmers Home Administration, the Small Business Administration, the Commodity Credit Corporation, the Cooperative Farm Credit System, and commercial banks are described. The report will conclude with a discussion of what the Land Grant University system through the Cooperative Extension Service and also what private groups are doing to alleviate the financial and personal crisis for individual farmers and agribusinessmen.

Key Words: credit, financial crisis, coping, stress

OVERALL FINANCIAL SITUATION

Luther Tweeten, Regents Professor, Department of Agricultural Economics, Oklahoma State University provides this statement about the farm financial crisis in April of 1985. He indicates "the farming industry was financially sound entering the 1980's. The late 1970's were mostly good years for farmers. On January 1, 1980, the debt-to-asset ratio was 16.3 percent for the farming industry. It ranged from 32 percent for large farms to 10 percent for the smallest farms. By January 2, 1984, the debt-to-assets ratio had risen to 21 percent for the farming industry, and ranged from 38 percent for large farms to 12 percent for the smallest farms. Although rising, these debt-to-asset ratios are low by non-farm business and industry standards." (Tweeten, 1985)

The low debt-to-asset ratio is misleading on two accounts: 1) farmers use fair market value asset valuation 2) debt is not repaid out of assets, but instead from earnings. Thus, possibly a better measure of financial health relative to other industries is debt-to-income (D/I) ratio. Here agricultural producers see a severe problem. Nineteen-fifty was the last year debt-to-income was less than 1 (D/I = .91 years).

Table 1. The U.S. Farm Sector's Balance Sheet.

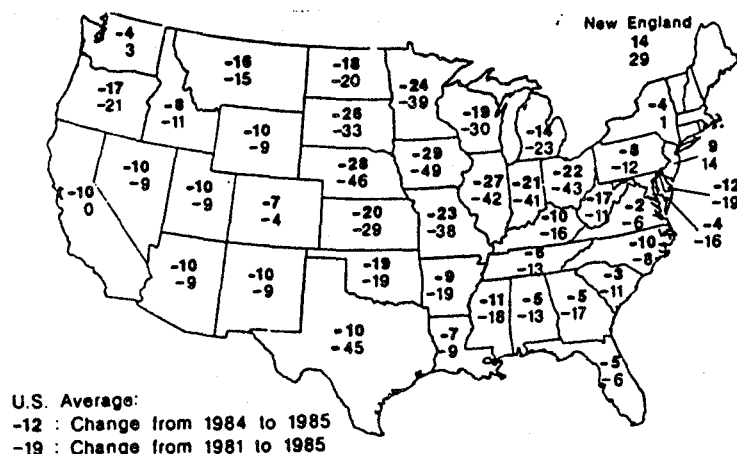
Year	Nominal Asset Value (billions)	Debt (billions)	D/A (%)	D/I (Years)
1960	\$ 210	\$ 25	12	2.15
1970	315	53	17	3.75
1975	504	82	16	4.80
1980	1005	158	16	7.95
1982	1092	202	18	10.10
1985	~ 900	215	24	~ 10

In paralleling the depressed 1980's and the "Great Depression" of the 1930's, at least one item is comparable: Real net farm income 1980-1985 with real net farm income 1930-1935. From that viewpoint, it is just as bad now as it was then. But there are some extenuating factors. First, two-thirds fewer farmers are sharing the same sized income pie, and second, off-farm income contribution to the total farm household income surpassed net farm income in 1982, a phenomena unheard of in any of the 50 prior years.

SOME MACROECONOMIC CONTRIBUTORS

Several factors and macroeconomic variables affecting agricultural producers have exposed their least favorable behaviors during the 1980's. The appreciation of the dollar since 1980 has cut into the competitive edge of domestic agriculturalists in the world market. A sharp drop in inflation has dictated that new expectations be adopted by investors and consumers alike. High real interest rates (nominal minus an inflation factor) have dealt highly leveraged farmers a critical blow. Interest expense, as a percent of total expenses in farming, has grown from 3 percent in 1978 to near 15 percent currently. The net result of this triad combination - an appreciated dollar, wringing out inflationary expectations and high real interest rates - has had the ultimate effect of deteriorating agricultural land values as much as 60% in some locales. A closer examination of these three factors will help in seeing the links between global economic forces and the U.S. farmers major asset, real estate.

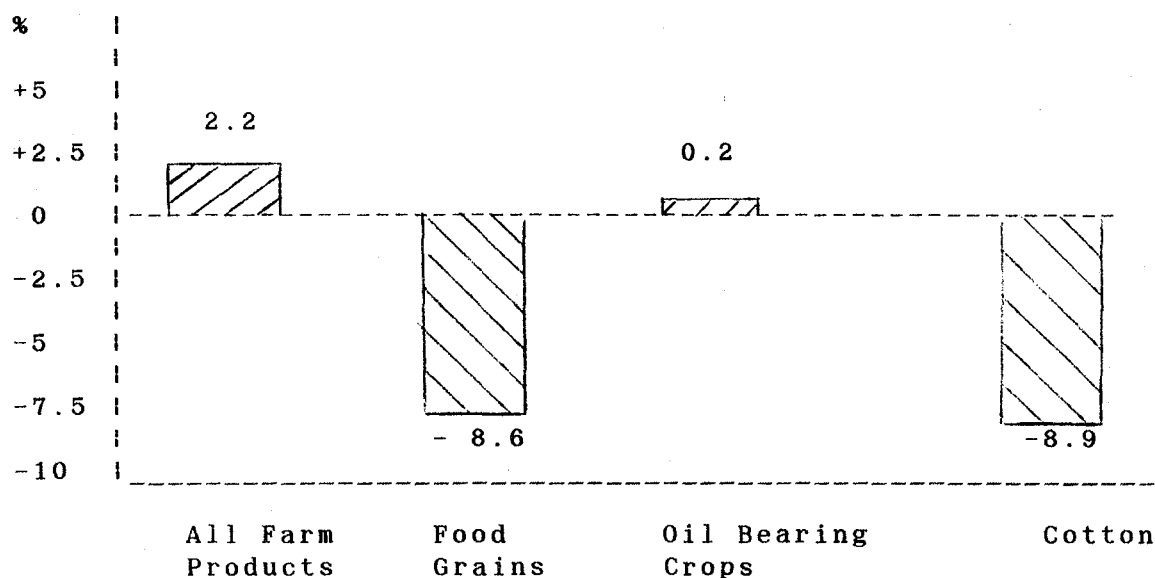
Figure 1. Change in Average Value of Farm Real Estate per Acre, 1984-1985 and 1981-1985.



Source: 1985 Agricultural Chartbook, U.S. Department of Agriculture, December 1985.

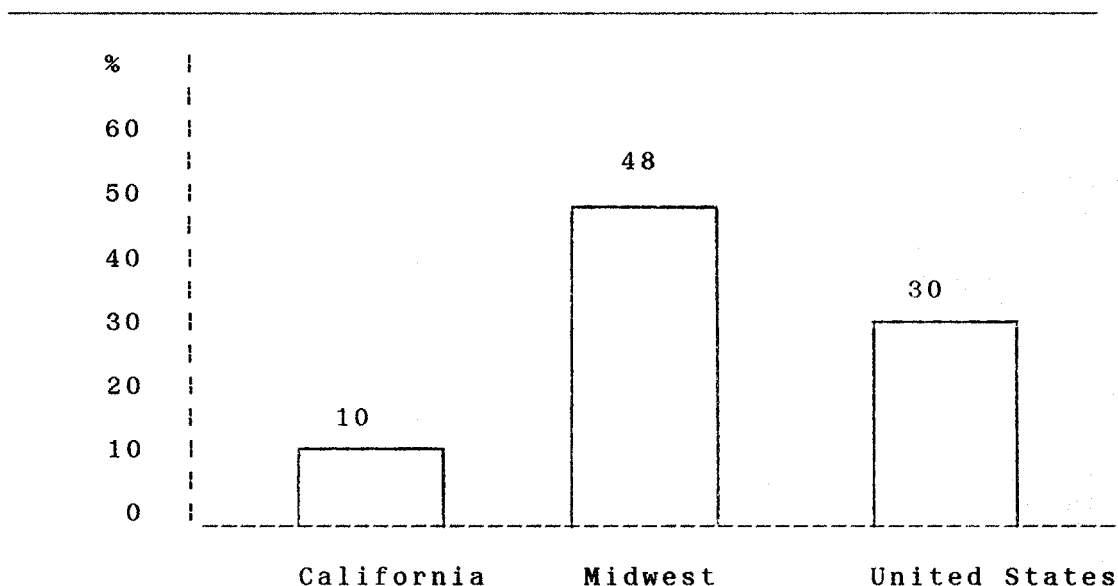
The dollar had appreciated, from mid - 1980 until March 1985, more than 50 percent compared to a weighted average of currencies of the United State's major trading partners. The result of an appreciating dollar has been a 30 percent decrease in net farm exports since 1981, about two-thirds of the decline due to the drop in exports. Grain, oilseed crops and cotton have borne the brunt of these reduced exports. About 80 percent of the drop in exports is accounted for by grains, oilseeds and oilseed products. Cotton exports contracted significantly in 1982 and 1983, with 1984 and 1985 recovering some of the lost gains, with farm prices reduced near 45% from the early 80's peak. Textile imports further magnified domestic cotton producer's problems, up nearly 50 percent since 1981.

Figure 2. Percent Difference in the Average Price Index for 1981-1984 Compared to 1980. (FRBSF, 1985)



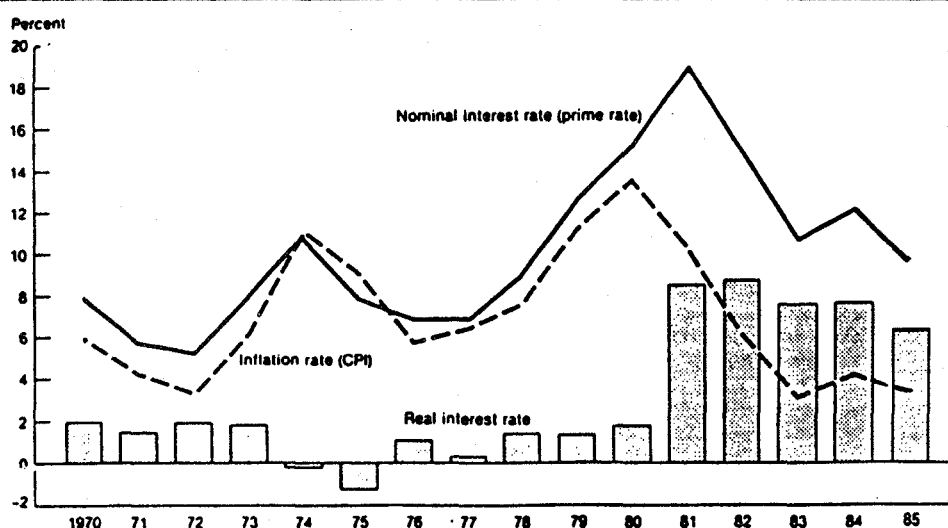
Commodity price escalation and its resulting expansion mentality have been purged from agricultural producer's behavioral patterns. As the chart shows, grains and cotton, two "dollar sensitive" crops, have price indexes declining in the 1980's. On the producer's perspective cotton was \$.92/pound and now is about \$.55/pound. Corn prices per bushel for midwest farmers occasionally flirted with \$3.25 and have retreated to \$2.40. Soybean revenues, once consistently around \$7.00/bushel have weakened to \$5.20. But fruit and vegetable price indexes have risen slightly in 1984 and 1985 due to inclement weather in producing areas and a less substantial reliance on international trade for continued sales. In California, prices for almonds and grapes have been depressed by oversupply attributable to vineyard and orchard establishment encouraged in the 1970s. Per-acre values of land planted in raisin grapes have fallen 50 percent since 1982 in the central San Joaquin Valley. Almond orchard market values have also declined sharply, following the producer's return per shelled pound from \$2.60 to \$.65 in four years.

Figure 3. Grains and Oils Bearing Crops as a Percent of Total Farm Production (1984) (FRBSF, 1985)



Inflation expectations, escalating commodity prices and rather "easy" credit extension during the mid 1970's all contributed to the appreciation in the value of farm land. From 1975-1980, agricultural commodity prices rose 6.5 percent annually, consumer goods prices 10.5 percent, and farm land 18.7 percent (in California, farmland values rose 23 percent per annum over this period). Negative real interest rates were a boon to borrowers, encouraging leveraged speculation, monetization of past appreciation and a lifestyle and investment pattern their incomes could not support. The continual unmatched returns to real estate ownership, during even the sedate 1950-1970 score, had encouraged farmers to load up on land, damaging cash flow coverage, flexibility, and most of all liquidity.

Figure 4. Inflation, Nominal Interest Rates, and Real Interest Rates, 1970-1984.



Source: 1985 Agricultural Chartbook, U.S. Department of Agriculture, December 1985.

Table 2. Changing Asset Distribution of American Farmers.

			<u>Percent of total</u>		
			<u>1950</u>	<u>1984</u>	
I	L	I	Real estate	58	75
N	I	I			
C	Q	I	Household	6	3
R	U	I			
E	I	I	Machinery	9	11
A	D	I			
S	I	I	Inventories	15	8
I	T	I			
N	Y	v	Financial Assets	12	3
G					

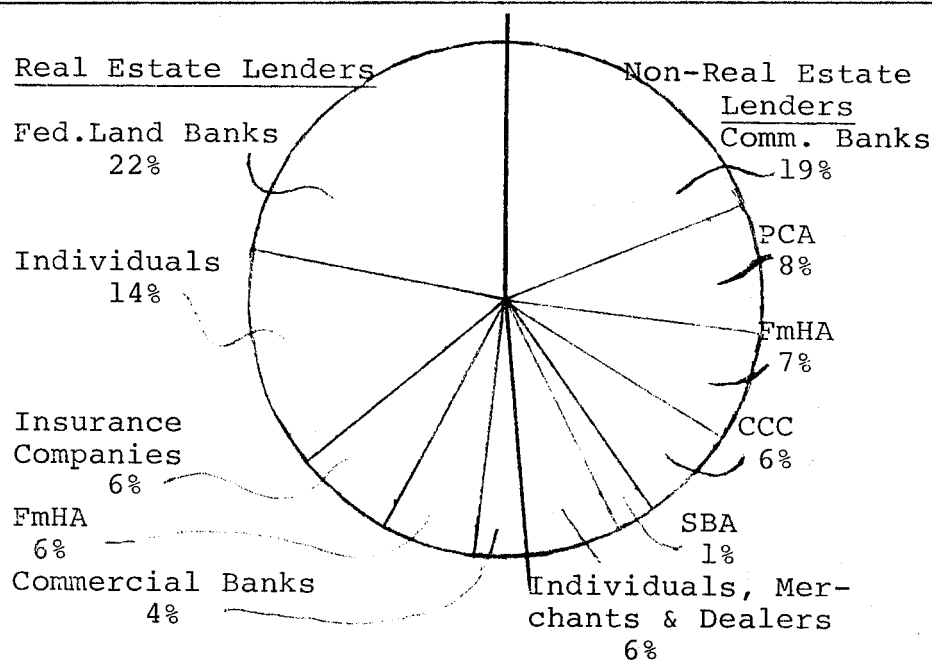
WHO HOLDS THE OUTSTANDING FARM DEBT

Of the some \$215 billion in farm debt, 52 percent is being used to finance real estate purchases, while the remaining 48 percent is non-real estate debt. This 1/2, 1/2 split has held in American agriculture since the 1920's, skewing more heavily toward real estate indebtedness during the booming agricultural cycles. The following table best pictures the relative influence and market share of lending institutions and organizational type.

Table 3. The Lenders in American Agriculture, 1985.
(\$ billions) (Melichar, 1985)

	Private Sector	Coop Sector	Public Sector	Total
<u>Real Estate Debt</u>	\$50	\$48	\$12	\$110
	Individuals \$30	Federal Land Banks	Farmer's Home Adm.	
	Insurance Companies \$12	Banks \$8		
<u>Non-Real Estate Debt</u>	\$57	\$18	\$30	\$105
	Individuals, Merchants & Dealers \$17	Production Credit Assoc. \$18	FmHA \$15	
	Banks \$40		Commodity Credit Corp. \$13	
			Small Business Adm.	

Figure 5. Market Shares of Farm Lenders.



SOURCE: Agricultural Banking Experience, Emanuel Melichar, Board of Governors of the Federal Reserve System, 7 May 1985.

Looking quickly at the most recent trends and behavior of these lending groups reveals some rapidly changing shares and strategies. In real estate lending, individuals have continued to finance land transfer via the installment land

contract, deed and mortgage or a more hybrid fixed-principle saving instrument into the 1980's. Although the exposure has leveled off since 1980, the most significant trend evidenced during the 1970's and the 1980's was the shortened maturity coupled with balloon or accelerated payments schedule. Ten to fifteen year amortizations with five to 10 year balloons are unfundable even at generous commodity prices. Thus, on more than a few occasions, retired farmers, having sold during appreciative late 70's or early 80's have become land owners once again, with no "deep pockets" against which to collect a deficiency judgment, now holding an asset, farmland, that has deflated in nominal values 40 to 60 percent in some areas (predominantly the Western Corn Belt and North Central Region).

Insurance companies learned soon enough that loaning to farmers and collecting 7 - 10 percent interest was not as lucrative as buying the land themselves, realizing the 20 to 30 percent annual appreciation and systematically selling the old parcels at a later date. Two primary problems arose to hamper this strategy. First, some states forbid corporate ownership of farm property, aside from closely held family "farming" corporations. Second, the bubble burst in many states as early as 1982, while the investor had been acquiring property for the previous five years. Needless to say, some life insurance companies are today holding equities (farmland) which have depreciated 40 to 60 percent from the last transaction price, their cost. Insurance companies tried to maintain their lending market share by introducing shared appreciation mortgages and equity participation loans to farmers during the early 1980's. Neither caught on among producers and the insurance lenders have concentrated recently on the large, healthy borrower and managing default for the less fortunate.

Commercial banks have played a lesser role in real estate lending due to their liquidity preference and regulatory barriers. The chartering and regulatory authorities institute legal lending limits to force diversification among borrowers and match loan size to bank carrying capacity. But in addition, many banks in rural areas just lack the sheer size even an average sized agricultural borrower needs. Due to loan limitations or financial expertise desired, many farmers cannot be adequately served by their "local" commercial bank. The large, holding company institutions do and can serve agriculture diligently and dutifully, while "urban center" banks look to other industries for loan demand and service clientele.

The Cooperative Farm Credit System's Federal Land Bank Associations have become leading real estate lenders for farmers over the past decade. The loan package better fitting agricultural repayment capacities, with maturities of up to 40 years, have encouraged producers to consolidate debt (both long and short term) and monetize the appreciation of their land for expansion or increased living standards. Variable interest rates have been predominant since 1971, as well as the benchmark farms approach to appraising mortgaged land. This method, although void of

urban and developmental influences on land value is not true agricultural "use" value. The speculative tendencies of both farmers and investors was captured in land valuations, resulting in loan-to-income capitalized values of close to 1.4 in most major farming areas. Now that the speculative influences, inflationary hedging and abundant incomes of the most recent decade have subsided, the Farm Credit System has had to "stockpile" millions of acres and bad loans under a new entity, the Farm Credit System Capital Corporation, created to warehouse the repossessed properties and provide a direct link to the U.S. Treasury for liquid cash and most importantly preservation of investor confidence in Consolidated Federal Farm Credit System Securities.

The Farmers Home Administration (FmHA), an agency run by the USDA, has played a larger role in real estate lending recently. Through either the insured or guaranteed loan programs (with loan limits of \$200,000 and \$300,000 respectively), exposure in agriculture has increased four-fold since 1977, so that in 1986, the FmHA has more loaned to farmers purchasing real estate than either commercial banks or life insurance companies.

Looking at non-real estate debt reveals similar market share shifts. Beginning with the public sector lenders (FmHA, Commodity Credit Corporation and Small Business Administration), the loan growth has been staggering. The FmHA funding parallels their growth in real estate lending, a four-fold increase in 8 years. With around 30 different loan authorities to varying clients (farmers, rural homeowners, rural communities, grazing associations, etc.), some semblance of their "lender of last resort" behavior was lost by the end of 1979. With new Economic Emergency loans authorized to aid suffering producers, the FmHA was confronted and delegated funds to a new clientele; anyone proving they had an economic emergency (due to price reduction, mismanagement, shoddy marketing strategies, good crops, etc.). The distribution of these "new" emergency funds was not to the same people as the ownership loans and traditional operating loans FmHA had been granting to the least credit worthy borrowers.

In the schematic provided, we see the distribution of operating loans, farm ownership loans and economic emergency loans to each borrower classification. The axis represent income and net worth with the first quadrant representing that most credit worthy borrowers, possibly able to borrow money elsewhere.

Table 4. Percent of operating, Ownership and Economic Emergency loans made to Respective borrowers by FmHA, 1979. (Boehlje, 1981)

		Income	
Ownership	17.5	^	4.0
Operating	19.7		6.5
Econ. Emer.	20.4		27.6
-----			> Net Worth
Ownership	74.4		4.3
Operating	68.1		4.9
Econ. Emer.	29.6		22.1

The Commodity Credit Corporation (CCC) makes non-recourse commodity loans to farmers, using stored crops as collateral. With the ability to forfeit the crops to CCC in lieu of having to pay back the loan, the loan price serves as a price floor for many producers. With domestic and international prices below the CCC loan rates for many commodities over several years, the government has become a large purchaser of farm commodities and operating credit extended by the CCC is becoming very commonplace.

From 1976-1979, the Small Business Administration (SBA) also made loans to agricultural producers. In not being trained agricultural lenders, the SBA made some questionable subsidized loans to a few abusive borrowers who were seeking, and received, their portion from the "public trough".

In surveying the public sector's influence in agricultural credit, one must ask if either the easy credit and loose pursestrings of the lenders is a cause or response to the "credit and profitability crisis" and if nearly 1/4 of non-real estate debt and 1/5 of all farm debt should continue to be originated from the U.S. Treasury and ultimately taxpayers pockets?

The Farm Credit System's Production Credit Associations (PCA) are the retail outlet for operating funds for farmers and agricultural businesses. The network of locally owned PCAs have extended about 17 % of the non-real-estate debt to farmers. Generally speaking, in the geographic areas where commercial banks have chosen to de-emphasize agricultural lending, PCA's are relatively healthy and maintaining their loan volumes. In other areas, where some banks are limited to agricultural credits, the PCA's average cost pricing and stock freezes are discouraging patrons and borrowers, resulting in less support for a somewhat troubled ship.

Merchants and dealers, through open accounts, revolving lines of credit or more formalized purchase money equipment transactions became heavily involved in agricultural lending in the 1970's. To encourage sales and decrease business seasonality, equipment manufacturers and vendors established finance subsidiaries to assist purchasers in acquiring new equipment. Most recent behaviors of these lenders include: 1) an exodus from agricultural lending, 2) an increase in industrial and commercial lending and 3) realization that farming (production agriculture) is a cyclical and risky industry, the specialization required and added lending risk is not worth the dealer's effort. (Eaton, 1986)

Commercial banks continue to be the dominant lender to farmers for non-real estate debt. (A discussion of agricultural bank failures will be provided later in the paper). Many rural banks, finding agriculture is the "only game in town", prospered during the 1970's with aggregate loan-to-deposit ratios approaching urban counterparts. But since 1982, banks have constricted their agricultural credit to the most worthy borrowers while rural banks profitability has dropped, failures are increased and loan-to-deposit ratios for rural banks is back to 1970 level (~ 55 percent).

The aforementioned private, cooperative, and public sector lending institutions have responded to the ongoing credit and profitability crisis in agriculture in sometimes uncharacteristic ways. The following focuses on the major responses and treatments championed by the respective lenders.

WHAT IS BEING DONE

Farm Credit System

In allowing more timely and efficient adjustments within the system, the Federal Farm Credit Board has authorized the Farm Credit Administration (FCA) to transfer funds and equities between the Farm Credit System (FCS) institutions. These broadened fiscal maintenance procedures and loss sharing provisions enable the FCA to make fund transfers when:

1. the stock of a deposit bank is impaired
2. the debt-to-capital ratio of a bank exceeds 20 to 1
3. a bank is unable to pay its debt obligations, or
4. is not financially viable under other criteria
(stock-to-earned net worth > 2:1)
(debt-to-net worth > 15:1; for PCA's 9:1)
(non-earning assets-to-total assets > .15:1)

Systemwide assistance packages have already been instituted in this decade for the Federal Intermediate Credit Banks (FICB) of Spokane and Omaha. Some of the healthiest local associations (FLBA or PCA's) have resented having to bail out geographically separated districts, and have through legal avenues or cavalier membership voting

tried to block the systemwide assistance packages or bolted from the FCS, finding "new" (different) funding sources.

Figure 6. Districts of the Cooperative Farm Credit System.

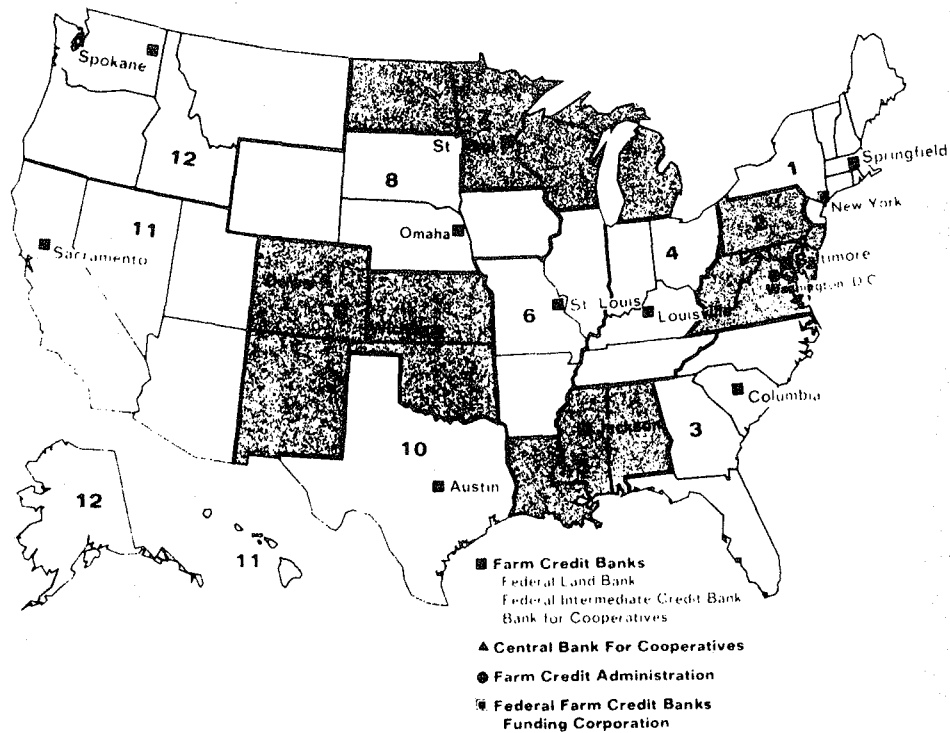


Figure 7. Non-earning Assets / Total Assets by Farm Credit District, 1985. (Gabriel, 1985)

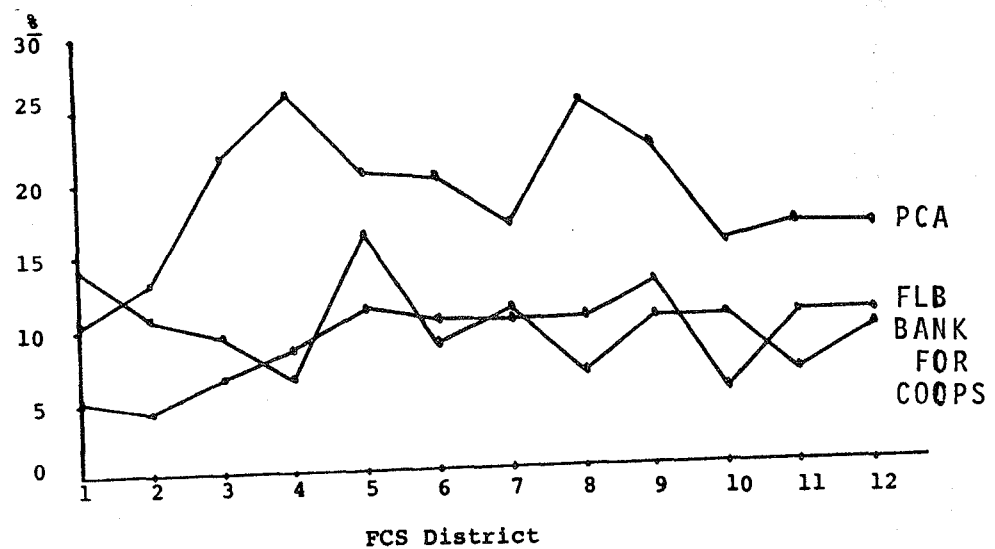
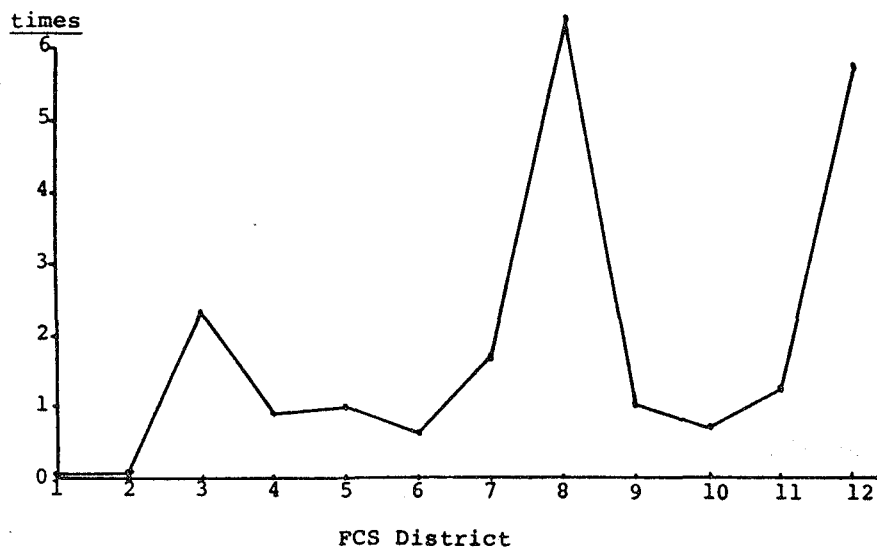


Figure 8. Non-performing Loans / Capital and Surplus.
(Gabriel, 1985)

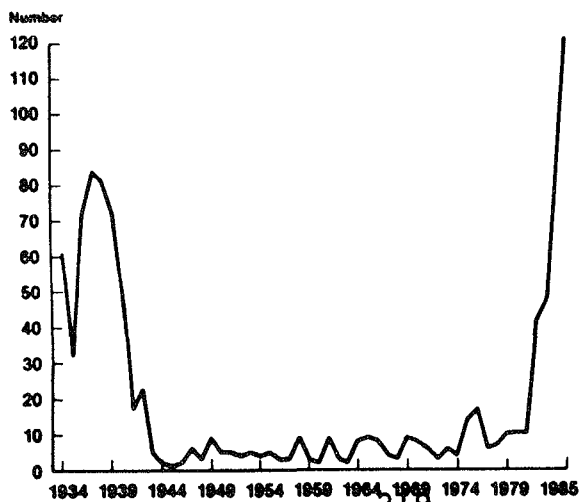


A rash of mergers, consolidations and business purpose examinations have characterized the FCS most recently. To consolidate strengths, achieve economies of scale, capture diversification benefits outside of agriculture and offer further financially related services (insurance sales, estate planning, record keeping, and cash management) those associations and districts able are rapidly evolving into full service financial centers while struggling associations and districts are losing borrowers, freezing stock redemptions and fragily preserving investor confidence.

Commercial Banks

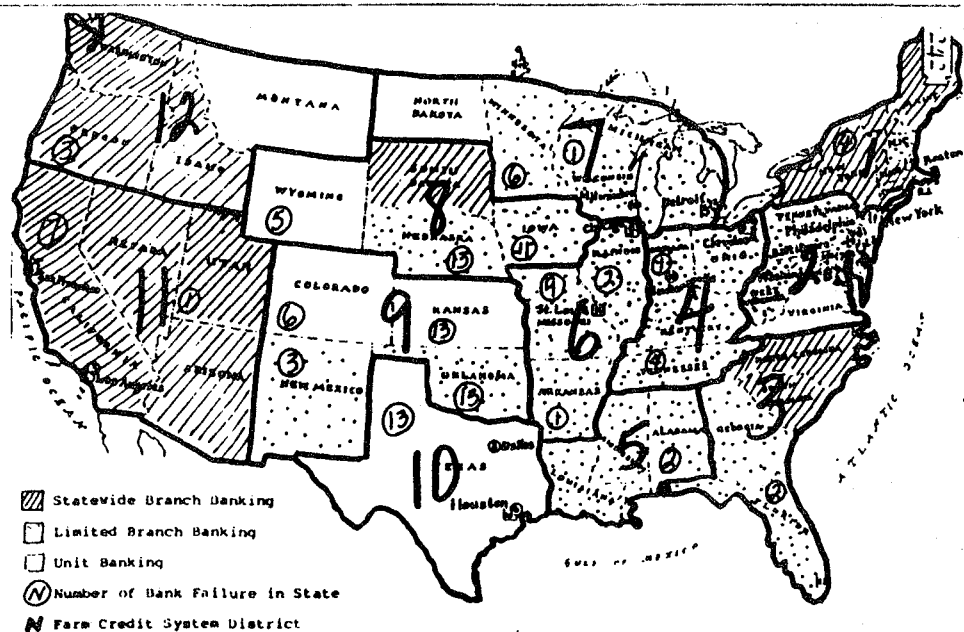
One hundred and twenty U. S. Banks Failed in 1985, far more than in any year since the great depression (1930's).

Figure 9. FDIC Insured Bank Failures. (FRBSF, 1986)



The Federal Deposit Insurance Corporation (FDIC) rates some 1196 others as "problem" banks, based on assessments of capital, assets or earnings inadequacies. The 120 failed banks in 1985 represented less than one-half of one percent of total U.S. bank assets. All but six of the 1985 failures had assets of less than \$100 million with the average \$28 million. (The largest was \$214 million; the smallest was \$2.7 million.) Sixty two of the 120 failed banks in 1985 were farm banks - those with more than 25 percent of their loans in agriculture. Forty-three of the 62 failed banks were their community's only financial institution. The geographic distribution of failed banks supports the view that despite the general economic recessions of 1980 and 1982 and a hearty recovery since, some sectors are suffering due to a shift from a high-inflation to low-inflation environment, relatively strong dollar, record high real interest rates, reduced export demand for commodities and resulting farmland and energy prices. Thus many banks are saddled with non-performing agricultural, energy and real estate loans. Of the 280 bank failures from 1982 to 1985, seventy percent were concentrated in 10 states. These states include Iowa, Nebraska, Kansas, Illinois, Missouri, Oregon, Oklahoma, Texas, California and Tennessee.

Figure 10. Farm Credit Districts, Bank Structure, and Failed Banks by State, 1985. (Elder, 1986)



Tennessee's 31 failures (1982-1985) were largely due to insider abuse, fraud and mismanagement, while California's 20 failures resulted from factors including agricultural and real estate lending problems. Twenty-seven states experienced one or no bank failures during the 1982-1985 period.

Of the 120 bank failures in 1985, some 22 non-farm bank failures can be attributed to energy loan credits, 16 in Oklahoma and Texas. Nebraska (13), Iowa (10) and Kansas (9) infamously headed the farm bank failure barrage in 1985. Further depression of commodity prices and associated farmland values continue to exacerbate the problem in 1986.

Of 21 failed banks in the first quarter of 1986, nine of the failed banks were agricultural banks.

In Nebraska, as well as most farm states, the FDIC provided more auditors to keep up with the work load. When a troubled bank would finally move too low in its ratios, FDIC examiners would enter with a task force of 10 to 20 members on a Friday night, categorize loans in the bank's portfolio as performing and non performing, and by Monday morning (if the bank's loan portfolio represented sufficient value), that bank would be taken over by one of the larger Omaha or Lincoln banks under Nebraska's existing limited branch banking laws. Note that many of the midwestern states did not have either regional banking or limited branch banking before 1980. This means that each individual bank had to stand on its own, and default meant liquidation of the bank unless new investors could be found. With the passage of a state limited branching bank law, larger financial institutions could purchase banks in adjoining counties and open them as a branch bank. When a bank default occurred, this process provided a smoother transition for those farmers, businessmen and depositors who depended on the local banks for their financial services. However, for those whose loans were in default, it meant unavoidable liquidation. But many times it took up to 2 years to completely liquidate these loans from a failed bank.

Recent regulatory changes and easing of accounting rules have enabled some agricultural banks to avoid being thrust into the failed category. There are about 4000 farm banks in the U.S., of which 1300 are presently under some special supervision due to problem loans. Allowing capital to draw down to less than 6 percent of assets, regulatory forbearance in debt restructuring, and loan charge-offs are at the heart of the U.S. Comptroller, Feds and FDIC actions. Additionally, the regulatory agencies are seeking the allowance of the small failed bank to be acquired by out of state institutions, an option presently prohibited 1) before actual failure, or 2) if the failed banks assets are under \$500 million.

Further regulatory amendments are under consideration. The first concept is the "bridge bank" proposal. This would allow the FDIC "to actively run and operate a failed bank for a limited period of time", settling with insured depositors, warding off a crisis if a big bank were failing, and systematically courting an acquirer or investor for the institution. The second concept is the "risk adjusted FDIC premiums". Although in the evolutionary stages, recommendations are to charge high risk and/or restricted structure state banks up to twice the normal one-twelfth of 1 percent of the domestic deposits premium. This premium presently insures depositors to a maximum of \$100,000. Concept three would allow federal laws to pre-empt state's laws that presently restrict branching activities. These state regulatory curbs are hypothesized to discourage (forbid) acquisitions of failed banks by geographically removed institutions. Relaxation of the current laws prohibiting out-of-state acquisitions of small

or not yet failed institutions would aid, without regulatory involvement, in saving the bank and area served.

In 1985, the bulk of midwestern bank failures were treated in one of two ways. The first method was deposit payoff. This scenario has the FDIC paying depositors the value of their accounts up to \$100,000, selling the failed banks assets to settle with creditors, the insurance fund and unsecured depositors. Secondly, in the purchase and assumption method, the failed bank is sold to another financial institution or investor group who are willing to assume most of the failed banks liabilities, including deposits. In return, good assets (healthy loans, securities, building and plant) plus cash from the FDIC for the amount of the assumed liabilities minus the purchased assets is given to the acquiring party.

Widespread use of the purchase and assumption settlement option has resulted in few uninsured depositors at large failed institutions having suffered financial losses. The FDIC and other regulators informal pledge to never let a big bank fail has created a defacto deposit insurance for all large deposits at big banks, resulting in an undue deposit gathering advantage and lack of market discipline and restrained risk-taking. Due to the deposit payoff (liquidation) settlement method prevalent in the small institution's case, uninsured large depositors were incurring more risk than if deposits were with a large, protected and potentially "insured" bank on the brink of failure.

Following the record setting 1985 bank failure activity, concentrated in a small number of agricultural and energy related states, a similarly large number of bank failures is expected in 1986. Several regulatory adjustments are suggested to lessen the hardship or show forbearance within the banking industry itself. But neither the number nor the magnitude of failure signal fundamental weaknesses in the banking system. But rather, specific economic sectors - agriculture and energy - impacts vary regionally and by bank portfolio.

Debt Restructure

Numerous loan restructuring and moratorium attempts have accompanied forbearance since the advent of widespread financial difficulties. (Harl, 1985)

Since January, 1986, the American Farm Bureau Federation has championed a debt restructuring plan in both the federal and farm-state political arena, urging regulatory changes to more readily allow banks and the Farm Credit System to restructure farmers loans. The Federal Deposit Insurance Corporation, Controller of the Currency and the Federal Reserve Board have been asked to relax the guidelines under which financially stressed lenders and borrowers are operating. The thrust of most "tiered" restructuring efforts benefit the lenders and borrowers in differing ways. For the banks:

1. The restructured loans would not be classified as non-performing assets, if the newly quoted loan terms were being met: "restructured and in compliance with modified terms" would connote an earning asset.

2. Banks could amortize a portion of loan losses over a five-year period, by accommodating losses in an interim account temporarily dropping an institution's capital requirement to below 6 percent.

3. No loan loss charge need be made if the aggregate principal and interest over the "new life" exceeds the original amount expected under the pre-renegotiated terms.

For the Borrowers:

1. Outstanding debt is divided into serviceable (tier 1) and non-serviceable (tier 2), based on more conservative and realistic cash flow projections than those estimated at loan origination.

2. As tier 1 debt is repaid, a similar amount of tier 2 is moved into tier 1 classification.

3. Market or prevailing interest rates would be charged on tier 1 debt, while tier 2 debt would be paid at, a) the government's cost of funds or, b) some minimal rate permitted through a public sector rate buy down. The ultimate success or acceptability of such a program depends heavily on 3 factors:

- * do farmers have the ability to amortize any tier 1 debt and service tier 2 at some subsidized interest rate?
- * is the bank or institution earning enough on the scant tier 1 balance and tier 2 "near permanent commitment" to opt for NO foreclosure?
- * will public sectors rate buy downs be adequate and enduring enough given budget deficits and political constraints?

Extension, State and Local Efforts

There are suggestions that much of the real problem behind the farm crisis of the 1980's stems from farmers taking long term asset appreciation and converting it into short-term and intermediate-term debt to fund consumer expenditures and capital equipment purchases during the late 1970's. It is further suggested that "iron disease", or the "need" to buy new equipment (to keep depreciation deductions high) was a problem behind the problem. During the 1970's many farmers estimated their tax bill near the end of their fiscal year, and then purchased new equipment to take advantage of the depreciation and investment tax credit. To capture this "tax savings", many borrowed to purchase the equipment. Furthermore, because the inflation rate was outstripping the interest rate, many were unaware

of their inevitable cash flow constraints. As long as the conditions of high inflation and relatively strong commodity prices continued, it appeared to be a winning situation.

Even the local farm lender was encouraged by the circumstances. The farmer's balance sheet, with the highly valued land and machinery, provided financial ratios that were positive to an equity-based lender. A tractor bought in 1970 would sell for more than the original purchase price in 1975. During the good times in agriculture, lenders were encouraged to have their capital earning a return, and with equity-lending, were anxious to get the farmer to expand his outstanding debt. Unfortunately many farmers and lenders lost sight of what could happen to cash flow during harder times. After an appreciated dollar softened many of the export markets with the resultant effect on commodity prices and the depressing effect on land values, many farmers were astounded to see that they could have anticipated these results.

The Cooperative Extension Service and the Land Grant Universities in most of the midwestern states provided educational and financial assistance programs for their farmers. Many states used similar approaches to the problem. Their programs often consisted of workshops to educate the farmers in determining their present financial situation and in developing a plan for the next several years and analyzing various alternatives designed to help follow the plan. The following table provides a partial summary of the approaches used by those states with programs.

Table 5. Components of State Financial Management Programs in Midwestern U.S. * (USDA, 1986)

STATE	ED	#	COMP ANAL	1 ON 1	CASH FLOW	HOT- LINE	STRESS	GOALS
Alabama	x	1000	x	x	x		x	
Georgia	x			x	x		x	
Idaho	x			x	x	x		
Illinois	x	10000	x	x	x	x	x	
Indiana	x		x	x	x	x	x	x
Iowa	x	20000	x	x	x	x	x	
Kentucky	x	500		x	x	x		x
Michigan	x		x	x	x	x		
Minnesota	x	30000	x	x	x	x	x	
Mississippi	x		x	x	x	x	x	
New Mexico	x			x	x			
Missouri	x	900	x	x	x	x	x	x
Nebraska	x	250	x	x	x	x	x	x
N. Dakota	x	1000		x	x	x	x	x
Ohio	x	122	x	x	x	x	x	x
Oklahoma	x			x	x	x	x	
Oregon	x			x	x			
S. Carolina	x	5000	x	x	x	x	x	
S. Dakota	x		x	x	x	x	x	x
Tennessee	x	9000	x	x	x	x	x	
Texas	x			x	x	x		
Wisconsin	x			x	x	x		

* Includes only information presented in a summary of each state's activities. Some of these activities may have been included in the program but were not listed.

The twenty-two states, for which program reports were available, provided crisis programs to deal with the financial management problems present in their area. All 22 offered educational experiences, one-on-one counseling and cash flow analysis. Outreach programs ranged from a very intensive program for 122 cooperators to a less intensive instruction or assistance for 30,000 cooperators. Thirteen state indicated that they used a computer program for long range financial budgeting and/or cash flow projections. Of those 13 states, 7 indicated they were using Minnesota's FINPACK computer program series. Most of the programs targeted the hardest hit counties but made their programs available across the state. As a means of communication with individual farmers to inform them of the program and to answer questions, 18 of the 22 states reported using toll free HOTLINES. Many states had both private and agency HOTLINES available for financial counseling. Fifteen indicated that they provided stress counseling programs. Nine of the states indicated an ongoing program approach of emphasizing their Farm Business Association Record Keeping Program. Off-farm job counseling, retraining or relocating programs were provided in 11 states. Ten of the states indicated that they were developing special materials for their programs. However, only 7 states mentioned "goal setting" as a part of their program. This appears to be a long range approach that could bear much fruit.

Table 6. Hotlines to Help with Finances and Emotions.
(Williams, 1986)

State-supported services:

Ideho: Farm Family Hotline	800-257-3276
Illinois: Rural Route Hotline	800-847-6883
Iowa: Rural Concern Hotline	800-447-1985
Kansas: FACTS Hotline	800-321-3276
Michigan: Farm Financial Crisis Hotline	800-346-3276
Minnesota: Home Preservation Hotline	800-652-9747
Project Support	800-843-4334
Missouri: MO FARMS Hotline	800-662-2767
Nebraska: Workshops and counseling	800-535-3456
North Carolina: Farm Crisis Hotline	800-782-3276
Land Loss Prevention Project, NCCU, School of Law	919-682-5989
North Dakota: Farm Credit Counseling Hotline	800-642-4752
Ohio: Farm Crisis Hotline	800-253-3276
Oklahoma: Agr. Link Hotline	800-247-5485
South Dakota: Ag Finance Counseling	800-228-5254
Texas: Dept. of Ag., Craig Bryant	512-463-7512
Wisconsin: Farm Hotline	800-362-3020

Private or grass-roots farm financial counseling:

Colorado: Ag Hotline	303-648-5382
Georgia: New Hope, R.R. #1, Plains, Ga.	912-824-7711
Illinois: Illinois South Project, Herrin, Ill.	618-942-6813
Indiana: Indiana Coact, Jim and Barb Adams, Noblesville, Ind. (nights only)	317-773-4763
Phil and Susan Bright, Centerville, Ind.	317-855-2265
Iowa: Farm Survival Hotline, Iowa Farm Unity Coalition, Des Moines, Iowa	515-244-5672

Kansas: Kansas Rural Center, Whiting, Kan.	913-873-3431
Kentucky: Kentucky Farmers Survival, Hal Hamilton, Rt. 1, Pleasureville, Kent.	502-878-4626
Michigan: National Farm Borrowers Assoc., Roy Walker, Fremont, Mich.	616-821-0323
Minnesota: Farm Crisis Hotline, Harold Kvale, Glenwood, Minn.	612-634-4440
Missouri: Farm Counseling Services, Memphis, Mo.	616-465-7232
Montana: W.I.F.E. Farm Crisis Hotline, JoAnn Forsness, Wolf Point, Mont.	406-653-2492
Nebraska: Farm Crisis Hotline	402-846-5578
New York: Farm Stress Hotline, Arlene Shako, Scholarie, N.Y.	518-872-1958
North Carolina: Farm Survival Hotline	919-542-5292
North Dakota: Family Farm Legal Assistance Project, Mary Lacina, Dickey, N.D.	701-883-4445
Ohio: Family Farm Movement	614-224-4111
South Carolina: Farm Survival Hotline, Leon Crump, Cheraw, S.C.	803-537-2541
Michael Sligh, Taylor, S.C.	803-288-3452
South Dakota: F.A.M.I.N.E., Wecota, S.D.	605-598-4546 or 605-947-4146
Tennessee: National Farm Borrowers Assoc., Lewisburg, Tenn.	615-359-7207
Andy and Debbie Lehnert, Pulaski, Tenn.	615-363-7177
Wisconsin: Wisconsin Farm Unity, Doug Harsh, Mondovi, Wis.	715-875-4548
Reggie and Kitty Pfyfer, Elroy, Wis.	608-489-3551
Wyoming: Farm Crisis Hotline, Torrington, Wyo.	307-532-5142

The Managing For Tomorrow Program in Nebraska

Nebraska will be used to typify many midwestern states affected by this financial and personal crisis. In the years from 1981 to 1985, total assets declined from \$43.5 to \$30 billion, primarily because of decreased land values (approximately 50 percent reduction). Total debt rose from \$8.7 billion to \$10.3 billion over this same time. Much of this increase appears to have been caused by accrued interest costs being rolled over until the next year. Total farm equity, decreased from \$34.7 billion to \$20.4 billion.

Table 7. Assets, Debt Claims on Assets, and Equity, Nebraska Farming sector. (January 1 Data for Years 1981-84, with January 1, 1985 Data Projected.) (Gessaman, 1985)

BALANCE SHEET ITEM	1981	1982	1983	1984	1985
					(PROJECTED)
		(BILLIONS OF DOLLARS)			
TOTAL ASSETS	43.5	42.0	39.9	35.8	30.7
TOTAL DEBT CLAIMS	8.7	9.6	11.2	10.7	10.3
TOTAL EQUITY	34.7	32.4	28.7	25.1	20.4

Non-real estate debt for the FmHA remained at less than \$1 billion until 1970 rising to \$15 billion in the early 1980's. Both Nebraska non-real estate and real estate debt follow a similar course. The increasing difference between real estate loans taken out and repaid in Nebraska from 1981 through 1985 is an indication of farmers deteriorating cash flow and reliance on monetized capital gains.

The Managing for Tomorrow (MFT) program, jointly developed by the University of Nebraska and the Cooperative Extension Service, places a strong emphasis on training in goal setting. This program used the microcomputer to determine the farmer's present situation and to develop and analyze new alternatives for those farmers. The goal of this comprehensive farm financial management program was to help families gather, organize and analyze information to make informed decisions regarding their future. Extension farm management specialists worked directly with 20 families in a group through four days of in-class training to develop farm and family goals for the long-run and short-run. The farmers and their spouses reacted quite favorably to the idea of goal setting and sharing of information with the advisors and with their spouses. The farm couple constructed a comparative cash flow table for the last 5 years. Many of the cooperators needed to go to their agricultural lender to request these documents. Some remarked that they would have made different purchase decisions if only if they had seen these projections 5 years earlier.

alternatives that they might be able to use to achieve these goals. During the remainder of the in-class portion of the MFT program, the farmers also organized their personal, cropping, and financial information and prepared input for FINPACK, a package of four financial analysis computer programs (developed by the University of Minnesota). The first output of FINLRB, the financial long range budget program, was used to determine if the computer had accurately modeled the MFT cooperator's farm. If it had not, input changes were made until it typified their farming operation. The farm management team (couple) then tried various alternatives; such as restructuring debt through any of the available programs, changing cropping patterns, changing resource input mix of fertilizer etc., liquidating assets and debt and even liquidating the farming operation. Another computer program, FINFLO, provided the farm couple with an estimate of their one year cash flow projection. A third program FINTRAN, was used to develop a three year cash flow and was designed to show what would happen during the transition period when changes were being made in the farming operation.

After the in-class portion of the MFT program, the farm management specialist would visit the couple on their farm, review their goals, and look at any other alternatives that were appropriate. When satisfactory plans were developed, many of the MFT financial analysts helped with some of the financial documentation needed for new loan programs.

Two other meetings at the county extension office were scheduled for each family. Followup meeting were planned for the next year.

For those farmers with immediate problems, the University of Nebraska provided another short term counseling program entitled Managing For Today. This program also used financial analysts to assist farmers in determining their present financial situation and alternatives available to them, and providing assistance in completing either SBA, FmHA or other loan documentation.

In addition to the MFT program, the Farm Business Association (FBA) has an ongoing program to allow farmers to seek assistance in record keeping and having an analysis completed of their farming operation each year. In some states this is a group program, and in others it is an individualized program.

Private Efforts

A private state-wide HOTLINE (Farm Crisis HOTLINE) was developed in Walthill, Nebraska. This HOTLINE was used to provide information to farmers on a variety of subjects. First, volunteers were available to listen and provide a caring shoulder for financial and spiritually troubled people to lean on. It served as an information dissemination center, and referred farmers to various agencies that could help them in the personal, private, spiritual, and financial needs. Farmers were referred to

lawyers for bankruptcy counseling, Managing For Tomorrow and Managing For Today for financial analysis and goal setting. Many were sent to SBA and FmHA for new loan arrangements, to other bankers, and to private and public consultants. Stress counseling remains one of the largest areas of need in this entire drama. This HOTLINE provides and trains counselors to help by phone and in person. This and other programs, private and public, provided understanding people for listening and sharing and caring.

CONCLUSION

Farm producers, vendors and the creditors are facing considerable obstacles in weathering the profitability and credit crisis in 1986. Due to excess production capability, an illiquid real estate dominated asset base, and imprudent (in hindsight) expectations guiding behavior throughout the 1970's, individual farm operators are having to assess their prospects for continuing as a producer.

Farmer cooperatives, farm supply and food processing or distribution firms are not at all isolated from farm level turmoil. Cooperative equity is being tapped, distribution channels for major inputs (feed, seed, chemicals, and equipment) are in a state of flux and food retailers are continuing their expansion and diversification behaviors. The deregulation of financial markets and institutions in this decade have increased interest rate volatility and currency movements (fund flows and relative values).

The present situation is predominantly due to a lack of investor constraint and management expertise in combination with some unfavorable macroeconomic conditions beyond the individual business person's control. Occuring during a time of relative prosperity across the entire economy, the agricultural finance industry is trying to deal with adverse financial conditions in several short-term ways, with few far reaching structural and long-run adjustments.

At the micro level, many government agencies have developed and are continuing to develop programs to provide financial and personal assistance for farmers and agribusinessmen. These programs have had much impact in many areas. However, for many in the farm sector it was too late. These people are making tremendous adjustments and have been the beneficiaries of many short-term programs. In addition to programs addressing immediate needs, goal setting for individuals, such as Nebraska's MFT program, is a long-term exercise deserving of more governmental, extension, state and local attention.

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THE EFFECTS OF GOVERNMENT PRODUCTION CONTROL PROGRAMMES ON TECHNICAL EFFICIENCY OF EGYPTIAN FARMS

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SUMMARY

The frontier production function approach is applied to derive the Farrell technical efficiency (TE) indices for Egyptian farms in producing corn, rice and cotton (characterised by free-market, fixed delivery quota, and 100 percent forced delivery, respectively). The distribution of TE of corn growers had the highest variance, suggesting perhaps that some corn farmers motivated by the free-market oriented system were ahead of others in acquiring new cultivating techniques. Furthermore, corn growers seemed to benefit more from formal education and extension contact than cotton or rice growers. Finally, forced delivery system was found to have significant and negative effect on TE of rice growers.

Key Words: Technical Efficiency, Production Frontier, Egypt.

INTRODUCTION

Over the past two decades, the already large agricultural productivity gaps between the developed countries (DC's) and the less developed countries (LDC's) have further widen. For example, in 1960 the U.S. agricultural productivity was 200 percent of that of Egypt; in 1980 the figure had increased to over 300 percent (Kawagoe and Hayami, 1985). It is an irony to proclaim the success of green revolution in the LDC's while letting the ever widening productivity gaps between the DC's and the LDC's less pronounced. Many studies have been launched with the aim to identify sources of productivity difference. Lack of human capital is widely regarded as a major factor constraining technical efficiency (TE); and government crop production control programme is generally viewed as an obstacle to improve allocative efficiency. Thus, effort to quantify their impacts on efficiency is divided along the line. However, there is no doubt that lack of human capital will also adversely affect allocative efficiency and government crop production control programme will have negative effect on TE as well.

The agricultural policy difference between the DC's and the LDC's can be characterised as that in the LDC's agriculture subsidises non-agriculture and consumer and in

the DC's non-agriculture and consumer subsidise agriculture. This policy difference is likely to contribute to the productivity gaps between the DC's and the LDC's. To date, the studies of the effect of government crop production control programme have been often concentrated on allocative efficiency. Very few look into the effect on TE partially because the lack of proper econometric techniques to facilitate the farm-specific TE estimation. The recent development of the frontier production function approaches (Afriat, 1972; Schmidt 1976; Meeusen and van den Broeck 1977; Greene 1980; Schmidt and Lovell, 1980; Deprins and Simar 1985; etc) has provided basis for consistent measurement of the farm-specific TE.

This paper attempts to apply the frontier production function approach to study TE of Egyptian crop farms subject to different production policy regimes. Both the traditional "average" production functions and the deterministic frontier production functions are estimated for corn, rice and cotton. The statistical efficiency gain of the frontier approach over the traditional approach is discussed. The paper then examines the characteristics (first two moments) of the distributions of TE of Egyptian farms in producing these three crops, tries to identify factor constraining TE, and analyses the effect of forced delivery system on rice production.

AN OVERVIEW OF PRODUCTION POLICIES

Agriculture has traditionally been the most important sector of Egyptian economy. In order to provide an adequate food supply and a stable foreign exchange source, Egyptian agriculture has been subject to an extensive and complex system of government interventions. The government regulates cropping patterns for a selected group of crops in order to meet domestic consumption demands and provide sufficient availability for exportation as well as domestic industry (Habashy and Fitch, 1983). The current system of agricultural policies consists of delivery quotas, planting requirements, output pricing, and distribution of subsidised inputs through cooperatives, with fines to non-complying farmers. Delivery quotas, with prices fixed below free/world market levels, are enforced for rice, beans, sugarcane, cotton, and onions.

Three major crops-- corn, cotton and rice-- were selected in the study because they are representatives of three distinctive types of governmental crop control policies in Egypt, in that (1) cotton, is characterised by 100 percent forced delivery, (2) rice, has a system involving fixed quota delivery, and (3) corn, is not procured by the government.

Cotton is the most important industrial crop and has been subject to minimum area requirements since the 1960's. The entire cotton crop must be sold to cooperatives at lower

than world trade prices since governmental sales of procured cotton are sold for foreign exchange.

Between 40 and 60 percent of the annual total production of rice was delivered to the government at the fixed prices lower than those that would have purchased from free market during the period of the 1960's and 1970's. The forced delivery quota was set at 1.5 tons of paddy rice per feddan, but only about 1.3 tons per feddan was the average delivered amount (Ali and Gardner, 1982). Thus, farmers appear to be willing to pay the fines associated with non-delivery. The remaining production is available for trade in the free market.

If a farmer fails to deliver his quota to the cooperative, a fine may be charged against him. For example, the fines for failure to deliver one ton of quotaed rice is LE 51 and for cotton is between LE 20 to 50 per ton (Habashy and Fitch, 1983). However, the system of fines has not been very effective and there is no statistical series indicating how often and what proportion of actual fines have been collected.

Corn has not been subject to area allotments, nor has corn been under a fixed price procurement policy.

MODEL

This study employs the Farrell efficiency concept and estimates the production functions econometrically. The deterministic frontier production function approach is applied to independently estimate three single-crop production functions and to measure individual farm-specific technical efficiencies among farms in the sample.

Single crop Cobb-Douglas production functions are specified as:

$$y = b_0 \prod_{i=1}^k x_i^{b_i} \text{EXP}(e) = f(X;b)\text{EXP}(e), \quad (1)$$

where y is the quantity of output, x_i 's are the quantities of k inputs and b_i 's and b_0 are the parameters to be estimated. TE is measured by $\text{EXP}(e)$. Alternatively, because of high collinearity between output quantity and crop area, yield functions were estimated with all variables defined on a per feddan basis. However, a crop area variable was added to the yield functions so as not to impose a restriction of constant returns to scale. All production parameters except crop area are identical in both the yield function and the production. The yield function has the form:

$$y' = b_0 \prod_{i=2}^k (x_i')^{b_i'} x_1^{b_1'} \text{EXP}(e), \quad (2)$$

where x denotes variable area and y' , x_i 's are normalised by area, and b_1' is the coefficient associated with crop area in the yield function. The coefficient associated with crop area in two equations have the relation:

$$b_1 = 1 - \sum_{i=2}^k b_i + b_1'.$$

The single equation estimation of the frontier function is not without criticism. Antle (1983) suggested that a farmer's input allocation decision is generally dependent upon his TE level. This concern about the endogeneity problem parallels that of Marschak and Andrews (1944). Following Zellner, Kmenta and Dreze (1966), one can argue that a farmer's TE level is a random variable and his input allocation decision is based upon, among other things, his expected TE level. Thus, the endogeneity problem does not exist when the production frontier is estimated alone.

In Egypt, government influences every farmer's input allocation decision through mandatory rotation, planting requirement and input subsidy. The endogeneity problem in estimation of the frontier production function of Egyptian farmers will be much less severe than that of the LDC's.

Distributional Assumption

There are several distributions that have been broadly used, e.g. the exponential, truncated normal, and Gamma distributions to characterise the distribution of TE. Since we normally do not have any prior information about the appropriate distribution, it is customary to let the data dictate the shape of the distribution of TE. However, some specifications like the half-normal distribution, will superimpose the shape of the distribution and are not acceptable. The ideal distribution is one that is flexible enough to take various shapes.

The Gamma distribution is one which provides flexibility in distributional shape. It has two parameters, one for shape and, the other for scale, with the mean and the variance of the distribution being functions of the two parameters:

$$g(e) = \frac{\lambda^P e^{P-1}}{\Gamma(P)} \text{EXP}(-\lambda e) \quad e \geq 0, \quad \lambda > 0, \quad P > 0,$$

where P is the shape parameter and λ is the scale parameter. The limiting distribution of the Gamma distribution is the

normal distribution as the value of shape parameter goes to infinity.

In addition to its flexibility with respect to shape, the Gamma density function has another important advantage over other specifications. Other deterministic specifications often violate one regularity condition of the Maximum likelihood Method, namely the condition that the range of the dependable variable should be independent of the value of the parameters. If this condition is violated, then we cannot claim any statistical properties of the Maximum Likelihood Estimators (MLE's). The problem can be illustrated using equation (1). The range of the dependent variable is between 0 and $f(X;b)$ which depends on the value of the parameters, b , since $0 \leq \text{EXP}(e) \leq 1$. This is the regularity condition violated by most deterministic frontier approaches.

Greene (1980) showed that when the shape parameter is greater than two, the MLE's of the Gamma frontier do not violate that regularity condition needed to invoke the large sample properties when using Maximum Likelihood Method.

Estimation Results: Frontier vs OLS

For comparison, Table 1 shows the coefficients estimated by both the ordinary least squares (OLS) "average" function approach and the Gamma frontier approach. (For a description of the data set and variables, see Appendix.) The coefficient associated with nitrogen fertiliser in the corn function drew special attention. It is over .5 in both the OLS function and the Gamma frontier. (We know that corn is highly responsive to nitrogen fertiliser, but have no idea about the magnitude.) The nitrogen fertiliser coefficients in the cotton and rice functions are much smaller.

There is some reason to suspect that the nitrogen fertiliser coefficient should be lower in corn function and higher in cotton or rice functions. Farmers are said to reallocate nitrogen fertiliser received from the government from cotton to corn. Thus it seems likely that farmers might understate to interviewers the quantities of the fertiliser applied in corn field and overstate the quantities applied in the cotton field. If so, the estimated effect of nitrogen fertiliser on corn yield is exaggerated and the nitrogen fertiliser coefficient is biased upward.

We next need to examine the properties of the estimated parameters of the Gamma frontiers. We previously noted that the shape parameter, P , of the Gamma production frontier must be greater than two in order to claim that all estimated parameters have large sample properties. The estimated shape parameters are 7.9 for corn, 7.1 for rice, and 4.7 for cotton. There are well above 2; thus it can be claimed that the MLE's of the Gamma frontier retains all the large sample

properties.

The estimated slope parameters based on the Gamma frontier appear to be superior to those based on the OLS. According to Greene (1980) and Deprins and Simar (1985),

$$\text{Var}(b_i, \text{Gamma}) = \frac{P-2}{P} \text{Var}(b_i, \text{OLS}).$$

If P is greater than two, the variance of the slope parameter of the Gamma frontier will be smaller than that of the "average" function. It is obvious that more statistical efficiency gain can be achieved using the Gamma frontier if P is small. On the other hand, if P goes to the infinity, the Gamma frontier offers no advantage over the "average" function specification, since normality is the limiting case of the Gamma density.

Table 1: Estimated Coefficients of the Production Functions for Egyptian Farms (1982-83)

	Crop					
	Corn		Rice		Cotton	
	OLS	GAMMA	OLS	GAMMA	OLS	GAMMA
constant	-3.05 (-3.85)	-2.32 (-3.16)	-1.44 (-2.45)	-0.84 (-2.71)	-2.21 (-4.17)	-1.84 (-2.67)
seed	0.077 (0.64)	0.077 (0.74)	0.339 (5.22)	0.340 (6.17)	0.348 (1.69)	0.363 (2.34)
labor	0.210 (1.33)	0.215 (1.58)	0.085 (1.61)	0.086 (1.90)	0.094 (1.01)	0.094 (1.31)
nitrgen fertiliser	0.515 (3.44)	0.537 (4.15)	0.032 (1.88)	0.031 (2.18)	0.061 (1.98)	0.061 (2.64)
machinery	--	--	0.057 (3.08)	0.046 (2.95)	0.047 (1.10)	0.084 (2.61)
area (yield function)	-.044 (-.44)	-.044 (-.50)	-.007 (-.33)	-.007 (-.39)	0.071 (1.13)	0.071 (1.50)
area (production function)	0.162 (1.95)	0.127 (2.17)	0.479 (2.22)	0.575 (3.15)	0.520 (7.22)	0.468 (8.27)
shape parameter	--	7.93 (1.72)	--	7.10 (2.30)	--	4.68 (1.82)
scale parameter	--	11.35 (1.93)	--	11.85 (3.68)	--	10.55 (2.75)

* Numers in parentheses are t-statistics.

For all but one (machinery in the cotton function) slope parameters, t-statistics based on OLS are smaller than those based on the Gamma frontier. Although the OLS intercepts have higher t-statistics in the corn and cotton functions, the Gamma intercepts in these two equations are still significantly different from zero. Thus, we conclude that the Gamma frontier estimate is statistically more efficient than the OLS estimate.

DISCUSSION OF FACTORS CONSTRAINING TE

Distribution of TE

The mean TE index of the population can be estimated by:

$$E[EXP(-e)] = \left(\frac{\lambda}{1-\lambda} \right)^P.$$

The mean TE measurements are corn .51, rice .56 and cotton .65. A direct interpretation is that on the average corn production can be increased by 96 percent, rice by 78 percent and cotton by 53 percent, when all factors causing technical inefficiency are eliminated. Intuitively, the policy of a 100 percent forced delivery of cotton to the cooperative would have a negative impact on farmer's efficiency and his TE should be low. While corn production is less regulated, technical efficiency of corn production should be higher than that of a more regulated crop such as cotton. The above figures show the opposite. One possible explanation is that the frontier is a relative one derived from a sample rather than based on experimentation.

The comparison of TE between crops is not particularly valid but it can lead to a further probe of the finding. To explore possible explanations, the variances of TE of three crops are derived to show the dispersion of TE. The variances are .062, .0505, and .042 for corn, rice and cotton, respectively. The indication is that the spread of TE levels among corn production is about 50 percent wider than that of cotton.

To enhance a farmer's TE requires learning of technological information, motivation, experience, etc. Theoretically, a farmer can be one hundred percent technically efficient, producing right along the production frontier or extremely inefficient, producing zero quantity. The innovative farmers are quicker than others in acquiring new technological information about less controlled crops. As some farmers become more technically efficient than others, the dispersion of TE level widens and shows larger variance.

It is likely that all cotton farmers are at about the same levels of TE. The estimated frontier will be very close to their actual outputs and all farmers will be considered as relatively technically efficient. As a result, the whole crop industry would appear to be efficient. This is a pitfall of direct interpretation of TE from the frontier approaches.

On the other hand, some corn farmers motivated by the free-market oriented system were ahead of their counterparts in acquiring new cultivating techniques. Thus, the range of the distribution of the TE among corn growers was wider than that among cotton growers.

Sources of TE

A simple regression model is specified in an attempt to identify factors constraining TE,

$$TE = h(S;a) + u, \quad (3)$$

where S is the vector of variables that might influence a farmer's TE. (For definitions of the variables used, see Appendix.) The disturbance term is assumed to have the Gamma distribution to characterise factor quality differences. The result is presented in Table 2.

The corn function shows more significant variables than for either the rice or the cotton functions. The current crop procurement system may help explain this result. Since corn is the most free market oriented among the three examined crops, farmers might have greater incentive to monitor the input used in corn production.

In general, the most important factors associated with TE were education and extension contacts in all three functions and free market in the corn function. The frontier yield functions estimated in the previous section showed constant returns to scale. Yet crop area was found to have a negative effect on TE for corn and cotton. A brief discussion of the estimation results is presented on a crop-by-crop basis.

For the corn function, all estimated parameters but one (interaction between high school education and extension contact) are significantly different from zero. Age, education levels, extension contact and free market are of the expected signs. A farmer's TE seems to improve as the farmer grows older and accumulates more technological information, which indicates that experience, if proxied by age, is an asset in corn production. Negative interaction terms suggest that education and extension are substitute.

Crop area was found to be not significant in the frontier yield function (see Table 1), but a significant factor contributing to TE. Assuming TE, the frontier production function shows constant returns to scale. However, increased crop area has a negative impact on the farmer's TE. The extra demands of larger acreage of a simple crop apparently taxes the farmer's managerial skills.

Farm size, (i.e., the sum of crop area of all crops -- corn, wheat, rice, cotton, etc. planted during the year), has a small but significant influence on TE. This finding does not necessarily conflict with the negative effect of the crop area variable, because the correlation coefficient between crop area and farm size is only 0.30. In fact, as farm size increases, Egyptian farmers become more diversified in their cropping mix. Apparently, farmers can better handle more crops during one year than specialising in a few crops with larger acreage.

Table 2: Sources of Technical Efficiency

	Corn	Rice	Cotton
CONST	.499 (38.5)*	.550 (19.9)*	.523 (43.6)*
AGE	.002 (7.78)*	-.001 (-1.32)	.001 (4.58)*
CROP AREA	-0.062 (-12.0)*	.002 (.53)	-.006 (-11.9)*
FARM SIZE	.002 (2.46)*	-.002 (-.88)	.002 (2.53)*
EDU1	.018 (2.22)*	.008 (4.05)*	-.006 (-1.08)
EDU2	.053 (4.32)*	.005 (.148)	.003 (3.73)*
EXT	.043 (6.36)*	.015 (.065)	.023 (4.56)*
EDEX1	-.051 (-.438)*	-.010 (-3.01)*	NA
EDEX2	-.022 (-1.19)	-.022 (-4.40)*	.002 (.139)
FRMK	NA	.118 (3.07)*	NA
LAB	-.015 (-2.15)*	NA	-.029 (-4.42)*

Corn farmers seemed to benefit more from formal education and extension contacts than rice and cotton farmers (Table 3). One explanation is that farmers are more likely to seek information from extension agents about crops that which are less government controlled.

It is rather difficult to explain why the effect of grade school education on cotton production is negative. However, education has a overall positive effect on each of the three crops, justifying the government's policy to distribute new land among better educated who are more likely to be more efficient in crop production.

Forced Delivery and TE (rice)

The forced delivery system on rice, imposed by the Egyptian government, has been found to be highly regressive on the distribution of income in agriculture (de Janvry et al 1983). This is because marketable surplus is not constant across farm sizes. As a result of the high delivery quotas, only large farms have significant marketable surpluses after meeting delivery quotas and saving some for home consumption. Thus, large farms have the opportunity to profit from higher free market prices for a portion of their total production.

What if TE is related with crop area? The finding of a strong relationship between the two would have strong implications about the regressiveness of the forced delivery system. The system is even more regressive if TE is positively correlated with the crop area. In this study crop area was not found to be a significant factor associated with TE of rice farmer and for that reason we can't conclude whether the forced delivery system, in fact, further taxes small farmers.

The effect of removal of the forced delivery system on rice production has not been addressed properly. The findings by de Janvry et al (1983) were that the removal of forced delivery on rice would have a positive income effect on rice producers, but would have a minimal impact on rice output and on the marketable surplus of rice. The explanation did not consider that the rice yields might be lower than they would have been under a higher market price system, resulting from the disincentive effect of rice being procured at lower than the free market price, while a number of other crops were not.

If every farmer delivered the exact quota of 1.5 ton/feddan to the government, the more technically efficient farmers would obviously be those who had higher quantities of marketable surpluses. However, according to the survey upon which this study is based, not all rice farmers delivered the exact quota of 1.5 ton/feddan to the government. A few

For the rice function, only the intercept, grade school education, interaction between formal education and extension contact, and free market are significant. Both crop area and farm size are insignificant. Crop area is also insignificant in the yield function.

For the cotton function, the interaction between grade school education and extension contact was dropped due to collinearity. All coefficients except that of grade school education and interaction between high school education and extension contact have the same signs as in the corn function, and thus, the same interpretation.

Education and Extension and TE

Since observation on education and extension variables are identical for all crops produced by the same farmer, it is impossible to tell whether the farmer contacted the extension agents for information relative to a specific crop or to all crops, in general. Therefore, we must be cautious in interpreting the estimated coefficients. The effects of education and extension are tabulated in Table 3 below by evaluating the sum of coefficients for appropriate dummy variables, EDU1, EDU2 and EXT and then multiplied the sum by 100.

Table 3: Effects of Education and Extension Contact
on Technical Efficiency

Education	Extension Contact	Corn	Rice	Cotton
Illiterate (EDU1=EDU2=0)	Little (EXT=0)	Base	Base	Base
Illiterate	Extensive (EXT=1)	4.3	1.5	2.3
Grade school (EDU1=1,EDU2=0)	Little	1.8	0.8	-0.6
Grade school	Extensive	1.0	1.3	1.7
Diploma (EDU1=0,EDU2=1)	Little	5.3	0.5	0.3
Diploma	Extensive	7.4	-0.2	2.8

The effect of formal education on TE, as shown by the positive coefficients (Table 2) associated with grade school and high school education, suggests that formal education indeed enhances farmer's ability to acquire more technological information relevant to corn production than for cotton or rice production. High school education seems to be more effective than grade school education in contributing to farmer's technical efficiency. It shows the benefit of finishing high school education among Egyptian farmers.

farmers with small planted areas did not deliver any quantity rice to the crop at all. They, instead, sold significant portions of their outputs in the free market. Whether they were fined or not was not made known by the survey.

The sample mean delivery rate for rice was 52 percent of the output with a standard error of 20 percent (i.e., the coefficient of variation is nearly 0.40). Non-compliance prevailed among the rice farmers. Lacking information about each farmer's planned rotation patterns which might have included rice, we could not determine if any farmer failed to grow "planned" rice in the 1982-83 crop year. If so, the non-compliance would be still greater.

In the 1982-83 crop year, Egyptian farmers could expect to receive LE 120 per ton of rice sold in the free market, but only LE 95 per ton sold to the government. If a farmer sold in the free market all the rice that he supposed to deliver to the cooperative, he would earn an extra LE 37.5 per feddan. The LE 51 per feddan non-delivery fines is only LE 13.5 over the extra cash farmer can receive from sale on the free market. This amount is the real fines per feddan, which will go down as the gap between the free market price and the procurement price widens or as the quota increases.

The fine on failure to deliver has not changed since late 1960's (Habashy and Fitch, 1983). The current real rate of fine is equivalent to the market value of 0.1125 ton of rice per feddan. In the past, Ministry decrees or laws have excused farmers from paying their outstanding fines. The government has failed to discourage farmers from non-compliance.

The coefficient associated with the free market indicates that TE is positively related to participation in the free market. It reflects the adverse effect of the government intervention programme on the farmer's TE and the attraction of the free market to the rice growers. The positive and significant coefficient associated with free market variable suggests that the yield of rice may increase as the disincentive effect is removed. Technically more efficient farmers might be those who dared to break the law at the risk of being fined because they could afford the fines and took the risk.

One goal of the forced delivery system is the national goal of food supply security. The government is consistently overplanning the area requirement of rice production by as much as 13 percent because more "planned" rice production area is needed to offset the potential drop of procurement due to non-delivery. At present, government procures about 50 percent of the rice production per annum, 13 percent lower than if every farmers actually delivery the quota of 1.5 ton per feddan.

As stated previously, the fixed delivery quota is more unfavorable to the small farmers while the operators of larger farm can sell large quantities of outputs to the free market thus receiving the higher price, after delivery and home consumption. In the same vein, it is also more unfavorable to the less technically efficient farmers. It is even worse, if the fines for non-delivery are not levied.

CONCLUSIONS

Past studies of the effect of government crop production control programmes were mainly concentrated on allocative efficiency. Yet, there is no doubt that the government interference would also affect farmers' TE. To fill this discrepancy, the purpose of this study has been to relate government crop production control programmes to the farmers' TE.

The deterministic frontier production function approach was applied to estimate the production parameters and to derive measurements of the farm-specific Farrell TE for Egyptian farms. The Gamma frontier appeared to be a superior alternative specification because it offered statistical efficiency gains over the average OLS specification.

Evidence of the impact of government interference on TE is abundant. First, the distribution of TE among crops under different policy regimes can be characterised as that the most free-market oriented crop (corn) had the highest variance and the lowest mean and the most tightly controlled crop (cotton) had the highest mean and the lowest variance. It is because that some innovative corn growers motivated by the free-market system are quicker than others in acquiring new technological information about the less controlled crop. Thus, wider spread of TE among corn farmers was observed. Second, corn growers were found to benefit more from formal education and extension contact than rice or cotton growers. Finally, the forced delivery system on rice was found to have significant and negative effect on TE of rice growers.

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APPENDIX

The production data used in this study is a subset of the data that was collected during the 1982-83 season by interviewers associated with the "Economic Efficiency Activity", USAID/ADS-Egypt project. The sample size is 168 farms in the Nile Delta rice zone producing at least some production of corn, rice or cotton. A listing of the variables used is presented here.

Variable used in the estimation of equation (2) are

- (1) yields measured in kg,
- (2) land input measured in feddan,
- (3) seed quantity measured in kg,
- (4) labor measured in man-days,
- (5) machinery power measured in machine hours,
- (6) nitrogen fertilier measured in kg (in actual ingredient).

Variable used in the estimation of equation (3) are

- (1) AGE measured age of the head of the household in years,
 - (2) EDU1: 1 if the head of the household had only elementary school education, 0 otherwise;
 - (3) EDU2: 1 if the head of the household had received some kind of high school diploma, 0 otherwise;
 - (3) EXT: 1 extensive extension contact; 0 little extension contact,
 - (4) EDEX1: EDU1 times EXT (to show the effect of the interaction between elementary school education and extension contact),
 - (5) EDUX2: EDU2 times EXT (to show the effect the interaction between high school and extension contact).
- A positive interaction term indicates complimentarity between formal education and extension contact; a negative interaction term indicates substitutibility between the two.
- (6) LAB: ratio of the quantity of family labor over the quantity of total labor employed. A negative sign indicates the farm manager's ability to supervise a large hired labor force and, thus, laying the basis for that farm to be more technically efficient.
 - (7) FRMK (free market): the ratio of revenues from free market sales to the total value of output. This variable is only for the rice function because rice is the only studied crop with free market sale and delivery quota. It is hypothesised to have a positive sign.
 - (8) Crop area and farm size are included to examine their effects on the farmer's technical efficiency.

OPTIMAL PROMOTION FOR AGRICULTURAL MARKETING AGENCIES

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SUMMARY

This paper investigates optimal promotion strategies in alternative market segments under both monopolistic supply conditions, where an optimal output decision is made by the agency, and under competitive supply conditions, where the output decision is determined by market forces.

Existing promotion models appropriate for an institution operating in a single market under either of these supply conditions are reviewed. These models of optimal promotion are then extended to incorporate multiple market segments with:

- (a) optimal pricing in segments and monopolistic supply features;
- (b) uniform pricing across segments and competitive supply features;
- (c) optimal pricing in segments and competitive supply features.

The prescriptions for optimal promotion strategies which emerge from these models are then compared with each other and with those which emerge from models which assume a single market.

Key Words: Promotion, Pricing, Supply Response, Market Segments

INTRODUCTION

In recent years, marketing institutions operating in New Zealand's agricultural export sector have placed increasing emphasis on market segmentation strategies as an economic instrument. When attempting to segment markets for agricultural products, such institutions are faced with the problem of how much product to allocate to individual market segments, and what pricing and promotion strategies to adopt in each of

these segments. The prescriptions of economic theory can assist in these tasks, by indicating optimal strategies for a particular marketing agency objective.

There has been a great deal of discussion on optimal advertising behaviour in the literature. Much of it is based on the study by Dorfman and Steiner (1954) who derived the optimal advertising decision for a profit-maximising monopolist who operates in a single (aggregate) market. In the general economics literature, this theorem has been extended to include oligopolistic market structures (Lambin, 1976), and from its static formulation to include the dynamics of the sales response to advertising (Nerlove and Arrow, 1962). In the agricultural economics literature, studies which are based on this theorem include Ward (1975), de Boer (1977) and Strak (1985). The latter two authors extended the Dorfman-Steiner result by attempting to incorporate the behaviour of a monopolist in more than one market segment. However, Strak (1985) incorporated administered pricing features into his version of the model, whereas some of the analysis used by de Boer (1977) warrants further attention. Therefore, an investigation of optimal advertising behaviour by an agricultural marketing agency which has the power to restrict output and to direct product to alternative market segments is warranted.

The Dorfman-Steiner theorem and its derivatives assume that a marketing institution has the power to adjust the level of producer output to a profit-maximising level. However, in the majority of agricultural industries, this condition does not apply. Agencies which operate collectively on behalf of producers may be able to exert monopoly power in the market segments in which they operate. However, in general, they do not have the power to restrict output by producers. Therefore, when producers receive higher returns from demand management strategies in the form of a pool price, they may respond by increasing output accordingly. Unlike the monopoly case, where the output decision is optimised in conjunction with the promotion decision, output is determined competitively in this situation.

Nerlove and Waugh (1961) recognised these supply side differences between a monopolist and a typical agricultural marketing agency, and they extended the Dorfman-Steiner theorem to incorporate these features. The Nerlove-Waugh extension to the Dorfman-Steiner theorem has been utilised or referred to extensively in subsequent analyses of optimal advertising behaviour in agricultural industries (Tisdell, 1976; de Boer, 1977; Thompson and Eiler, 1977; Strak, 1985, Quilkey et al, 1986).

Because the Nerlove-Waugh theorem of optimal advertising incorporates the appropriate supply-side features, it is a considerable improvement over the earlier Dorfman-Steiner theorem as a benchmark against which to evaluate the appropriateness of promotion activity in agricultural industries. Unfortunately, the prescriptions of the model in an unmodified form apply only to an agency which operates in a single (aggregate) market. Attempts have been made to extend the theorem to more than one market segment. However, such studies tend to have specific pricing or supply features. For example, Thompson and Eiler (1977) considered two market segments with administered pricing features and advertising in one of these segments only. On the other hand, Quilkey et al (1986) assumed a single (uniform) price in two market segments, and considered optimal advertising behaviour in each segment, given a fixed level of supply to be allocated between these segments. As such, these extensions to the Nerlove-Waugh model are of limited usefulness when attempting to prescribe optimal advertising behaviour by agencies operating in the context of New Zealand's agricultural export markets.

This paper investigates optimal promotion strategies in alternative market segments. Three models are presented. The first model extends the Dorfman-Steiner theorem to include optimal advertising behaviour in two market segments by a profit-maximising, price discriminating monopolist. The second model extends the Nerlove-Waugh theorem to include optimal advertising behaviour by an agency which operates in more than one market segment, but does not have the power to reallocate output between segments, nor to control the aggregate level of output. The final case considered, which is also a Nerlove-Waugh extension, incorporates optimal pricing behaviour by an agency which has the power to reallocate output between two alternative segments, but not the power to control the level of output supplied to it.

The remainder of the paper is structured as follows. The next section reviews the derivation and results of the Dorfman-Steiner and Nerlove-Waugh models, while the following section presents the above extensions to these models. In the final section, the prescriptions for optimal advertising behaviour which emerge from the base models and their extensions will be summarised.

CONVENTIONAL STATIC MODELS OF OPTIMAL ADVERTISING

Dorfman and Steiner (1954) considered optimal behaviour by a monopolist in one (aggregate) market, where the decision variables available to the firm are price or

output, and advertising. In this case, demand, Q , is given by

$$Q = Q(P, A) \quad (1)$$

where P and A are price and advertising respectively. The profit function, Π , is

$$\Pi = PQ(P, A) - C(Q) - A \quad (2)$$

where $C(Q)$ is the total cost of producing output Q .

When this profit function is maximised, it yields the optimal advertising decision rule

$$\theta = \beta \left[\frac{P - MC}{P} \right] \quad (3)$$

where θ is the advertising to sales ratio, $A/(PQ)$, β is the advertising elasticity of demand, and MC is marginal cost. The corresponding product-price decision rule is given by

$$\left[\frac{P - MC}{P} \right] = 1/\eta \quad (4)$$

where η is the price elasticity of demand (absolute value). This is the familiar profit-maximising rule where marginal cost equals marginal revenue.

These optimal product-price and advertising decision rules can be expressed in a single relationship which encapsulates both rules as follows.

$$\theta = \beta/\eta \quad (5)$$

Equation (5) has become known as the Dorfman-Steiner theorem, and is appropriate for a monopolist operating in a single market, which includes a marketing agency concerned with aggregate demand and with the ability to control output.

Nerlove and Waugh (1961) recognised that typical agricultural marketing agencies do not have the power to restrict output to profit-maximising levels. That is, the advertising problem faced by such institutions is how to determine the optimal advertising decision given that suppliers have the ability to respond to increasing returns from this activity by increasing output. Consequently, they amended the Dorfman-Steiner theorem of advertising in one (aggregate) market to include this feature. In a simplified version of their model, demand, Q , is given by

$$Q = Q(P, A) \quad (6)$$

and supply can be represented by

$$S = S(P) \quad (7)$$

where S is the output supplied at price P . The profit function to be maximised then becomes

$$\Pi = PQ(P,A) - C(S(P)) - A \quad (8)$$

where $C(S)$, the aggregate cost of production is the area under the supply curve to the left of S . However, this profit function must be maximised subject to the constraint that excess supply is zero. That is,

$$Q(P,A) = S(P) \quad (9)$$

The solution to the Nerlove-Waugh model yields the following advertising decision rule

$$\theta = \frac{\beta}{\eta + \epsilon} \quad (10)$$

where ϵ is the price elasticity of supply and other variables are as defined for the Dorfman-Steiner model.

A comparison of the Dorfman-Steiner and Nerlove-Waugh models indicates that the optimal advertising intensity will be lower in the latter case where demand and advertising elasticities are identical at the optimum in both situations. That is, all else being equal, agricultural agencies which do not have the power to control industry supply should advertise less intensively than such agencies which have this power and which then restrict output to monopoly profit-maximising levels.

OPTIMAL ADVERTISING IN TWO MARKET SEGMENTS

An Extension to the Dorfman-Steiner Theorem

Consider a monopolist who operates in two market segments, and must make decisions on how much advertising to allocate to each market segment, and what pricing policies to pursue in these segments.

In this case, demand in the i th market segment Q_i , can be written as

$$Q_i = Q_i(P_i, A_i) \quad (11)$$

where P_i and A_i are price and advertising respectively in the i th market segment. Aggregate demand then becomes

$$Q = Q_1(P_1, A_1) + Q_2(P_2, A_2) \quad (12)$$

The monopolist's profit function can be written as

$$\Pi = P_1 Q_1(P_1, A_1) + P_2 Q_2(P_2, A_2) - C(Q) - A_1 - A_2 \quad (13)$$

Now the firm has to choose values of P_1 , P_2 , A_1 and A_2 which will maximise profit. Maximisation of equation (12) with respect to these variables¹ yields the following optimal pricing rule for each segment.

$$MR_1 = MR_2 = MC \quad (14)$$

where MR_i is marginal revenue in the i th market segment.

That is, marginal revenues in each market segment are equated with each other and with marginal cost, which is the conventional pricing and output prescription for a profit-maximising price-discriminating monopolist.

Given this pricing behaviour, the optimal advertising decision in the i th market segment was found to be

$$\theta_i = \frac{\beta_i}{\eta_i} \quad (15)$$

where $\theta_i = \frac{A_i}{P_i Q_i}$, β_i is the advertising elasticity of

demand in the i th market segment and η_i is the price elasticity of demand (absolute value) in this segment.

Compare the intensity of advertising in each market segment. For this purpose, assume $\beta_1 = \beta_2$ and $\eta_1 < \eta_2$. Therefore,

$$\theta_1 > \theta_2 \quad (16)$$

That is, more (less) advertising effort, as measured by the advertising to dollar sales ratio, should be directed to the less (more) price elastic segment when advertising elasticities are identical in each segment. However, if $\beta_1 < \beta_2$, as empirical evidence seems to suggest (de Boer, 1977), then it is not possible to determine whether relatively more advertising effort should be directed towards one particular market segment.

In effect, this extension to the Dorfman-Steiner theorem indicates that the decision rule of the base

1. Proofs to the equations presented in this model are available from the authors on request.

model should be applied in each segment, with segments being linked by the optimal pricing rule.

An Extension to the Nerlove-Waugh Theorem - Uniform Pricing

Consider optimal advertising behaviour by an agency which operates in more than one market segment, but does not have the power to reallocate output between segments, nor to control the aggregate level of output. That is, price is determined by the intersection of the aggregate demand curve with the supply curve, and this price is uniform in all market segments. Proofs to solutions derived in this model may be found in Martin (1985).

In this case, demand in market segment i is given by

$$Q_i = Q_i(P, A_i) \quad (17)$$

and aggregate demand by

$$Q = Q_1(P, A_1) + Q_2(P, A_2) \quad (18)$$

Supply is represented by

$$S = S(P) \quad (19)$$

The profit function to be maximised is given by

$$\Pi = P(Q_1(P, A_1) + Q_2(P, A_2)) - C(S(P)) - A_1 - A_2 \quad (20)$$

subject to the constraint that

$$Q_1(P, A_1) + Q_2(P, A_2) = S(P) \quad (21)$$

In this case, optimal advertising effort in market segment i , is given by

$$\theta_i = \frac{\beta_i}{\eta + \epsilon} \quad (22)$$

When compared to the Nerlove-Waugh model itself, this particular extension indicates that the optimal ratio of advertising to sales generated in a particular market segment is identical to that for the Nerlove-Waugh theorem with the exception that the aggregate advertising elasticity of demand is replaced by the advertising elasticity in the relevant market segment.

The relative direction of advertising effort between the two segments can be given by the following ratio.

$$\frac{A_1/Q_1}{A_2/Q_2} = \frac{\beta_1}{\beta_2} \quad (23)$$

That is, the ratio of advertising per unit sales in one market segment to that in the other market segment is equal to the ratio of the corresponding advertising elasticities.

An Extension to the Nerlove-Waugh Theorem - Optimal Pricing

Although the above model extends the Nerlove-Waugh theorem to consider a number of market segments, it abstracts from optimal pricing policies which such an institution might pursue when it has the power to control the allocation of industry output among alternative market segments. Such a model is now considered and the proofs to solutions presented in it may be found in Martin et al (1986).

In this case, demand is represented by

$$Q = Q_1(P_1, A_1) + Q_2(P_2, A_2) \quad (24)$$

and supply by

$$S = S(R) \quad (25)$$

where R is the return per unit of output, or pool price, received by the producer. This return is given by

$$R = \frac{P_1 Q_1(P_1, A_1) + P_2 Q_2(P_2, A_2)}{Q_1(P_1, A_1) + Q_2(P_2, A_2)} \quad (26)$$

The profit function to be maximised is

$$\Pi = P_1 Q_1(P_1, A_1) + P_2 Q_2(P_2, A_2) - C(S(R)) - A_1 - A_2 \quad (27)$$

where $C(S)$ is defined as for the Nerlove-Waugh model.

As with the Nerlove-Waugh case, the marketing agency is constrained to adopt policies such that it sells all the output supplied when producers receive the average return, R . That is,

$$Q_1(P_1, A_1) + Q_2(P_2, A_2) = S(R) \quad (28)$$

Maximisation of (27) with respect to P_1, P_2, A_1 and A_2 subject to (28) yields the following decision rules.

Firstly, the optimal pricing decision is given by

$$MR_1 = MR_2 \quad (29)$$

That is, prices in the two market segments are set so as to equate the marginal revenue from selling in each market. Thus, the conventional rule of the price-discriminating monopolist for allocating output to market segments should be maintained, even though the marketing agency is required to sell all output supplied to it. However, the marginal revenues in these individual market segments are not required to equal the marginal cost of production, and hence, the profit-maximising monopoly level of output is not produced.

Given this pricing policy, the optimal advertising in a particular market segment i is given by

$$\theta_i = \frac{\beta_i}{(\eta_i + \epsilon) - \eta_i(1 + \epsilon)(1 - \frac{R}{P_i})} \quad (30)$$

where θ_i is defined as the ratio of advertising in market segment i to producer returns from that segment (A_i/RQ_i).

Following the convention that $\eta_1 < \eta_2$, then (30) implies that

$$\theta_1 > \frac{\beta_1}{\eta_1 + \epsilon} \quad (31a)$$

and

$$\theta_2 < \frac{\beta_2}{\eta_2 + \epsilon} \quad (31b)$$

Compare the advertising decisions which emerge from this model with that suggested by the base Nerlove-Waugh model. In this situation, relatively more (less) advertising effort (as measured by the advertising to producer returns ratio) would be directed to the less (more) price elastic market segment than would be the case if this was the only market faced by the agency.

The advertising prescriptions which emerge from this model can also be compared with those which result from the uniform pricing extension to the Nerlove-Waugh model. By recalling that $\eta_1 < \eta_2$, and considering (30), it is possible to determine that

$$\frac{A_1/Q_1}{A_2/Q_2} > \frac{\beta_1}{\beta_2} \quad (32)$$

That is, the ratio of advertising per unit sales in the less price elastic market to that in the more price elastic market exceeds the ratio of the corresponding advertising elasticities. However, equation (23) indicates that where pricing is uniform across market segments and market determined, then the ratio of advertising per unit sales in one market segment to that in the other market segment equals the ratio of the corresponding advertising elasticities. That is, under optimal pricing, relatively more (less) advertising effort (as measured by advertising per unit sales) is directed to the less (more) price elastic market segment than under uniform pricing across these segments. This result makes intuitive sense, since relatively more advertising effort is directed to the less price elastic segment where the potential to exploit monopoly power through discriminatory pricing is greater.

CONCLUSIONS

The advertising decision rules which result from the above models are summarised in Table 1. Factors which influence the magnitude of optimal advertising intensities include advertising elasticities of demand, price elasticities of demand and supply, and, in one case, the ratio of the pool price received by producers to the price charged in an individual market segment. The combination of factors which determine optimal advertising intensities varies according to the model under consideration.

The following conclusions on the comparative magnitude and direction of advertising effort which emerge from these models are as follows.

- (a) A marketing agency which operates in a single (aggregate) market, and which does not have the power to control the level of industry output should advertise less intensively than an agency which has this power (Nerlove-Waugh c/f Dorfman-Steiner).
- (b) Where a marketing agency operates in two market segments and has the power to control and reallocate industry output, the optimal advertising decision in each market segment is similar to that for an aggregate market where an agency has similar powers. However, the advertising and price elasticities of demand appropriate for the individual market segment are utilised, rather than aggregate elasticities (Dorfman-Steiner c/f Dorfman-Steiner Extension).

Table 1: Optimal Advertising Decisions for a Single Market and Two Market Segments under Alternative Supply and Pricing Assumptions

		One Aggregate Market	Two Market Segments
Optimal Output		Dorfman-Steiner	
	One Price	$\theta = \frac{\beta}{\eta}$	-
	Discriminatory Pricing	-	Dorfman-Steiner Extension $\theta_i = \frac{\beta_i}{\eta_i}$
Supply Response		Nerlove-Waugh	Nerlove-Waugh Extension
	One Price	$\theta = \frac{\beta}{\eta + \epsilon}$	$\theta_i = \frac{\beta_i}{\eta_i + \epsilon}$
	Discriminatory Pricing	-	Nerlove-Waugh Extension $\theta_i = \frac{\beta_i}{(\eta_i + \epsilon) - \eta_i(1 + \epsilon)(1 - \frac{R}{P_i})}$

(c) An agency operating in two market segments which has the power to institute optimal pricing policies and to restrict output to optimal levels, should advertise more intensively in the less price elastic segment when advertising elasticities in both segments are equal (Dorfman-Steiner extension).

(d) Where an agency does not have the power to restrict industry output or to reallocate such output between market segments, the optimal advertising decision in each market segment is similar to that emerging for an aggregate market under similar assumptions. In the former case, it is appropriate to consider the advertising elasticity of demand in the individual segment, whereas in the latter case, the aggregate advertising elasticity is of significance (Nerlove-Waugh c/f Nerlove-Waugh (uniform pricing) Extension).

(e) Where an agency does not have the power to restrict or reallocate industry output, it should direct advertising effort in a manner such that the ratio of advertising per unit sales in one market

segment to that in the other market segment is equal to the ratio of the corresponding advertising elasticities (Nerlove-Waugh (uniform pricing) Extension).

(f) Where a marketing agency has the power to reallocate output between market segments, but cannot control the level of industry output, relatively more (less) advertising effort should be directed to the less (more) price elastic segment than would be the case if this was the only market faced by the agency (Nerlove-Waugh c/f Nerlove-Waugh (optimal pricing) Extension).

(g) Where an agency has the power to reallocate industry output, but not to control the level of this output, then the ratio of optimal advertising per unit sales in the less price elastic market to that in the more price elastic market exceeds the ratio of the corresponding advertising elasticities (Nerlove-Waugh (optimal pricing) Extension).

(h) Where an agency does not have the power to control the level of industry output, then under optimal pricing, relatively more (less) advertising effort should be directed to the less (more) price elastic segment than under uniform pricing across these segments (Nerlove-Waugh (optimal pricing) Extension c/f Nerlove-Waugh (uniform pricing) Extension).

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**COUNTERVAILING POWER REVISITED
Agricultural Bargaining Applied to the
New Zealand Setting**

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SUMMARY

Agricultural bargaining, the need for it in the New Zealand food system, and benefits resulting from it, are addressed in this paper. Countervailing power, as a mechanism for economically weak groups to achieve economic strength is reviewed. The bargaining group's ability to substantially raise the level of prices received by producers is often limited by legislative and economic factors. However, many non-price aspects of producer-processor relationships that impact net returns to producers can be improved through bargaining. The requirements for effective bargaining activity include: recognition by processors, the carrying out of market intelligence activities, maintaining member loyalty, and understanding the economics of the product and market place.

Key Words: Countervailing Power, Bargaining, Commodity Price.

INTRODUCTION

New Zealand is moving toward a more liberalised economy, where decisions about what will be produced and what prices will be received are shifted from the aegis of government (via regulation, support prices, etc) to a free market mode. How the economic pie is to be sliced has become a major issue. Producers must consider bargaining associations as a possible means of forming "equal" power blocs for this decision-making process.

The purpose of this paper is to examine bargaining in the context of providing countervailing power, the agricultural bargaining experience in other countries, and the benefits and shortcomings of bargaining.

**COUNTERVAILING POWER AND THE
NEW ZEALAND FOOD SYSTEM**

With increasing concentration in both the agricultural processing and input sectors, as evidenced by recent mergers, the imbalance in market power between producers and the parties

to whom they sell, and from whom they buy, continues to grow. Additional forces calling for a new method of price discovery are the voiced dissatisfaction with the schedule system of meat pricing, and the beginnings of forward contracting in the lamb industry. The forward contracting is largely motivated by processor need to specify raw material quality and delivery timing. All of the above are occurring in a context where current producer market power is nil.

As New Zealand's economic policy pendulum swings toward liberalisation, reliance on the laissez-faire model is going to result in the weak party being impinged upon by the more aggressive economic powers. If, as in Galbraith's words, "unrestrained economic power is the enemy of a good society", the question is how this exploitation can be checked.

It is argued that an important activity of the State is to nurture countervailing power. For, in the absence of countervailing power, more governmental control or planning is sought and the economy's capacity for autonomous self-regulation is reduced (Galbraith, 1952).

It is interesting to note Galbraith's 1952 caveat regarding government's willingness to foster countervailing power,

"Not until farmers and workers achieved some organization on their own behalf were they able to get the state to reinforce their efforts.... Support to countervailing power is not endowed, ad hoc, by government. It must be sought" (Galbraith, 1952).

Perhaps the April Farmers demonstration in Wellington is the beginning of a real effort by producers to seek governmental assistance in obtaining market power. The choices for government appear to be rather clear: (1) Direct intervention through price smoothing (support) schemes, SMP's or other industry protectionist measures - tariffs; (2) dissolving the power of those who have it (preventing, for example, the Wrightson-Dalgety Crown merger); or, (3) fostering through the appropriate legislative framework, a mechanism(s) by which the weak position of producers can be strengthened.

An interesting aspect of Galbraith's original hypothesis was that his defence of countervailing power was not maximization of consumer welfare, i.e. lowest possible price for goods and services. As he explains at a later date (Galbraith, 1954):

"I doubt whether, in entering a defence of the social utility of countervailing power, I made sufficiently clear whether my standard was the welfare of the consumer or the minimization of social tensions.... This is I submit also the crucial test. American society has not recently been threatened in peacetime (or even in wartime) by a shortage of food. There have been times when the tensions of the farming community were a threat to orderly democratic process."

Certainly New Zealand is currently experiencing social tensions in the agricultural community, where declining incomes are accompanied by rapid changes in the market, both in the domestic and international scene. The process of bargaining could, then, contribute to a healthier environment for the transformation of New Zealand's agricultural marketing institutions.

BARGAINING BENEFITS

While producer price improvement is the commonly stated objective of commodity bargaining, a number of other ancillary, but important non-price issues can be resolved. In the U.S., fruit and vegetable bargaining associations negotiate on a wide range of items in addition to price. These include quality measurement systems (grading), delivery schedules, how by-passed acreage is to be allocated to growers, and rights and responsibilities of producer and processor during production.

In many situations the responsibility for a cost item is shifted from producer to processor, who is in a better position to minimize joint costs. As an example, in the 1970's pea growers in Washington State were being docked for split and damaged peas, although the processor owned and operated the combine. Through bargaining, the incentive to control damage was placed on the processor rather than penalizing the grower, who had no control (Lang, 1980).

The New Zealand contract grower is faced with similar problems. One example: the processor supplies the harvesting equipment, but it is subject to frequent breakdown. Thus harvest schedules are delayed and tenderometer readings increase, lowering the price paid and returns to growers. In an atmosphere of "good-faith" bargaining, important non-price issues such as these can be resolved, resulting in less tension and antagonism between producer and processor.

But more important, bargaining can pressure oligopolistic industries to remove what Cyert and March refer to as "organizational slack" (Cyert and March, 1963). Organizational slack is the degree to which firms do not follow conventional economic theory and maximize net revenue in the face of given prices and a technologically determined production function. The main thesis is that in most large organizations various payments are being made in excess of what is required to maintain the organisation: stockholders' dividends in excess of those required to keep them loyal; wages in excess of the level necessary to maintain labour; excessive services and luxuries for executives; and so forth. For example, in the early 1980's American auto workers, when faced with job losses due to foreign competition and recession, agreed to lower wage rates and hither to "unacceptable" changes in working conditions.

Some process crop growers argue that certain fungicide and pesticide applications required by processors are either ineffective or unnecessary. However, company management insists on them for cosmetic purposes or, in some instances, to protect themselves. During bargaining, information can be gathered and brought to the table that results in a more reasoned decision as to whether such joint costs are necessary. Net producer income is influenced by many factors in addition to price; uniform and fair quality standards, market reliability, and harvest coordination are all examples of non-price items that can be goals of bargaining.

As to the issue of improving prices, the evidence is sketchy but leads one to the conclusion that over the long run, slight gains, at best, can be achieved through producer group bargaining. This is particularly true if a production control mechanism is not in place. Studies from the U.K. show moderate gains of two to seven per cent, as a result of bargaining activities (Baron, 1978). In the U.S., most bargained commodities are not subject to production controls. Also a relatively obscure and, until the past decade, little noticed section of the Capper-Volstead Act prohibits cooperatives from carrying out activities that result in "undue price enhancement". So while Capper-Volstead provides the legal framework for cooperative activity, this ill-defined section (no definition of undue price enhancement has been agreed upon) of the same act has kept bargaining cooperatives in a quandary as to how much economic power they could legally exert.

REQUIREMENTS FOR EFFECTIVE BARGAINING

What is required for a commodity bargaining group to be effective?

Recognition - First and foremost the bargaining organization must be recognized by processors as the exclusive bargaining agent and source of supply for the product. Recognition can come in one of two ways: voluntary, or mandated by government. In the case of voluntary recognition, the bargaining organization must not only control the majority of production, but exercise member discipline, so that the producer delivers on his end of the contract and the bargaining agent then is legitimized in the eyes of the processor. Nothing will destroy a bargaining organization faster than having members non-perform on their delivery contracts. While such contracts may be enforceable in court, such enforcement becomes a moot point if in the meantime the credibility of the bargaining association is destroyed (Knutson, 1972).

The only US attempt at developing a law that mandated agricultural bargaining was the Michigan Agricultural Marketing and Bargaining Act, passed in 1972. This law set up a system whereby grower associations, once certified by the State,

were to act as exclusive bargaining and marketing agents for all producers in a bargaining unit. The law read much like industrial relations laws governing collective bargaining between labour and employers. The Michigan Act required bargaining in good faith; growers did not have to join the bargaining association, but were bound by the terms of the contract negotiated and had to pay fees to the association for services rendered. The law prevented handlers from negotiating with growers, whether they were members of the unit or not, and the act provided for mediation of issues and, as a last resort, binding arbitration of unsettled issues (Bunge, 1980).

The Michigan Act almost immediately was challenged in the courts on constitutional grounds by processors and individual producers disgruntled with the restrictions the Act placed on their individual actions. The court test ultimately ended up in the United States Supreme Court; the Act was struck down on June 12, 1984, in an opinion that the law conflicted with federal law permitting farmers to organize, but prohibiting coercion of any farmer to join (Wall Street Journal, 1984).

Market Intelligence and Strategy - A prerequisite for success at the bargaining table is market intelligence. Data on product supply, such as costs of production, where produced, and comparative costs of production in various regions, and processor ability to substitute sources of supply must be ascertained. Likewise, on the demand side, information such as consumption trends, factors affecting consumption, and processor profit margins on the product are a few examples of the type of information needed.

To negotiate from a position of power, the bargaining association must know more about its product than anyone else. All of this is used to develop a bargaining strategy; success will not come from going to the bargaining table and merely demanding a higher price. Bargaining for price increases must be justified both in the context of the short-run and the long-run economic situation.

Member Discipline - Bargaining association member loyalty is best achieved by the association's success at the bargaining table. With success, members become vocal supporters and non-members are encouraged to join.

For the long-term effort, most bargaining associations establish marketing contracts with their members. Through the contract, producers have a legal obligation to deliver production to the association. However, as discussed earlier, grower contracts do not guarantee the ability of associations to hold membership.

Member loyalty and trust can best be nurtured by an effective member communication and education programme. Most associations have field representatives whose major responsibilities are not only to bring non-members into the fold, but to keep

members informed on market developments and bargaining activities, so that they are not informed via "surprise" announcements in the media.

It is imperative that producers take the view of evaluating the bargaining association over its long-term performance record, rather than on the basis of any particular year. For in any given year the bargained price may not be the most attractive at harvest.

A persistent problem for bargaining associations is the non-joiner "freeloader". In the absence of legislation establishing legal recognition of bargaining entities, and where non-members as well as members are bound by the terms of the contract (as in the now voided Michigan Act), there always exist incentives for producers not to join. Incentives result because the nonmember can frequently share in the benefits of bargaining without sharing the costs, and processors may write sweetheart contracts with nonmembers to weaken the bargaining association's position.

Economic Considerations

How much the producer price situation can be improved by bargaining is, for the most part, determined by the degree of competition among buyers and by elasticities of demand. First, one must recognize that producers are limited to bargaining with those to whom they sell (First Handlers). Thus, if the "fat" in the system is further up the channel of distribution, and, presuming in this case the first handler sector is competitive, the amount producers can expect to gain is limited by the first handlers' ability to obtain "fat" from others (Moore, 1968).

A product with inelastic demand characteristics would find processors in a favourable position to pass on cost increases. Also, wherever large value is added to the product and raw material costs are a small proportion of the processor selling price, it is easier for the processor to absorb increased raw material costs. For example, in a product where raw material cost of final product is 10 percent of final price, a 20 percent increase in raw material cost will result in only a 2 percent increase in price.

However, for the long-run viability of a bargaining effort, the issue is supply control. For, as producer returns are improved, output will tend to expand. Then associations must grapple with surpluses that can only be controlled through industry-wide government or quasi-government programmes, such as marketing orders.

In summary, the extent of monopsonist or collusive oligopolistic behaviour will determine the benefits that accrue from bargaining. If pre-bargaining prices have been kept substantially below levels that would be expected with purely

competitive behaviour, it is possible that price determination in a bargaining environment can result in an outcome where: (1) all sellers receive a higher price, (2) Sellers are able to sell more product, and (3) the buyers make at least normal profits (Helmberger and Hoos, 1963).

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ASSISTANCE TO THE TOURIST INDUSTRY

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SUMMARY

Measurement of the Effective Rate of Assistance to an industry requires a documentation of the assistance to that industry. This paper defines the "Tourism" sector and then (where possible) quantifies the assistance given. Legislation which affects tourism is examined, and the effects of taxicab and International airline regulations are documented. Direct subsidies in the form of both central and local government expenditures are quantified.

Key Words: Tourism, Assistance, Legislation, Subsidies.

As part of the governments continuing review of the economy in particular the levels of assistance required by various sectors of the economy this study given to the tourism sector in New Zealand. The measurement of the effective rates of assistance is a relatively new concept but has recently become accepted as a comparative analysis tool. It allows the different sectors of othe economy to be compared on an equal basis.

The theory behind the effective rates of assistance measurement is relatively simple in that it measures assistance given to the added value of an industry's output. In doing so it captures all assistance in inputs (both domestically produced and imported) and assistance on output and also the support given to other sectors whose goods are used in the industry under scrutiny. The ERA can be described as 'a measure of net assisance delivered (in cents) for each dollar contribution an industry makes to GDP at world prices', (Moore, 1984).

This study is to form part of an economy wide review of assistance levels presently being carried out by Syntec. This is to be the second measurement of the ERA for the tourism industry in New Zealand, following Moore (1984).

Identification and quantification of the various subsidies (and taxes) that apply to the tourism industry is a major aspect of the ERA calculation. Details of various incentives and depreciation allowances which apply to the tourism industry are given in a publication by the Tourist and Publicity Department.

However there are other major areas where quite substantial amounts of Government spending can be assumed to be as assistance to the tourism sector. For example, the loss the NZR incurs, part of the Votes of Tourist and Publicity, Lands and Survey and, the NZ Forest Service.

There are also cases where the regulatory environment affects the tourism sector. Examples include the question of International airline landing rights, the shop trading hours regulations, the law governing duty free shops and liquor and gambling licences. Although it may not be possible to quantify here, all these items, recognition of their effect on the tourism industry in New Zealand is a first step towards that quantification.

The objective of this paper is to identify, and where possible, quantify assistance to the tourist industry. This will be addressed in two sections:

- (1) Legislation affecting the tourist industry;
- and (2) Subsidies to tourism;

Components of the tourism sector will be identified and quantified in later research. Taxation and other incentives applicable to the tourist industry will also be addressed in later research. Thus, the present paper is concerned with the identification of the tourism industry and the assistance to the industry.

THE TOURIST SECTOR

One of the main priorities in an analysis of the tourist industry is to define the sector "Tourism". A dictionary definition of "tour" is "Pleasure journey, including stops at various places and ending where it began ...". this definition has been modified by Leiper (1979) to "It is the system involving the discretionary travel and temporary stay of persons away from their usual place of residence for one or more nights, excepting tours made for the primary purpose of earning remuneration from points en route". Some definitions are broader. "The action and activities of people taking trips (to a place/s outside their home communities) for any purpose except commuting to work", (United States Senate, cited in Airey, 1985) and "Those aspects of leisure-time behaviour and their consequences which occur as a result of temporary trips away from the home environment and which are motivated exclusively by a concern for recreational matters". (Heeley, 1980). Both of these definitions cover all recreational activities conducted outside of the private home and are more liberal conceptual definitions.

Some confusion exists between a tourist and a visitor. In a recent publication on New Zealand Tourism an entire chapter (of 9 lines) is devoted to a definition of "visitor" without any mention of "tourism". An international visitor is "a person staying at least 24 hours in New Zealand for the purpose of leisure (eg. holiday or sporting) or business", while a domestic visitor is "a New Zealand resident travelling outside his or her usual residential area and spending at least one night away from home" (New Zealand Tourism: Issues and Policies, 1984). These definitions must include the entire accommodation section and almost all travel. A further definition commonly used.

"Visitor: any person visiting a country other than that in which he has his usual place of residence, for not more than one year, and whose main purpose of visit is other than following an occupation remunerated from within the country visited.

This definition coverse two classes of visitors: "tourists" and "excursionists" which are defined as follows:

Tourist: ie. visitors, as defined above, staying at Teast 24 hours, but not more than one year, in the country visited and the purpose of whose trip can be classified under one of the following headings:

- (a) pleasure, recreation, holiday, sport;
- (b) business, visiting friends and relatives, mission, meeting, conference, health, studies, religion.
(World Tourist Organisation, 1985)"

The above definition is unacceptable on one ground and confusing on another. The term "he has his usual place of residence" is blatantly sexist and would preclude many tourists to this country. Secondly, the exclusion of those "following an occupation remunerated from within the country visited" but including "business" is somewhat confusing. It is difficult to envisage as to why a person would travel on business unless some remuneration was expected to accrue, directly or indirectly, from the country visited. Excluding "business" from the overseas visitors reduces the international "tourist" sector to some 88 per cent of the international "travel" sector in New Zealand. Many problems remain with those persons (male or female) who attend a convention or business appointment and stay on for a few days.

Where possible the Leiper definition will be used in this study. Reinforcement of the exclusion of business travel is obtained from the opening sentence of Mathieson and Wall (1982) "Tourism is the temporary movement of people to destinations outside their normal places of work and residence" Tourists exclude those earning remuneration, and a broad view of "remuneration from within the country visited" is taken.

Within the tourist sector there are two sub-sets - International and Domestic tourists. Both groups contain some persons who combine earning remuneration with other activities, so a "grey" area exists between the business and non-business or tourist traveller. While one can make a theoretical differentiation between "business traveller" and "tourist", the practicalities as such are often a split is not possible. One further conceptual problem which arises with respect to domestic tourists is the impact of government policies at the margin on a New Zealander deciding between a holiday in New Zealand or overseas. Thus, some policies influence the Tourist Industry in a manner which is difficult to measure. Exchange rate overvaluation is an example of this, and the extent to which regulation increases International airfares may be another.

Another problem which arises with domestic tourism is the method of valuation. Roberts (1982) considers that incremental costs of the Tourism sector in the economy. However, Moore (1984, p11) defines domestic tourist expenditure while on holiday. We agree with Moore and total rather than incremental expenditure will be used for the domestic tourist sector.

SUBSIDIES TO TOURISM

1. Parks and Reserves - Central Government

The provision of National and Forest Parks is the responsibility of the Lands and Survey Department and the Forest Service. Most of these facilities are provided free of charge to users, be they New Zealanders or overseas visitors. This entails a substantial transfer of funds from tax payers to recreationists.

Estimates of the tourism related expenditure for both Lands and Survey and the Forest Service was obtained from the estimates of Government Expenditure. Additionally, estimates of the current expenditure which is likely to go to the Department of Conservation was obtained from Treasury. These data have an allowance for corporate services which is difficult to obtain from Government Expenditure estimates. Included in these later estimates is expenditure which is currently the responsibility of the Wildlife Department and the Historic Places Trust. Figures were obtained for the 1986/87 year, and these were derived from 1985/86 estimates. Earlier years were estimated by deflating by the CPI.

A major problem exists in allocation of funds to "tourism". One mandate of the Lands and Survey is conservation and we are fully cognizant of the determinants of benefit to both users and non-users of National parks from conservation and environmental protections. However, real money is spent in providing services to users of parks in general, and given the geographical location of most parks it would seem appropriate to allocate these expenditures to tourism. The note is made that some conservation spending and all users of parks, both day-trippers and overnight "tourists" are included in this definition of tourism subsidies.

Estimates were obtained as follows:

Table 1: Central Government - Expenditure on Parks
A. (From Government Expenditure) (\$/m)

	Year				
	81/82	82/83	83/84	84/85	85/86
National Parks and Reserves (Lands and Survey)	15.74	17.47	23.30	25.94	22.63
Forest Service	9.50	8.87	11.00	11.60	15.76
TOTAL	25.25	26.34	34.30	37.54	38.39

Note: excludes Wildlife Department and Historic Places Trust

While much of the benefits are enjoyed by residents of Christchurch, it is also true that many benefits are enjoyed by tourists. Estimates of the tourism component were placed at 25-30% by the City Council, and this would equate to some \$2.5 for the 1985/86 year. From these estimates it would not seem unreasonable to assign a value of \$10.0m nationally as the subsidy from local government to tourism in New Zealand. Earlier years, discounted by the CPI are as follows:

Table 4: Local Government Subsidy to Parks

Year	Ratepayers Subsidy (Parks & Reserves) \$m
1985/86	10.00
1984/85	9.16
1983/84	8.68
1982/83	7.36
1981/82	6.22

No attempt will be made to apportion between domestic and overseas tourism, although it is likely that much of the subsidy is domestic.

3. Accident Compensation Corporation

Overseas visitors to New Zealand are covered by Accident Compensation paying for medical and related costs resulting from accidents. Information obtained from the ACC in Wellington indicated the following costs were incurred by overseas visitors and borne by ACC.

Table 5: A.C.C. Subsidy to Tourism

Year	1981/82	1982/83	1983/84	1984/85	1985/86
Amount (\$m)	.238	.206	.248	.240	.232

Hospital expenses not relating to accidents are billed to visitors at commercial rates. Any further subsidy would be in the nature of problems with appropriate pricing policies or bad debts incurred.

Table 2: Central Government - Expenditure on Parks
B. (Estimates from Treasury) (\$m), 1986/87

	1986/87 Year
National Parks and Reserves	32,049
Forest Service	27,275
Wildlife	7,921
Historic Places	1,319
Less Recovery	-3,570
TOTAL	64,994

Deflating these figures by 10% for 1985/86 and the CPI for previous years provided the following estimates of expenditure:

Table 3: Central Government Expenditure
on Parks (From Table 2)

	\$m	% increase from A
1981/82	33.457	33
1982/83	38.946	48
1983/84	44.978	31
1984/85	51.863	38
1985/86	54.560	42

Note: These include Wildlife Department and the Historic Places Trust. Also, the assumptions are made about expenditure in real terms (CPI deflation) and cost recovery.

These estimates from B will be used, and referred to as DOC expenditure for convenience.

2. Parks and Reserves - Local Government

As well as Central Government spending in this area a considerable amount of ratepayers money is spent by local authorities. An estimate was obtained from Christchurch City Council of expenditure by the Parks and Reserves Department. For the year ending 1986, a total of \$13.8m was spent, with a budget loss of \$7.8m. Specific examples include \$2.2m on QE.II Park with a recovery of \$1.1m and \$1.2m on the Botannical Gardens with a \$49,000 recovery.

4. State Highway Funding of "Tourist" Roads

Many roads in New Zealand exist almost entirely for the benefit of tourists, be they New Zealanders or overseas tourists. An estimate of the allocation of funds for State Highways carrying predominantly tourist traffic was obtained from the Ministry of Works and Development. These estimates related to the 1985/86 year and were deflated by the Capital Expenditure Price Index to earlier years, this will be an indication only of earlier subsidies. The specific roads included (in descending order by amount spent in 1985/86) the Lumsden-Te Anau-Milford road, the Haast-Wanaka road and the Crown Range.

Table 6: Estimate of Roading Subsidy (1985/86 figures)

Year	1981/82	1982/83	1983/84	1984/85	1985/86
Amount on major tourist roads (\$m)	4.21	5.10	5.47	5.80	6.32

5. Chatham Island Air Service

Subsidies have been paid in recent years to both the Chatham Air Services and the Chatham Shipping Service. For the 1984/85 year, these amounted to \$0.423m and \$1.961m respectively. Allocation of the tourism component is arbitrary, but the air service component will be treated as tourism related and not the shipping services. The actual amounts paid have been:

Table 7: Chatham Air Service Subsidy

Year	1981/82	1982/83	1983/84	1984/85	1985/86
Amount (\$m)	.499	.543	.364	.367	.423

6. Railways Long Distance Passenger Loss

Explicit details on the subsidies to long distance rail passenger services have been available since the Railways became established as a Corporation. These amounts are available from the 1982/83 year onwards, and are as shown below. An estimate is provided for the 1981/82 year.

Table 8: Subsidies to Long Distance Rail Transport

Year	1981/82	1982/83	1983/84	1984/85	1985/86
Amount (\$m)	30.00 (estimated)	34.179	30.573	23.438	27.752

These subsidies do not include suburban rail transport. In the absence of any further details on the rail passengers this amount has been assigned to "tourism" as a subsidy. Should the Railways abandon all long distance passenger services, it is unlikely that all this "loss" would be recovered, therefore the subsidy is an overestimate.

7. Mountain Safety Council

Funds for this organisation come from Lottery Board Grants and from the Accident Compensation Commission. The following payments have been made:

Table 9: Mountain Safety Council

Year	1981/82	1982/83	1983/84	1984/85
Amount (\$m)	0.308	0.362	0.366	0.395

Although, once again, there is a large recreational component involved in mountain safety, the amount has been allocated to "tourism". Additional expenses from search and rescue operations are not included in these subsidies, and following the definition of "away from home for 24 hours" adopted, one could argue that they should be, albeit an involuntary stay away from home!

8. Tourist and Publicity Department and the Ministry of Foreign Affairs

The Estimates of Expenditure Publications were examined for the amounts allocated to the Tourist and Publicity Department. Allowance was made for the expenditure on the National Film Unit, National Publicity Studios and Information and Publicity Services (IPS - mostly press corp.).

Expenditure by the Foreign Affairs Department proved difficult to obtain. An estimate of 1985/86 actual tourism related expenditure of \$10.5m was provided to the Tourist and Publicity Department by Foreign Affairs. This was discounted by the CPI to earlier years, and an error term may result from this procedure.

Table 10: Direct Tourism Expenditure (Central Government)

Year	1981/82	1982/83	1983/84	1984/85	1985/86
T & P Department (\$m)	10.958	11.788	17.408	20.151	32.29
Foreign Affairs (\$m)	6.53	7.72	9.2	9.62	10.5
Total	17.488	19.508	26.60	29.771	42.79

Summary

These data are shown in Table 11 for the 1981/82 and 1985/86 years.

Table 11: Subsidies to the N.Z. Tourist Industry (\$m)

Subsidies	1981/82	1985/86
DOC	33.457	54.56
Local Govt	6.22	10.00
ACC	.238	.232
Roads	4.21	6.32
Chatham	.499	.432
L.D.R.S.	30.00	27.752
Mount. Safety	.308	.395
T & P	17.488	42.79
Sub-total	92.42	142.48

LEGISLATION AFFECTING THE TOURIST INDUSTRY IN NEW ZEALAND

This report considers 5 major areas where legislation may be acting as a constraint to tourism in New Zealand. These are:

- : the Shop Trading Hours Regulations
- : the International Airline Landing Rights Legislation
- : the regulations governing gambling in New Zealand
- : the liquor licensing laws
- : the restrictions on taxi licences

1. The Shop Trading Hours Regulations

Brief History

Prior to 1892 there was no legislation covering shop trading hours in New Zealand. By 1904, the Shops and Offices Act required half day closing for all shops except fruit shops, fish shops, tearooms, cafes and railway book stalls. Hours were limited from 8.00 a.m. to 6.00 p.m. four days a week, extended to 8.00 p.m. on one day with another half day.

In 1936 the 44 hour week became regulation. Although for several years the half day was Wednesday, and Saturday was a full trading day.

In 1945 the 5-day, 40-hour working week was introduced and Saturday trading in New Zealand disappeared for 35 years. However in 1955 an 'approved goods list' was created which stipulated goods that could be sold at any time.

The Shop Trading Hours Act 1977 came into force establishing a three member Shop Trading Hours Commission; one magistrate, one union member and one employers member. The act also made provision for a small number of 'special goods' to be sold on Saturdays.

The last major change to the Shop Trading Hours Act was written in 1980. This amendment provided for the restoration of Saturday Trading with trading hours from 7.00 a.m. to 9.00 p.m. daily, except Sundays and public holidays.

The Shop Trading Hours commission was reduced to one member. A 'fast-track' exemption procedure was introduced where dairy/mixed business could apply for exemption from the Acts Trading Hours.

Present Situation

There is still no Sunday trading and no 24-hour trading in New Zealand. However, for Queenstown retailers the Shop Trading Hours Commission has granted a 24 hour per day trading exemption. This exemption is to be reviewed in July 1986. In other parts of the country various traders have been given shop trading hours exemptions.

(Source: Department of Labour, pers com.)

Impact on Tourism

Although the present legislation governing Shop Trading Hours in New Zealand is more liberal than it was ten years ago, our regulations are still very restrictive compared to those in other countries. While it is not possible in this study to quantify the 'cost' of having restricted trading hours in New Zealand and have some dollar cost to the tourism industry included in our study, we must not assume that the regulations have no impact at all on the industry. The Tourist and Publicity Department is currently preparing a paper on this issue for the Minister of Tourism. Until that paper is completed and presented they are not prepared to state their views on the issue of Shop Trading Hours in New Zealand.

2. Gambling Regulations

Gaming and Lotteries Act 1979

In recent years there has been speculation about when and if the government would legalise gambling in New Zealand and allow the country's first legal casino to be opened. No government has made any attempt to revoke the Gaming and Lotteries Act 1977. That Act specifically prohibits the games of chance for commercial gain and prohibits gaming machines. However the Minister of Internal Affairs may grant licenses to conduct games of chance to societies provided that the object of the society is to raise money and that no money shall be paid to or received by any person for conducting the games of chance.

Future prospects for a casino in New Zealand do not look very encouraging. What effect the operation of a gambling casino outside New Zealand's twelve mile territorial limit will have on the attitude of our legislators is difficult to say. The Tourist and Publicity departments view on the issue of legalising a casino in New Zealand is that a casino would not attract visitors to New Zealand in its own right. It would "merely add another facility people could enjoy during their stay in New Zealand."

3. Liquor Licencing

The liquor industry in New Zealand is one of the most regulated and controlled aspects of the economy. All forms of licence, with the exception of wine distributors licence, are restricted by the Sale of Liquor Act 1962. These licences determine what may be sold, and when and to whom liquor can be sold.

In some areas distribution is controlled by large companies. This acts as a major obstacle to new entrants and has led to a reduction in competition.

The effect of a highly regulated and controlled liquor industry in New Zealand is:

- a) the unavailability of liquor on certain days and outside stipulated trading hours
- b) the fact that alcohol can only be purchased from licenced outlets, who are also specialist liquor outlets - i.e. alcohol cannot be purchased at a supermarket as in other countries.

- c) the variation in price that exists throughout the country due to the distribution chain dominance and restrictions in availability of licences.

While the effect of these regulations is more severe on New Zealand residents, there is no doubt that the international visitor to New Zealand is also affected. There is presently a working party considering submissions on liquor licencing in New Zealand. The Tourist and Publicity Department would like to see the laws simplified, the number of types of licences reduced and controls on opening hours limited to a minimum and maximum number of hours per week. They would also like to see the link between food and alcohol licences more closely aligned making it easier for restaurants to obtain and/or lose liquor licences.

Again to quantify these effects is rather difficult, but when discussing assistance to the tourism industry it is important that barriers such as these are at least identified.

4. Taxis

The Transport Amendment Act of 1983 removed many of the restrictions which affected land transport. Entrants into the licensed transport sector are no longer, from June 1, 1984, required to prove a demand exists for their service, but only that the service will be provided in a safe and reliable manner. This does not apply to the taxicab industry which remained virtually untouched, but "it is intended that a review of the taxi industry be carried out to determine if the current licensing system in force for it remains appropriate" (Ministry of Transport, undated).

Restrictions are placed on the number of taxicabs in New Zealand, and new entrants must purchase a permit on the open market from an existing operator. Prices vary by region, but \$24,000 per vehicle is estimated by the Ministry of Transport (MOT) as being a national average of the market value of these quotas. Applying this to the 2,500 taxicabs in New Zealand gives a total market value of approximately 60 million dollars. Two problems exist in estimating cost excesses to the tourist industry, the discount rate to use and the tourist share of total business.

Given the uncertainty associated with the review of the industry, it would seem appropriate to use a high discount rate. Accordingly, 33.3% has been chosen. This reduces rents to some \$20m annually. An estimate of 10% of taxicab business as being tourist related was obtained from the largest Christchurch operator. This is reinforced by an estimate obtained of 7% of total taxi calls in Christchurch being airport visits, admittedly an arbitrary measurement. Thus, the cost excess for 1986/87 is estimated at \$2m.

Problems exist in extrapolating what is essentially a marginal analysis over an entire industry. Should the industry deregulate, more information would be needed on the industries' cost curves before definitive statements can be made as to the degree of cost excess. Two million dollars for 1986/87 will be used as the best estimate, and a Transport Industry deflation used to back-date this estimate.

5. International Airline Landing Rights

Background

The issue of International Airline Landing Rights is a complicated and much debated one. Basically international civil aviation has been highly regulated with regulations covering not only safety but price, capacity and nature and types of service. New Zealand has historically had a highly regulated international aviation environment.

A 1975 review of Civil Aviation in New Zealand stated that Air New Zealand's principal objective was the development of a pattern of regional and long haul services within the Pacific Basin designed to promote foreign travel to New Zealand and to carry New Zealanders overseas. Air New Zealand was to also have other roles as a flag carrier, a promoter of our tourist attractions and as a major earner of foreign exchange.

Scheduled air services to and from New Zealand operate according to bilateral agreements, as do most international air services. In the past the decision whether or not to enter into such agreements has been made by the government in consultation with Air New Zealand, and approval will be given to those seeking licences for services where it is thought that those services will advance New Zealand's policy goals.

It is also believed that New Zealand should continue to have a state owned international airline because of its foreign exchange earning capacities and its role as an import substitution industry. New Zealand with its own airline can influence the type, cost and frequency of air services including domestic links and routes. Having our own international airline gives us more flexibility when negotiating bilateral agreements, and because the airline is a 'flag carrier' it has a means of promoting New Zealand overseas. Despite the impressive list of benefits we gain from having an international airline of our own, international civil aviation is highly regulated, especially in terms of entry barriers, and in the area of controls on existing operators. Thus the consumers i.e. exporters, importers, tourists, face high charges and restricted services.

An example of the assistance given to international airlines can be seen from the recent purchase by United Airlines of Pan America's Pacific operations. It has been estimated that of the US\$750m paid to Pan Am, US\$350m was for the licences (i.e. landing rights) to the routes. On this basis, given United's cost structures, airfares are approximately 10% above competitive rates (Treasury Departmental Paper - Review of External Civil Aviation Policy). In a free market environment the value of licences would be zero.

The Impact on Tourism in New Zealand

The two most important effects of a highly regulated restricted air services market are the above competitive level air fares and the restricted services supplied (Findlay, 1985, Findlay and Forsyth, 1985).

Because of New Zealand's isolation both have a major impact on the tourism industry in this country. International air fares priced above competitive levels act as a tax on the international tourist industry and will along with frequency of service restrictions, restrict the numbers of tourists travelling to New Zealand.

The estimated increase in airfares due to market imperfections of 10% allows some quantification of the protection afforded Air New Zealand to be calculated.

In 1982 Air New Zealand earned \$491,337,000 from passenger fares. Of this 70% (\$343,936,000) is revenue from international services and of this \$343,936,000 earned from international services only 40% is revenue related to flights into New Zealand - \$137,574,000. If, as it has been estimated, assistance amounts to 10% of airfares then Air New Zealand was being assisted by approximately \$13.8m in 1982. Similar calculations give figures of \$15.9m for 1983, \$18.6m for 1984 and \$23.7m for 1985.

As Air New Zealand is only one of 12 international airlines flying into New Zealand, the actual level of assistance afforded to international airlines is much higher than the above figures would suggest.

On the trans-Tasman route Air New Zealand has 40 % of the capacity available, on the long haul Pacific routes 55% and on the Orient routes 50 %.

This gives Air New Zealand an overall seat capacity of about 40 % of total capacity allowable into New Zealand.

The figures presented above can be recalculated to give a better estimate of the total assistance afforded to international airlines and a better estimate of the implicit tax the New Zealand tourist industry faces as a result. The revised figures are:

for 1982 \$13.8 m	
-----	= \$34.50 m
0.4	
1983 \$15.9 m	
-----	= \$39.75 m
0.4	
1984 \$18.6 m	
-----	= \$46.50 m
0.4	
1985 \$23.7 m	
-----	= \$59.25 m
0.4	

The actual cost to the tourist industry may in fact be higher than the figure stated above depending upon the price elasticity of international airfares. If the price elasticity of airfares is high, then the cost of protection of Air New Zealand to the tourism industry may be significantly larger than estimated above. High price elasticity means that a reduction in price of airfares would lead to a significant increase in demand for international air travel.

However, McDermott and Jackson show an airfare elasticity of less than one, in absolute terms, for international arrivals in New Zealand. They consider this is contrary to economic expectation, but consistent with studies from other countries. A 10% decrease in fares would increase visitors from between 1.35 % from the United States to 9.5% from Japan.

These same airfare regulations apply to New Zealanders travelling overseas. To the extent that a domestic holiday is a substitute for these people, the high airfares are a subsidy to the tourist industry. Thus the figures presented above should be offset by a subsidy to domestic tourism. Additionally, these estimates take no account of cost inefficiencies which may exist within Air New Zealand or the non-availability of so-called "no frills" air fares. Also, no equity considerations about the distribution of the rents have been considered. Some 40 % accrues to New Zealanders as owners of Air New Zealand while the rest accrues to owners of other Airlines.

Summary

Of the five specified areas where regulations affect the tourism industry, the most controversial is the issue of international airline landing rights.

That does not by any means imply that the others are insignificant regarding their affect on the tourism industry or indeed the public of New Zealand in general.

While the impact of liquor regulations, shop trading hours and gambling has not been quantified here, a study of the tourism industry in New Zealand cannot ignore their impact. Indeed quantification of the impact of each on the tourism industry is a major undertaking and an area where further research could be directed.

Likewise the protection figures calculated for the international airlines are only estimates, probably understated, but they give some indication of what market imperfections are costing the tourist industry in New Zealand.

Other subsidies are provided to the Tourist Industry in the form of taxation incentives, export market and performance grants and regional development incentives. Also, taxation in the form of cost excesses on inputs needs to be considered before rates of assistance can be quantified. These will be addressed in later research, and the present paper must be regarded as a preliminary exploration of subsidies and the "cost" of legislation.

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Efficiency and Equity in Agricultural Research

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SUMMARY

This paper reports on a study of the returns to investment in agricultural research in New Zealand from 1926-27 to 1983-84. A model relating productivity to lagged expenditures on research and extension is estimated. The internal rate of return to agricultural research is estimated to be around 30 percent. The paper presents some simulations of the effect of changes in the level of research funding and concludes with a brief discussion of the equity issue.

Key Words: Agricultural Research, Productivity, Returns to Research and Development, Funding.

INTRODUCTION

There are two central issues in the funding of agricultural research: efficiency and equity. In the last three decades both these areas have become major topics on the research agenda of the agricultural economics profession.

Starting with the initial estimates of the value of inputs saved as a measure of the returns to enhanced productivity (Schultz, 1953) there have been a stream of studies measuring the returns to research (see Ruttan, 1982) in both domestic and international settings. (Evenson et al., 1979, Schuh and Tollini, 1979, Scobie, 1979) The equity issue has been increasingly addressed (Scobie, 1976; Binswanger and Ryan, 1977; Scobie and Posada, 1978; Edwards et al., 1982; Alston and Scobie, 1983) in both developed and developing countries. What is perhaps surprising is that there has only been one attempt to our knowledge, to examine the return to investment in research in New Zealand (Dick et al., 1967) and that was based on some unpublished estimates by Philpott. Similarly, the extent of the debate on funding of agricultural research would appear to be limited to Blyth and Beck (1983), Bushnell (1983) and Scobie (1984). It is our belief that an important area of economic research has been neglected.

This paper is an initial attempt to fill that void. It

presents estimates of the rate of return to investment in agricultural research in New Zealand based on a simple econometric model of investment in new knowledge. It is to be followed by a monograph which will provide the full details of the data and methods (Scobie and Eveleens, 1986).

THE MODEL

The contribution of research is viewed as arising from the increments to the stock of knowledge generated by investment in research. This capital theoretic view of the contribution of research is outlined below.

Following Evenson (1984) and Norton and Scobie (1980) we postulate that the process of generation of knowledge is an economic activity carried out by a series of interlinked, specialised agencies. The industrial sector involves different stages of production; some firms produce coal which is used by others to produce steel, which in turn is sold to appliance manufacturers. In an analagous manner there are agencies which undertake pre-technology research (eg plant genetics) using as inputs the knowledge generated by the pure sciences (eg biochemistry). The output of the pre-technology stage is then used for the development of technology (plant breeding) which is in turn screened and adapted for final use (new seeds).

The pre-technology stage can be depicted as

$$KP_t = KP_{t-1} (1 - dP) + IP_t \quad (1)$$

$$IP_t = IP (RP(L) ; KP_{t-1}) \quad (2)$$

where the existing stock of pre-technology knowledge (KP_t) is given by the sum on the depreciated stock (depreciated at rate dP) plus the increment to knowledge (IP_t) generated by a production function whose arguments are the lagged values of research (L is the lag operator) conditioned by the existing stock of knowledge (KP_{t-1}).

In the next stage the stock of knowledge pertaining to technology is given in like manner by

$$KT_t = KT_{t-1} (1 - dT) + IT_t \quad (3)$$

$$IT_t = IT [RT(L) ; KT_{t-1}, KPU_{t-1}] \quad (4)$$

$$KPU_t = aP [RT(L)] * KPU_{t-1} \quad (5)$$

where the increment to knowledge now depends on the

arguments of lagged research expenditures and the function is conditioned by both the existing stock of relevant technological knowledge and the proportion of the stock of pre-technology knowledge which is actually utilised. The utilisation rate (aP) is itself a function of the lagged research expenditures.

Finally we have the production of the product itself (Q_t) which will depend on the level of inputs (X_t), exogenous factors (Z_t) and the level of knowledge actually utilised.

This utilisation rate will depend on the ability to acquire and process information about new technology (Schultz, 1975). Factors such as the level of human capital (H) and extension services (E) will alter the relative price of acquiring and using new technology.

$$Q_t = Q (X_t, Z_t, KTU_t) \quad (6)$$

$$KTU_t = aT * KT_{t-1} \quad (7)$$

$$aT = aT (H, E, \dots) \quad (8)$$

Clearly, the system of equations (1) to (8) involves variables which are not observable, although proxies have been used in some studies (see Evenson, 1977) for the stocks of knowledge (KP and KT). However by repeated substitution it is possible to specify current output as a function of the flows of research expenditures which generate the stocks of knowledge.

$$Q_t = Q (X_t, Z_t, RP(L), RT(L), H, E, \dots) \quad (9)$$

This model is then redefined in terms of productivity (P):

$$P_t = (Q_t / X_t) = P (Z_t, R(L), H, E) \quad (10)$$

THE ESTIMATION

Equation (10) describes a relationship between agricultural productivity and its determinants and is in effect the reduced form of the structure sketched in equations (1) to (8).

In order to calculate the returns to investment in research it is necessary to specify equation (10) in a form which can be estimated statistically (Lu et al., 1979). High multicollinearity arises when applying this model to time series data and it did not prove

possible to estimate the separate effects of R(L), H, and E. For this reason these three variables were combined in a variable defined as REH, and the estimating model written as

$$\ln P_t = c + w \ln W_t + i I_t + B_i (REH)_{t-i} + E_t \quad (11)$$

to be estimated subject to the restrictions that:

$$B_i = r_0 + r_1 i + r_2 i^2$$

$$B_{-1} = 0$$

$$B_{K+1} = 0$$

where

P_t = an index of agricultural productivity
(1949-50 = 100)

c = constant term

W_t = the number of soil moisture deficit days weighted by major agricultural areas

I_t = deviation of real net farm income from a linear trend

REH_t = real expenditures on agricultural research (public and private) plus public expenditures on extension augmented by an index of human capital defined as the cumulative sum of enrollments in agricultural education in the previous fifteen years.

E_t = random error term

The restrictions on the B_i follow from the concept that research contributions increase slowly (due to research and adoption lags) and after reaching a peak decline due to the depreciation of the stock of capital (represented by the knowledge) generated by research. It is assumed that knowledge has a finite useful life.

In addition to the marginal productivities of research (B_i) the total length of the lag (K) is a crucial parameter to be estimated. This was done by searching over lags of $K = 1$ to 30. The final choice was made on a basis of the mean squared error, R-squared, and the significance levels of the estimated coefficients. The equations were estimated with a correction for

auto-correlation.

The deviations from trend in real net farm income are include to allow for the intertemporal switching in the purchases of inputs, a phenomenon in part reflecting the taxation laws. In years of say unexpectedly high farm incomes, observed levels of purchased inputs are abnormally high. This results in sudden drops in measured productivity as there is no commensurate rise in output in those years. Likewise when input purchases are deferred due to unexpected drops in net income productivity rises.

THE RESULTS

The focus of this study is the changes in agricultural productivity in past years back as far as the 1920s. Increasing productivity in any economy is an important source of economic growth. In New Zealand, where agriculture has traditionally represented such a large part of the economy, agricultural productivity growth is a vital factor. Figure 1 shows the trend in New Zealand agricultural productivity since the 1920s.

In the 1920s agricultural productivity was approximately 1, which implies, by definition (of productivity), that agricultural outputs and inputs were about the same. By the 1980s productivity had increased to approximately 1.7 which suggests that outputs were 70 percent higher than the corresponding inputs. Improved productivity results in a saving of inputs to produce the same level of output; or alternatively, an increase in output holding the level of inputs constant.

Underlying this productivity model is an Almon lag structure which has been imposed on the REH variable (equation (11)) causing marginal returns to increase up to a peak and then decline symmetrically. After searching over all lags from 1 to 30, a 23 year lag length was chosen on the basis of the criteria mentioned above. The peak marginal return occurs after 11 years. Four of the thirty year lag structures which were estimated, are presented in Table 1. For each of the lags the marginal return to productivity is broken down to show the distribution of the annual increases (that is, the Almon lag structure). The table also shows the coefficients and t-statistics of the other variables in the model, together with some statistics upon which the choice of the "best" lag length was based.

Table 1 Estimates of Distributed Lag Equation for New Zealand Agriculture.

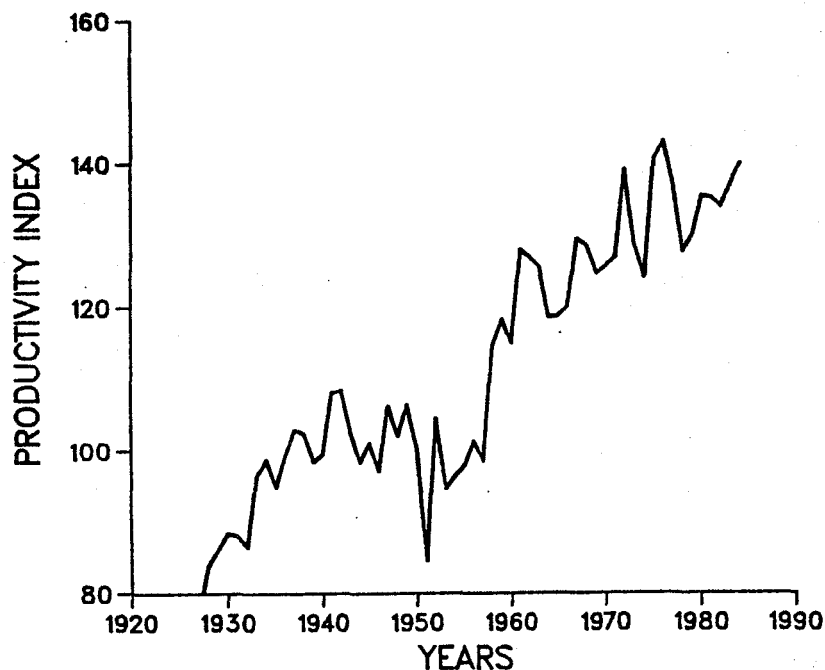
Variables	K: lag length (years)			
	8	16	23	29
Constant	3.5098 (12.93)	3.1723 (12.50)	3.0732 (9.95)	3.5208 (9.98)
Weather	-0.1372 (-0.89)	-0.0119 (-0.70)	-0.2714 (-1.29)	-0.0152 (-0.70)
Deviation from Income	-0.97E-06 (-4.46)	-0.10E-05 (-4.72)	-0.83E-06 (-3.20)	-0.47E-06 (-1.67)
Distributed lag weights (in years)				
0	0.0060	0.0022	0.0013	0.0006
1	0.0106	0.0042	0.0025	0.0012
2	0.0136	0.0059	0.0035	0.0017
3	0.0151	0.0073	0.0045	0.0022
4	0.0151	0.0084	0.0053	0.0027
5	0.0136	0.0093	0.0060	0.0031
6	0.0106	0.0098	0.0068	0.0034
7	0.0060	0.0101	0.0072	0.0038
8		0.0101	0.0076	0.0040
9		0.0098	0.0078	0.0043
10		0.0093	0.0080	0.0045
11		0.0084	0.0081	0.0046
12		0.0073	0.0080	0.0047
13		0.0059	0.0078	0.0048
14		0.0042	0.0076	0.0048
15		0.0022	0.0072	0.0048
16			0.0067	0.0047
17			0.0060	0.0056
18			0.0053	0.0045
19			0.0045	0.0043
20			0.0000	0.0040
21			0.0025	0.0038
22			0.0013	0.0034
23				0.0031
24				0.0027
25				0.0022
26				0.0017
27				0.0012
28				0.0006
29				
30				
Sum of Weights	0.0153 (5.19)	0.0101 (7.22)	0.0081 (5.13)	0.0048 (4.04)
Adjusted R-squared	53.66	71.90	74.3400	47.68

Standard Error of Estimate	0.0515	0.0481	0.0482	0.0441
Durbin-Watson Statistic (after adjustment)	2.03	2.01	2.0500	2.03
Autocorrelation coefficient	0.6271	0.4374	0.3800	0.3900

Numbers in parentheses are t-statistics

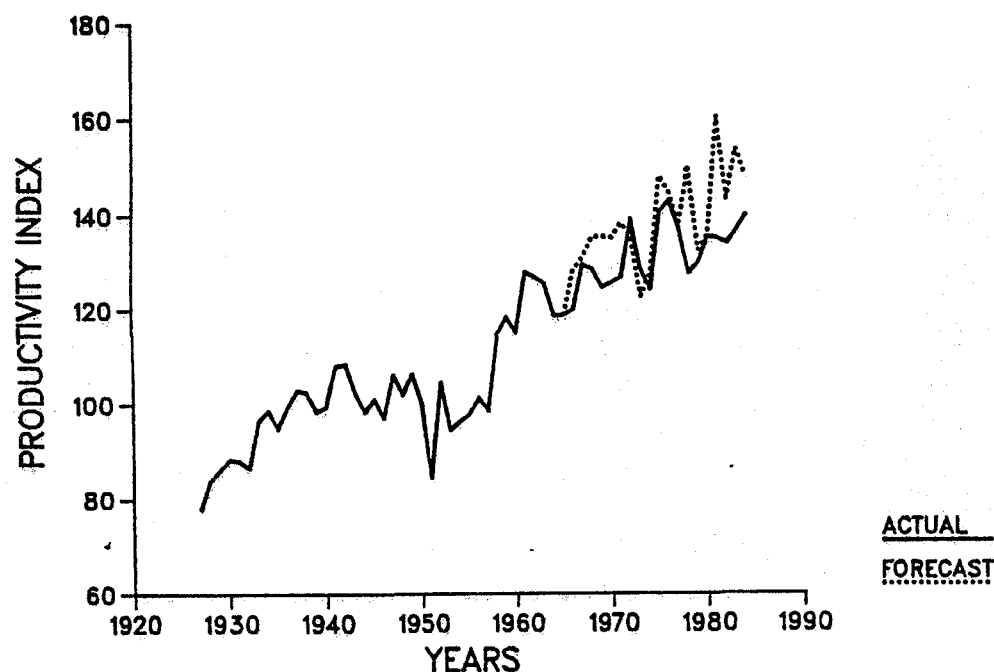
The predicted values of productivity from equation (11) are shown together with the actual values in Figure 1. A much more rigorous test of any econometric model is its forecasting ability outside the data period used for estimation. The model was estimated using data up until 1964-65; forecasts for the following 20 years were then

Figure 1: Agricultural Productivity Index
(1949/50=100).



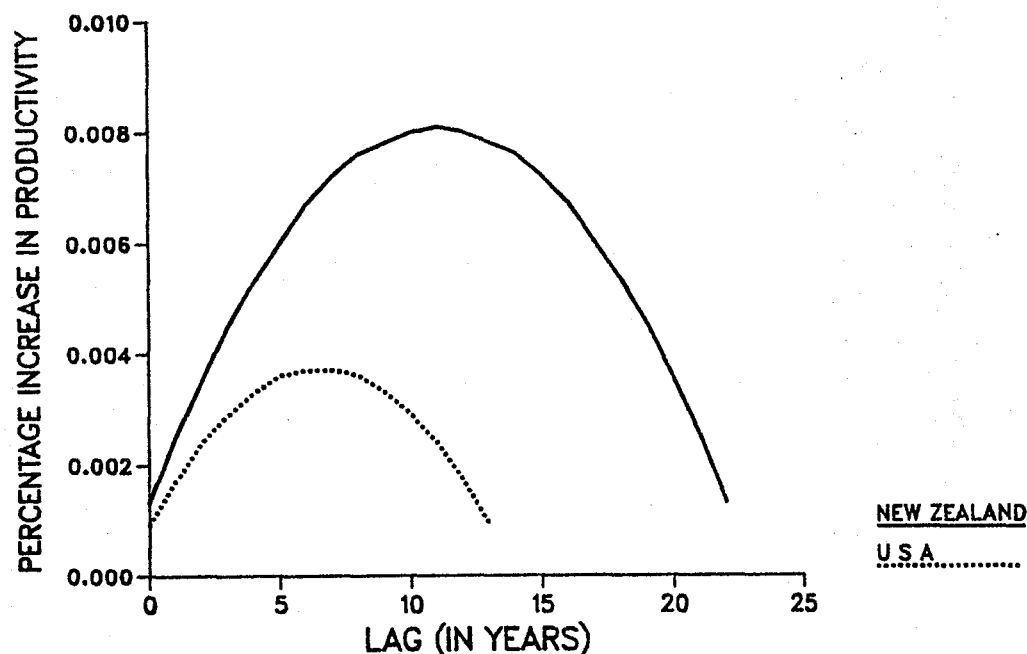
used and are compared to the actual values of productivity in Figure 2. The forecasting ability in the 1980's where the errors are greatest, was not improved by lengthening the data period (and hence shortening the forecast period). Other forces not included in the model were clearly operating during these years.

Figure 2: Agricultural Productivity Index:
Actual and Forecast (1949/50=100).



A similar study of agricultural productivity for the USA (Lu et al, 1979) found that the lag length applicable to the American farming system was 13 years with a peak after 7 years. A comparison of these two differing lag structures is shown in Figure 3. The shorter lag for the U S is consistent with the dominance of cropping in that country for which the research and extension lags are predictably shorter than in New Zealand's pastoral agriculture.

Figure 3: The Lagged Contribution of Research to Productivity.



Once the lag has been chosen we can turn our attention to the returns to the investment in research. In order to calculate an internal rate of return, two different research strategies were investigated. One involves holding research expenditure constant at the 1984 level, and the other follows the same pattern with the one exception that in the first year (1985) research expenditure was incremented by one percent. Both these strategies were used to predict the changes in productivity and output.

To calculate an internal rate of return, it is necessary to have a cost in period t (1985) and a stream of benefits in years following this cost. The cost in this case represents the increase in research expenditure; that is, the one per cent difference between the two strategies outlined above. In a similar manner the benefits represent the difference between the output of the two strategies. The output was calculated using the predicted productivity levels and a constant (1984) level of inputs.

Using this method, we may now look at the effect of say a one dollar investment on the productivity over the next 23 years. In doing this, the variables other than

research expenditures are held constant at their long run average levels. The model predicts that a one dollar investment results in total benefits to the value of \$8.55; however discounting these at a rate of 10 per cent, means they are worth \$2.81 in present value terms. These results provide the basis for the internal rate of return calculations. By employing our best estimate of the lag length, 23 years, the internal rate of return is calculated at 29.74 percent. By comparison the results of the U S study showed an internal rate of return of 26.5 percent from total undiscounted benefits of \$4.30 over 13 years.

The internal rate of return was calculated for several different lags; the results are set out in Table 2. It can be seen that lengthening the lag causes a reduction in the internal rate of return. This is of course what one would expect as a longer lag length requires one to wait longer for the benefits and this waiting period has a cost.

Table 2: The Rate of Return to Research

Number of years over which research benefits accrue	Annual Real Rate of return to research
	Percent
8	66
16	39
23	30
29	15

It is sometimes argued that the number of major breakthroughs emanating from research have become less frequent. This leads to the hypothesis that the marginal productivity of the dollars spent on research may have fallen. To test this hypothesis, a Chow Test was employed.

The data set was divided into two periods: the first from 1950-1965 (I) and the other 1965-1984 (II). The null and alternate hypothesis were set up as:

$$H_0: (B_{t-i})I = (B_{t-i})II \quad \text{for } i = 0, \dots, k$$

$$H_a: (B_{t-i})I < (B_{t-i})II \quad \text{for } i = 0, \dots, k$$

As our main emphasis is on testing for the effect of

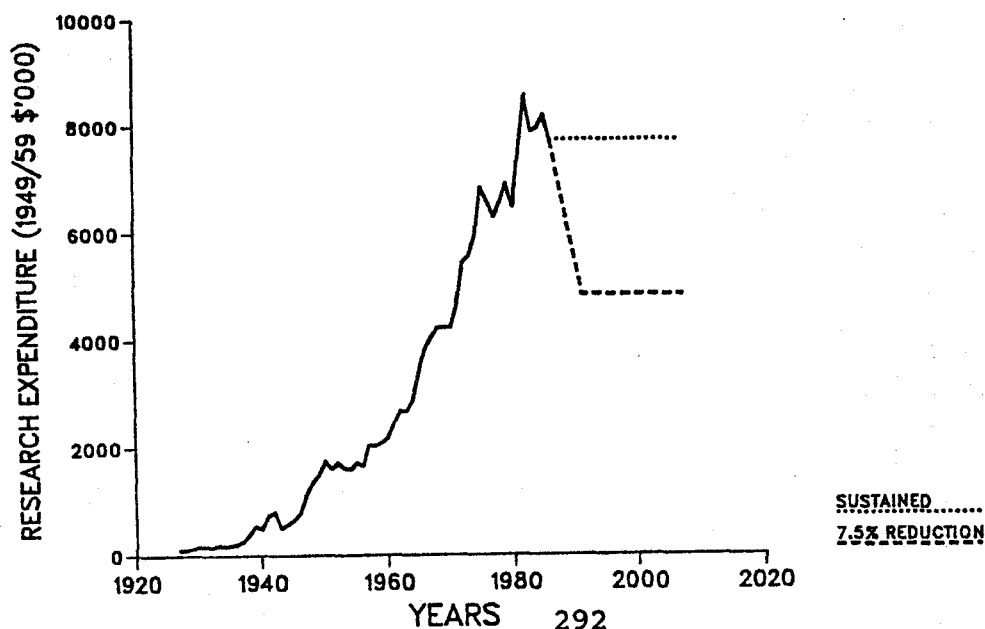
different data sets on the coefficients of the research variable, the coefficients of the other variables (namely weather and income deviations) were constrained to be equal in both periods. At the 0.05 significance level the null hypothesis was accepted; there is no evidence that the marginal productivity of research has declined over time.

POLICY SIMULATIONS

In this section the model is used to perform policy simulations, to provide an indication of the effect changes in research spending on future productivity and output.

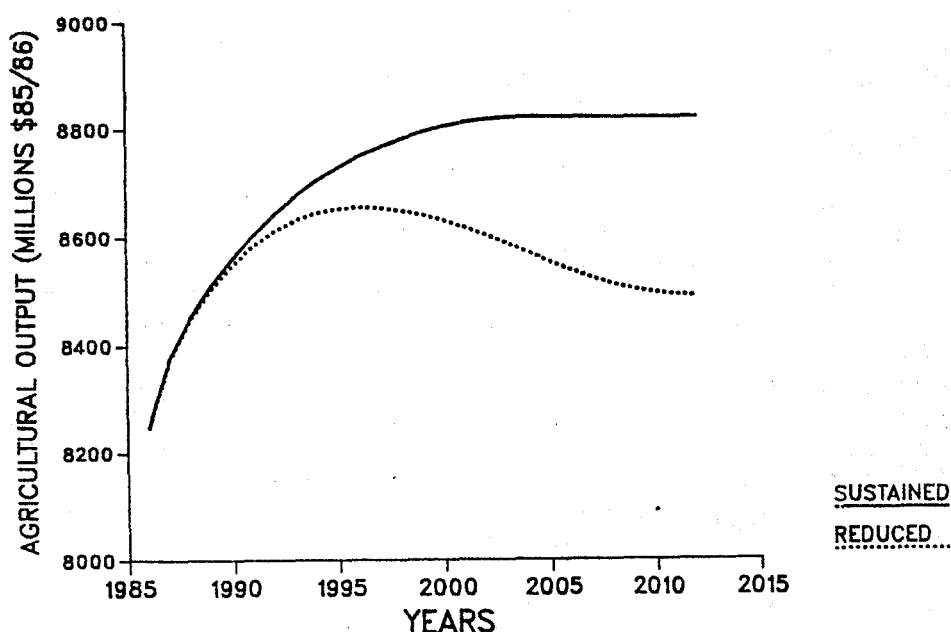
Significant cuts in the public funding of agricultural research are currently being implemented. As there is a substantial lag between the expenditure on research and the benefits generated, research is particularly vulnerable to "budget balancing" policies. For this reason, we believe it is important to examine the effect of reduced research expenditure on future productivity. Two future strategies have been examined. The first sustains the investment in research at its 1985-86 level (in real terms); the second involves a reduction in research expenditures at a rate of 7.5 percent per year for the next five years, after which it is assumed to be sustained at that reduced level. These two strategies are shown diagrammatically in Figure 4.

Figure 4: The Effect of Cutting Research by 7.5 Percent Per Annum.



The impact of these strategies in terms of future productivity growth was estimated. The predicted productivity estimates were converted to real output by using constant (1985-86) levels of inputs. Figure 5 shows how the two different paths of output corresponding to the two research strategies.

Figure 5. The Value of Output Foregone.



As mentioned above, initially there is very little change in productivity as a consequence of the reduction in research funding. The situation alters as we move further into the future. Beyond approximately 10 years significant reductions in productivity growth (and hence the value of output) begin to arise as a result of cuts in research expenditures 10 to 20 years earlier. If we turn the question around and look at the effect of sustaining research expenditure at the 1985 real level, we can calculate the additional funding that would be required to sustain this level as opposed to the reduced level. The payoff to this strategy would be the difference between the two output paths shown in Fig. 5. The net present value of the funding in 1985 dollars (discounted at a rate of ten percent) would cost \$255 million. However the extra benefits would be of the

order of \$738 million in 1985 dollars, which implies a benefit cost : ratio of 2.9 : 1 or alternatively an internal rate of return to the marginal investment of 34%.

EQUITY ISSUES

There would seem to be only two justifications for significant reductions in the level of public funding for agricultural research. In limiting the discussion to two reasons, we are rejecting cuts in research investment as a fiscal policy tool simply to help balance the budget. The first would be on efficiency grounds. If it were to be established that New Zealand had been overinvesting in research, and as a consequence had driven the rate of return to the investment below the social opportunity cost of the resources, then there would be a prima facie case for reducing the level of funding. We would argue that despite the limitations inherent in our attempt to measure the return to research the evidence is sufficiently strong to reject the hypothesis that there has been significant overinvestment. At present we spend about one percent of the value of agricultural output on research, a figure surpassed by many middle income developing countries, and well below the average level of the industrialised countries. But such comparisons are no more than indicative; the substantive evidence comes from the significant relationship between lagged research investment and productivity growth established by the present results.

If there are no apparent grounds based on efficiency, then the proposed reductions in public investment must rest on equity grounds. In a small open economy, the economic surplus generated by technologically induced shifts in product supply functions will accrue in large part to producers and processors (and foreign consumers), in contrast to domestic consumers, who face prices set in world markets. More explicitly the rents will accrue to the owners of factors with the most relatively inelastic supplies.

In view of this incidence of benefits, it would not seem inconsistent with a "user pay" approach to research funding, to expect a greater contribution from industry sources. It may well be that the high proportion of public support has displaced some potential private and industry funding of research in the past, though testing this hypothesis is a challenge we are yet to face. We can identify three groups of beneficiaries of research: private agents (individuals, firms,

syndicates); industry groups; and society at large. Where the benefits can be appropriated by private agents or internalised by industry groups we would expect them to invest in research and development, using the same principles of investment analysis that they would apply to any other form of investment. Whether the transaction costs of forming the relevant groupings might be lowered through the introduction of statutory powers (e.g. by the imposition of rural research levies) is an issue requiring further attention.

Where the benefits of research have spillovers to the wider community (e.g. through improvement of environmental quality) then the transaction costs of funding research may well be minimised by using tax revenues. Clearly, there is much to be resolved about the appropriate mechanisms for the conduct and funding of research and development, to ensure the incidence of costs more closely mirrors the incidence of the benefits. But on equity grounds it would seem difficult to justify the current levels of contribution by non-rural taxpayers, who fund over 80 percent of domestic research and development in agriculture.

CONCLUDING COMMENTS

This study constitutes an initial step to quantify the payoff to research investment in the agricultural sector. We are acutely aware of its limitations and we highlight some of these in this final section.

Perhaps the most serious are those inherent in any study based on time series data. We have been unable to isolate the separate effect of research investment, extension efforts and the contribution of human capital. We would expect that very different lag structures apply to research and extension, but the data do not provide us with the variation needed to separately estimate the parameters of such structures.

It is argued that the gains from research are lower today as the research lag has increased, presumably due to diminishing marginal returns to research. Potentially one could test this hypothesis by comparing the coefficients of the lag structure for two different periods. But this involves an explosion in the number of parameters to be estimated in contrast to the parsimony we achieved through the imposition of the Almon lag structure.

In explaining agricultural productivity growth we have made no explicit allowance for the impact of general productivity in the economy on the agricultural sector.

At best we have to argue that improvements in such areas as transport and communications have been captured in the real prices of these inputs and are hence included. The same applies for technological improvements embodied in purchased inputs. Is it sufficient to argue that measured farm inputs fully capture the "quality" effect? If not, and if such shifts are correlated with total research expenditures, then the parameter estimates will be biased.

Our ability to explain productivity growth in the 1980's is significantly inferior to that of earlier years. What additional features are needed to account for this? Would an index of diversification reflecting changes in the output mix be appropriate? And is there a significant learning-by-doing effect so that productivity growth is in part a function of the growing size of an industry over time?

Finally we conclude this list of residual ambiguities by raising the matter of the costs of public finance for research. We have assumed that the dead weight loss per dollar of tax collected for and applied to research funding has been zero. Evidence for the U.S.A suggests this loss could be as large as 50 cents per dollar collected (Ballard et al., 1985). These losses would need to be charged against public expenditures to reflect the true opportunity costs of research funding by the public sector. This has been shown to reduce the estimates of the rate of return to U S agricultural research by as much as 30 percent (Fox, 1985).

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THE AGRICULTURAL SECTOR AND THE FREE MARKET

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LINCOLN COLLEGE
CANTERBURY

From the early recorded minutes of the New Zealand Farmers Union it is evident that the farm sector sought freedom to operate to best advantage. It adopted a virtual doctrinaire stance against any form of tariffs on imported inputs - a position that was carried to an absurd degree at times. At least, however, they could be said to have been reasonably consistent; as I have noted that in their 1904 Conference they were advocating that 'Government agree to the importation of 'healthy women of good character for domestic duties in rural areas'!

As today, they looked to Government to resolve most of their problems and provide the network of services necessary for a fast developing industry. The provision of access, communications, law and order, a land registration system, technical and scientific advice, research, education, transport, land settlement, finance, climatic disaster relief, and trade access for their products. These were just some of the sectors in which the farm industry looked to Government for assistance.

In a young country where foreign exchange was the main determinant of living standards, farming occupied the centre stage as the industry that 'brought home the rent'. It is little wonder that farmers, although they professed strenuous independence, were often labelled 'Socialists in riding breeches.'

The author recalls pleas made in the early 1960's for Government to deal with the threat to the industry of opossums. The conference resolved that 'as Government was responsible for the introduction of opossums to New Zealand it must be financially liable for their destruction!' The resolution was carried unanimously and it was demanded that it be conveyed to Government forthwith! Meanwhile, some research into the topic had shown clearly that an earlier Government had agreed to the introduction of opossums only after the Farmers Union, around 1919, had pleaded with it to do so to help farmers offset the falls in income from traditional products. The resolution was discreetly buried.

Government intervention in the New Zealand farm sector has always been considerable - regardless of the Political Party in power. It is true that between the main farm industries there have been important differences. For example the decisions taken in 1936 set the dairy industry on a path much closer to Government than, say, the sheep-beef producers. But although there were initially some wide gaps between these two industries they narrowed during World War 11 and in the Post-War era/ The main differences all along were, of course, in the organisation of the processing of the products of the industries and in the marketing of the processed products. Nevertheless Government remained very involved in both industries and if an analysis were carried out of resolutions adopted by the farmers' pressure group organisations, around 80 per cent of the resolutions were destined to end up on the desk of a Cabinet Minister or the Permanent Head of a Government Department. The cries of 'Less Government in business' were hardly applicable to farming as a business. The participants in agriculture wanted to be able to hold the hand of Government in a

multitude of ways. They believed (and were often reminded by politicians) that what was good for agriculture was good for New Zealand. Even the most extreme 'free enterpriser' had little hesitation in approaching Governments for a solution to their problems.

But closeness of farming and Government on most matters did not however prevent farmers from disagreeing, at times strongly, with policies adopted by Government. For instance following the imposition, across the board, of import controls in 1938 the farm sector expressed its fears on the impact on costs of its inputs. But the onset of World War 11 and the prosperity enjoyed by the farm sector in the period of almost 20 years following the war obscured the real effects. It was not until the latter half of the 1960's that the farm sector really became alarmed at the impact on their costs of the autarchic policies being pursued by both political parties.

By the early 1970's internal inflation reached double-digit levels, sheep farm incomes were reducing significantly in real terms, while levels of farm investment were not recovering sufficiently despite a mass of Government incentives introduced after the Agricultural Development planning exercise.

The farm lobby made a valiant attack on industrial protection and indications were that at long last a worthwhile break-through would be made. The then Government - which had a large number of farmer cabinet ministers out of all proportion to their numbers in the community, stated in its 1971 Budget that 'It is the Government's policy to replace import licencing by tariffs as the main measure of protection. The Government has now decided to institute a major review designed to accomplish this objective within 5 years.....'

- But the manufacturing lobby once again showed they could outwit and out-manoeuvre the farmers. In a brilliant exercise they won easily - some farm leaders were even returning to their organisation pleading for greater sympathy for the cause of the protected industries! One leader actually said, in an emotional statement at one forum,....' and what's more they (the manufacturers) have promised to support us if we want more subsidies from Government!' History will show that in the early seventies the farm sector came very close to achieving a break-through in its campaign to liberalise New Zealand's industrial protectionist policies. But confronted by a sophisticated campaign on the part of shrewd and determined industrialists their efforts withered. The forces of flattery, free lunches and other most generous hospitality proved irresistible to enough rural leaders.

Not surprisingly the Government's resolution to replace import licencing by tariffs was again laid aside and the agricultural sector continued to endure the consequences of industrial protectionism. A message was clearly but obliquely conveyed to the general-purpose farm organisation, that it should ease back from its hard-hitting attacks on the protected manufacturing sector.

After the relatively short-lived world-wide commodity boom in 1973 the problems of New Zealand sheep-beef sector worsened. In 1976 Government said that 'It is clear that farm support policies such as we have had in the past while maintaining the farmer in business, have been unsuccessful in stimulating increased production'. The 1976 Budget contained a decision to introduce the Livestock Incentive Scheme. Just two years later the supplementary minimum price scheme was born. Its introduction was to be 'no more than an interim measure'. For the

longer term Government said it was 'prepared to discuss changes in the present price-smoothing arrangements with the producer boards'.

The S.M.P.'s had a stronger desire to survive than the then Minister of Finance had contemplated. They were not killed off until the conclusion on the 1984/85 season - 7 years later.

If the farmers were becoming increasingly in need of more Government subsidies their clamour for a more realistic exchange rate was not so evident, certainly prior to 1984. In 1948, when the New Zealand pound was revalued upwards by 25 per cent, largely on the insistence of the then President of the Federation of Labour, there was only a wimper from the farm sector. During subsequent changes in the New Zealand exchange rate the farm lobby was not vocal. Indeed it appeared that many of the older farm leaders recalled the devaluations of the 1930's - they believed that the farm sector was 'blamed' for bringing these about and had incurred a great deal of hostility from other sectors. One prominent leader once said to the author 'After that experience I shall never again advocate a fall in the exchange rate on behalf of the farm sector. Many took the view that a change in the exchange rate was an admission of defeat by Government. They were also obsessed by the view that the export sector could not gain from an exchange rate change - they were of the view that it was always self defeating. They insisted that costs always overtook any short-term increases in receipts.

For its part the then Government after 1975 was opposed to a deliberate devaluation of the \$N.Z. despite the fact that all the evidence pointed to the fact that the rate was considerably over-valued.

Instead the various subsidies were ladled out to compensate some farmers for the additional costs incurred through having to purchase locally made inputs, and to compensate them for an over-valued exchange rate. The exchange rate was considered too 'blunt' a weapon. In the memorable words of the then Finance minister 'A devaluation would reward exporters such as kiwi-fruit growers who are already receiving good prices!' As a result many industries including new ones with considerable export potential were denied some of the incentives given traditional products. This use or misuse of subsidies was tantamount to a differential exchange rate or a system of multiple exchange rates as practised by some South American Countries. The reaction of an outstanding young hill country farmer perhaps typified the understandable response of many farmers. 'I have long believed that goat farming was more appropriate for my land but I delayed switching to goats while Government was so generous in handing out subsidies for sheep production'.

By the 1984 Election the farm lobby had formulated an exchange rate policy. It asked for (inter alia). "The establishment of a realistic exchange rate incorporated with a package of policies to obtain the maximum economic benefits from the movement in exchange rate. Such a package should include:

- (i) The continued adjustment of the exchange rate to reflect the value of the N.Z. dollar through the adoption of a managed float exchange rate policy. While a managed float could occur in several forms, it is believed that this should be exercised through the Reserve Bank buying and selling exchange.

Government adjusted the N.Z. exchange rate downwards on 20 July 1984 -

this pleased the farm sector but the subsequent decision announced on 5 March 1985 to float the \$N.Z., while it initially was not opposed by the farm organisations has not generally proved helpful to the farming export sector.

Government's decision in 1984 to discontinue the various farming subsidies was accepted by the farm lobby but in the light of the appreciation of the \$N.Z. has had a traumatic impact on farm incomes and investment, at a time when world prices for many of our major products have declined. In May 1986 farmers were told by the Prime Minister that "no longer could it be said that a collapse of the farm industry would bring about a collapse of the New Zealand economy". Few who heard these words would ever have believed they would have application to this country. If the contention is valid it represents a major turning point in the role of farming in the N.Z. economy.

If we look back at the Budgets in the Post-war period almost all of them emphasised the key role of the farm sector which throughout was inextricably linked to Government economic policy making. If an enquiry were conducted into why the industry today finds itself in such an unsatisfactory position, past Governments and their policies would have to bear a large portion of the blame.

In his 1985 Reith Lectures David Henderson the British economist, now head of the Economics and Statistics Department at O.E.C.D., said "the history of national economic policies down the years bears witness not only to the influence of economists, defunct or alive, but also to the power of what I call 'do-it-yourself economics'". If the poorly performing British economy suffered at the hands of D.I.Y.E. - and Henderson demonstrates convincingly that it has - what of the New Zealand economy? There must be few countries in which D.I.Y.E. has had greater influence, when we consider the essential characteristics of this phenomena. Also, can we deny that the farm sector has not provided its share of practitioners of D.I.Y.E.?

Henderson cites interventionism, essentialism and autarchy as three characteristics of D.I.Y.E. No-one could dispute that New Zealand has had a super-abundance of this thinking and that as a result our economy today is a pale shadow of what could have been. I shall not quote examples of these three types of thinking. I would only add that in his reference to autarchic policies Henderson exclaims with some relief that many energy self-sufficiency programmes in the U.K. have failed or been abandoned. Regrettably we cannot make claim that ours were abandoned.

But, recriminations are unproductive, we must look ahead and consider some of the conditions under which agriculture can again prosper.

For what it's worth here is a 'shopping list'.

Unity

It is often alleged that the farm sector is one of the most disunited. When it is realised that there really is no such person as 'The Farmer' the reason for disunity is understandable. After all, there are really a whole range of different types of farmers - the Southland lamb producer - the Canterbury arable farmer - the Central Plateau hill country farmer, the Taranaki Dairy farmer and so on. Then there are farms of widely varying size and farmers with ages ranging from around the 30's to those over 60. Given such differences it is perhaps

remarkable that such a degree of agreement in policy has been achieved. But compared to other sectors there are massive differences not only in the situation but also the outlook of farmers. Their opponents are fast to seize on these differences. Ranks must be closed if the sector is to survive the threats to its future.

The Servicing of Agriculture

Many industries, trades and professions comprise that vital sector that has the responsibility of servicing farmers and farming. By international standards it could be claimed that some in the servicing sector are outstanding. But this could not be a generalisation. No doubt increased competitiveness will raise standards although inadequate demand could in some areas have the reverse effect.

Too often the sector servicing agriculture has not received the attention it deserves. At Lincoln College much greater emphasis is being placed on raising the efficiency of the agri-business sector - after all, a significant proportion of the College's graduates are destined to find their vocations in the sector servicing agriculture.

Downstream, in the centres processing and transporting farm output there are alarming shortcomings in their efficiency. The abolition of regulation and the increased competitiveness in the freezing industry should effect great improvements. But what of the transport sector, especially on the waterfront?

Last year I had the unique opportunity to witness, first hand, operations at 9 of the world's container ports through which some of our exports pass. These observations will be published sometime. Meanwhile I shall merely say that the Australian waterfront, through which many of our ships have to pass, is abysmal. If the Australian economy thinks it can afford the luxury of such appalling inefficiency that's its business. But I fear, New Zealand is having to share in the cost burdens that are implicit in the present state of affairs on the Australian waterfront.

Lessons to be learned from the industrial sector.

The application of modern management techniques has had a massive impact on the operations of successful firms in the industrial sector. There is scope for a greater transfer of these concepts, techniques and principles to the farm sector. For example in the control and development of the key human resource factor, some of the agricultural sectors are 'light' years behind modern management standards.

Another example is the division between ownership and management. Failure to accept this fact of life inhibits the acceptance and development of corporate structure in agriculture. Examples of the failure of farmers to 'stick to their lasts' are legion. Yet the division of labour as an economic principle is centuries old.

Many of the farmers' own organisations are classic examples of failure to 'keep out of the kitchen'.

If the farm sector wants to achieve greater success both in the farming firms or its own producer organisations it will have to be prepared to accept and adopt modern management principles.

Economic Research and Investigation

The author once had a conviction that if the leaders of the farm organisations were to be more effective they had the right to demand back-up from a first class economic team. This group would not only be concerned with research on immediate problems but also issues on or beyond the horizon. The team would comprise people of high competence who are inspired researchers and are self-starters.

As lack of finance was an effective bar to such a vision a campaign was embarked on to persuade Government to enact legislation for a special levy on livestock slaughtered. After a long and tortuous campaign victory was achieved in 1972. Today this levy yields around \$1.25 million. But meanwhile the price of economists appears to have risen astronomically. In 1984 the general-purpose farm organisation had, in its own words, 'half a full-time economist'. Today it has, I believe, one full-time economist. Perhaps this is yet another example of the power of D.I.Y.E. in this country?

It is well known that economic researchers in farm organisations are familiar with the words of those leaders who say, 'This is our conclusion, could you please prove it for us!' It requires a great deal of independence and intellectual integrity for an economist to survive in such situations. For a researcher to make the maximum contribution to the economic welfare of the members of a farm organisation he or she must be able to convey to the leaders that which they should know, not what they would like to know.

Perhaps however research is no longer considered appropriate as an 'all farmer' activity to be financed by a universal levy. According to the published audited accounts of our general-purpose farm organisation, expenditure on research in three recent years was as follows:-

Financial Year Ended 1983	-	\$6,248
Financial Year Ended 1984	-	\$1,607
Financial Year Ended 1985	-	\$11,713
Total		<u>\$19,568</u> =====

This amount of expenditure in today's financial conditions could hardly be expected to yield any shattering findings. Over the same period the 'all farmer' levy brought in \$2,692,442.

Stabilisation Accounts

In a more market environment is the need for stabilisation schemes greater or less? One would tend to affirm that the need for such schemes has now increased. But I detect a reduction in farmer desire for such arrangements, at least in their present form. There are various reasons for this. It could be the subject of a special paper.

Government played a major role in assisting and persuading the farm sector to establish the stabilisation arrangements. Perhaps the time has now arrived for the farm sector to evolve its own arrangements. It is also possible that individually-based schemes structured on the income-equalisation concept should be given more encouragement.

Internal Economic 'Climate'.

Since Government's market measures were introduced, agricultural economists have pleaded for a more neutral environment for the industry. It has a virtual incontrovertible case for such treatment. This is the goal that the farm sector should adopt.

Meanwhile the author believes the time has now arrived for the establishment of something akin to a 'Subsidies Commission'. This body would have the task of assessing and revealing the extent of subsidisation of the main sectors in the economy. It must be completely independent of Government and, like the Judiciary, be able to give its judgement fearlessly like any good referee. If the farm sector is to operate on a relatively fair basis in the future it must seek after a neutral environment. It cannot rely on politicians to ensure this. The late Sir William Polson, President of the New Zealand Farmers Union during the period 1922 - 1936, and a former Member of Parliament himself, said, in 1959, to a conference of farmers 'Never trust a politician!.

Financial Management

The crisis through which the farm sector has been passing over the last year has revealed several deficiencies, including the financial management of many farms.

The more-market environment in the future will demand that farmers spread their risks much more than in the past. This will require a dramatic reappraisal of some of their long established practices in financial management. The Universities and extension authorities must assist the industry urgently to meet the new financial situation confronting farmers.

Leadership

It is acknowledged that our farmers have achieved enormous advances in terms of technical achievement. They are very successful in producing meat, wool, dairy products, etc., of high quality and expanding quantities. Regrettably this has not, in the author's view, been paralleled by advances in areas such as sophisticated leadership skills.

The author decided in 1978 that a special scheme should be formulated and launched to develop leadership skills in future rural leaders. Thanks to the munificent generosity of a philanthropic U.S. Foundation a leadership training scheme was launched in 1979 at Lincoln College. Appropriately the Founder of the Foundation, Mr W.K. Kellogg's intention when he set up the Foundation was 'to help people to help themselves'.

So far almost 200 rural leaders have undergone the main course at Lincoln College and an even greater number have taken part in the mini leadership courses held in rural districts throughout New Zealand. Already Kellogg Scholars are taking an increasingly influential role in leading rural-based organisations in the country.

Within the ranks of the New Zealand farm sector are some of the most brilliant entrepreneurs in this or any other country. Past efforts by Government to seduce them with subsidies has not, fortunately, done irreparable harm. They will flourish in a more market environment.

But we have to ensure that the innovative and risk-taking qualities of the minority are spread to the majority of farmers. More effective leadership in the rural sector will help achieve this crucial aim.

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NEW ECONOMICS. IS THIS ONE WAY TOWARD ECONOMIC LIBERALISATION FOR THE RURAL SECTOR?

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SUMMARY

Various theoretical and practical details of New Economics are presented and then appraised from institutional, social, political and philosophical perspectives. Some of the policies for resolving the rural 'crisis' as presented by the Federal Government, the National Farmers' Federation, the Livestock and Grain Producers' Association and the Canowindra Rural Reform Committee are examined for their relationship to New Economics. The main conclusion is that self-reliance, inter-dependence and other elements of New Economics have the potential for facilitating the adjustment of the rural sector to a different set of relationships involving a new direction.

Key Words: New Economics, self-reliance, inter-dependence, rural adjustment.

AN EXPLANATION OF NEW ECONOMICS

Some Perceptions

The Other Economic Summit (TOES) was first held in June 1984 as an organised protest against the economic summit of the western Heads of Government. Since 1984 TOES has escalated with TOES 85 and 86 continuing the pressures and activities which are directed to the pioneering and projection of New Economics into the political and economic arena.

What is this New Economics and why is action and initiative by TOES taking place? Essentially it is operating under the belief that a shift to New Economics is a pre-condition of human progress. TOES 84 summarises the problem with the 'old' economics.

"The old economics is failing. Everywhere it is proving inadequate, irrelevant, counter productive. It's elusive concern with financial, statistical, non-human factors has resulted in unemployment in the west and mountainous debt and under-development in the South. It devastates the natural environment and depletes the planet's resources with no thought for the future. Conventional economics is today a prime cause of instability, insecurity and human suffering".

TOES 84 Summary

TOES contends that 'old' economics, which is essentially the conventions adopted by Western Governments, means a failure to recognise the true nature of problems facing societies world wide.

"TOES 84 defined the framework of a New Economics geared to personal development, social justice, satisfaction of the whole range of human needs, sustainable use of resources and conservation of the environment".

TOES 85.

Therefore New Economics would have the following features:

- promotion of personal development.
- satisfaction of a whole range of human needs.
- social justice within and between nations.
- conservation of the environment,
- working with nature,
- sustainable use of resources.

This perspective is consistent with Weston (1985 p.1) who indicates a number of synonyms for Green Economics - Alternate, Appropriate, Community, Human scale, Local and New¹ That is:

"Economics based on human need and ecological soundness, rather than profit or political maximisation. Politically, Green Economics is neither "right" not "left" (both of which tend to be centralised and bureaucratic), but is, rather, part of a decentralised symbiotic and synergistic network".

Weston p.1.

1. The term New Economics is preferred and is adopted throughout the paper.

Robertson (1983), in an examination of a new economic direction and a choice between different future scenarios, presented the Sane, Humane, Ecological (SHE) economic path as an alternative. This path is broadly consistent with the perceptions embodied within New Economics as presented above.

A further example of the different use of terminology in this area is provided by Harman (1985) who discusses green politics as the political expression of concerns about ecological perception, sustainable peace, economies with futures and participatory democracy that includes the grass roots of society. He suggests further (p.319) that these green political parties are characterised by:

- Wholeness.
- Ecological awareness
- Peace and nuclear disarmament
- De-centralisation
- Post-patriarchal perspectives.
- Trans-materialist beliefs.
- Social responsibility.
- Solidarity with the third world.
- Steady-state population and economy
- Cultural pluralism
- Non-violent change
- Empowerment of people.

A Theoretical Refinement

Galtung (1985) and Sachs (1985) have made contributions to the theoretical foundations of New Economics, especially in terms of self-reliance and global inter-dependence. Galtung regards economic theory as the root of the problem largely because of its intellectual appeal and its quantitative approach. With economics arising out of the growth of commercial groups, the church and the military, there has been a biased origin to the development of economics. Thus its restricted perceptions were there in the first place, with economic theory and practice generating limited horizons. In particular he contends that economics fails to take account of externalities. Galtung's view is epitomised by his contention that the omission of human, natural, cultural, historical and global environments and factors has left only one thing - an economist. Galtung draws two conclusions:-

1. Economic practice should be contracted making it holistic with everyone becoming aware of costs and benefits - self-reliance.
2. Economic theory has to become global, holistic and trans-disciplinary - global inter-dependence.

These tend to be polarised perceptions and therefore somewhat opposite in character. Sachs (1985), puts forward the following five hypotheses which he feels ought to be thoroughly examined when attempts are made to envision a new global order:

1. Local self-reliance can be considered the core of the eco-decentralist vision.
2. To win out on the world market can be considered the core of the superindustrialist vision.
3. Local self-reliance requires delinking from compulsory world market competition.
4. Selective delinking from the world market is indispensable for endogenous development in third-world countries.
5. Moving against compulsory export-orientation in rich countries serves to broaden political choices in both the North and South.

Self-reliance:

Galtung suggests that self-reliance has several features that need to be pursued. First, public debates about needs, especially in terms of what they ought to be and preferably through some means other than, or in addition to the market mechanism. Second, how these needs can be defined in the context of local production that can satisfy these needs. This also means depicting five factors of production, that is:

- i) Nature (land, raw materials, energy).
- ii) Labour (skilled and unskilled).
- iii) Capital (liquid and fixed).
- iv) Research (basic and applied).
- v) Administration.

For self-reliance to be enhanced, the positive externalities need to be preserved whilst the negative externalities should not be transferred to others. Galtung has the following basic rule:-

"... produce what you need using your own resources, internalising the challenges this involves, growing with the challenges, neither giving the most challenging tasks (positive externality) to somebody else on which you become dependent or export negative externalities to somebody else to whom you do damage (who may also become dependent on you)."

Galtung p.6.

The third feature means engaging in exchange so that the net balance of costs and benefits as well as the externalities are more or less equalised. For basic needs, self-sufficiency, as well as self-reliance should be a fundamental objective, particularly in terms of food, shelter, clothing and energy. His fourth point, is that self-reliance is psycho-economics as much as economics, and finally that it is not only a theory for nations but just as much a theory for local communities and regions.

Arising from the small is beautiful syndrome have been some detailed policy alternatives, as well as a realisation that it is not the panacea it was once thought to be. However -

"The alternative paradigm, at least in some countries, has firmly established itself in opposition to the conventional neo-liberal and social democratic discourse."

Sachs p.1.

Sachs distinguishes between the eco-capitalists who with their self-help welfare wish to overhaul existing structures allowing cleaner and healthier goods and services, and the ecologists who seek to invert super-structures whilst revitalising the self-sufficiency of local communities. Like Galtung, Sachs believe that local self-reliance is not just conservation of resources but a matter of re-considering market-based relationships. This he depicts as an inversion of market relations, first, in terms of scaling the exchange relations down and closing off the economic activities to within the local economy, and secondly, the stimulation of unpaid work and non-economic activities. What this implies is a different basis to economic security, where health, wealth and well-being stem from a reduction in national and international economic involvement with consequential increases in local activity. Therefore:

"... a market-enhanced self-reliance economy, should enable people to live gracefully with less money, less consumption and less wage-labour, because an infra-structure which is geared towards self-sufficiency will compensate for losses in income."

Sachs. p.2.

There are numerous examples, such as, free health and welfare clinics, traffic-free areas, community garden and nature areas, local community radio, ecological agriculture and collectives and co-operatives. Much of this depicts a new perception of conflict as being between centralised capital/labour versus local autonomy, in contrast to the more traditional perception of control which Sachs sees as being focused on the means of production.

Global Interdependence:

Both Galtung and Sachs extend their lines of argument on self-reliance to global considerations. Galtung's international perception sees the linking up of global interdependence and self-reliance in a balance-sheet approach. This simply means that any local community which wishes to be self-reliant should be able to seek out suitable relationships or partnerships elsewhere in the country or region, based on the premise that self-reliance means producing things for themselves rather than obtaining them through exchange. Thus by starting with local, more community based activities, new economics with its holistic perspective can be extended to more global concerns where there is exchange within the same sectors of economic activity, whilst including the objectives of self-reliance, self-sustainability, and self-sufficiency and at the same time maintaining the externality balance. By producing what is consumed, and consuming what is produced rather than exchanging, participants can benefit from the positive externalities, whilst being responsible for the negative externalities.

However, Sachs contrasts this to the modernising scenario which consists of a less polluting, material saving form of capitalism which has other avenues for profit making whilst implying greater power and control for industrialists, planners and scientists. There also seems to be a fear of any decline in international competitiveness because this would have implications for economic well-being and political loyalty. Hence the powerful coalitions supporting growth above all these. Sachs questions this apprehension about seeking economic alternatives and strategies to exported growth. For example:

- i) the reconversion of export-intensive industries.
- ii) the search for economies protected from the vagaries of the world market.
- iii) the examination of a low trade society.

Such strategies would involve becoming dissociated from the world market place, reducing export/import relations and thereby reducing vulnerability whilst opening up choices. Sachs contends that if the eco-decentralist can't find this economic and political space then:

"... we have to finally abandon the idea of a homogenous, unified market from the village to the global level, where the factors of production can be freely moved around, and to conceive of restrained markets, where political norms limit the scope and the range of market activities without emasculating their potential for innovation and liberty".

Sachs. p.5.

However Sachs is hopeful that a paradigm shift has occurred involving a movement from outer-directed to inner directed societies. This means a global space involving a highly integrated world but one where there are very many self-reliant and loosely inter-dependent worlds.

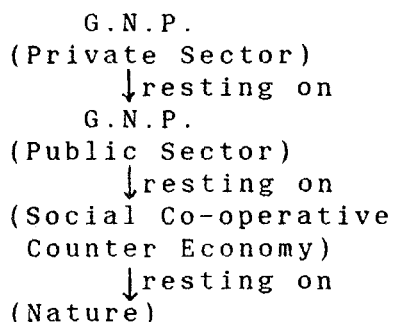
However what is deliberately left aside from these theoretical considerations are the more complex questions related to the values and perceptions present in alternative lifestyles or sustainable societies as discussed by Milbraith (1985)

Some Practical Developments

Much of the active development of New Economics in recent times has come through TOES. Separately, Robertson has specified the following features of a Sane, Humane, Ecological (SHE) society.

1. Energy and resources - the economic system integrated with the ecological use of resources.
2. Lower throughput, greater durability.
3. People first, things second.
4. Self-reliance and mutual aid.
5. A more decentralised economy.
6. A sustainable level of material consumption.
7. Technology as the servant.
8. Rural re-settlement.
9. Greater economic equality.
10. Work, leisure and life will be more integrated.

Each one of these is explained in greater detail in Robertson (1985 p.37-45). Many of these ideas also show through in the TOES programme of activity through 1984 to 1986. For example TOES criticises the focus of conventional economics on growth as a panacea. Economic growth is no longer a dependable policy option because growth is elusive and in westernised economics seems achievable only at the cost of increased indebtedness. This is not helped very much by the conventional measurement of economic growth which makes it an unreliable indicator of human welfare. The use of Gross National Product (G.N.P.) has been extensively criticised by Leipert (1985), Lintott (1985) and also Hazel Henderson (1985). Henderson depicts the total productive system of an industrial society as:



This criticism relates broadly to the exclusion of the non-financial benefits, especially those relating to the domestic and voluntary economic activities. Nor does economic growth measured in this way, account for resource depletion and environmental deterioration.

TOES have therefore identified a number of problems which they contend the industrialised nations of the entire left-right spectrum have not been able to resolve. That is -

1. The failure of traditional economic policies to create a sustainable economic base and sustainable patterns of employment.
2. The disparity between output generation and employment creation with the former increasing at a greater rate and the assumption that growth is the answer.
3. The increased consumption arising from sectors that grow without generating employment. Where jobs are created, they provide insufficient personal satisfaction and social usefulness.

4. The inadequacy of the full-time jobs for all concept, which means developing different concepts of work and worthwhile contributions. Work, self-respect and livelihood should not have to depend on paid full-time employment.

5. The inefficiency and inappropriateness of the labour market in organising work and distributing income.

6. The way the North has gained at the expense of the South, especially in terms of the multi-national domination of international trade which continues to exacerbate the disparity. This is re-enforced by the pro-capitalist nature of the I.M.F:

"...the Fund's role as that of messenger, watchdog, international alibi and gendarme for advanced capitalism whose bedrock is the private banking system, with the state acting as guarantor".

Susan George. p.2.

Such high consumption levels in the North are a factor in the poorer nations becoming poorer with greater unemployment and poverty.

7. One outcome of this international activity has been the depletion of and threats to natural resources including the natural environment and life sustaining capability of the biosphere.

8. The continued investment in the arms race drains economies, absorbs and wastes resources essential for more productive development and socially useful work and threatens global self-destruction.

The above points represent the basis of TOES's case for New Economics which is summarised by the following:

"Thus the personal, social, environmental and spiritual costs of pursuing indefinite industrial expansion (as measured by increases in GNP) already outweigh the material advantages of such a policy. Yet conventional economics, whether of Right, Left or Centre, seems incapable of identifying or evaluating these costs. It has become an instrument of impoverishment, blindly promoting ever-greater exploitation of people, resources and the environment, in ways that work against the interests of the vast majority of people".

TOES 85 Documentation.

In Hazel Henderson's view (1985.p.6.) voters in industrialised nations are becoming more aware that economics is nothing more than politics in disguise, whilst leaders have governed by being able to manage ignorance. The thrust of TOES's arguments are that in general terms, conventional economics does not adequately account for the nature of work people do or do not do, or their health and environment, skills, personal fulfilment or their domestic and family ties. New Economics therefore means the embodiment of the following:

"Real development requires sustainable ways of living. It enables people in rich and poor countries alike, to build up their own self-reliance in an environment under their own control."

TOES 85 Documentation.

Specific recommendations arising from TOES 84 and TOES 85 and the draft agenda¹ for economic recovery and world development are summarised below.

1. Food for all - in the short-term food re-distribution and in the longer term the development of self-sustainable food supplies.
2. Health for all - healthier lives and living conditions.
3. Trade for self-reliance and joint prosperity to allow all trading partners to meet human needs.
4. Alleviation of third world debt - the writing off of third world debt as the first step towards promoting sustainable, self-reliant strategies for meeting the real needs of poor people.
5. Regeneration of local economies - new policies that enable people to meet a larger proportion of local needs from local work and local resources.
6. Sharing and creation of work - including the promotion of industries based on conservation and renewable resources to allow new ways of sharing and creating work.
7. Human scale appropriate technology - encouraging their availability as well as the provision of education and training for their use.

1 This agenda with a covering letter was forwarded to the Heads of Government at the Bonn Economic summit.

8. Access to capital - new ways of providing access to financial and physical capital and to the broadening of the ownership and control of productive assets, thereby enabling more people to organise and control their own work.

9. Land reform - new ways of providing access to land that enables more people to work and live in more self-reliant ways.

10. Guarantee of a basic income - new ways of distributing personal incomes more equitably at a time when the lines between income and conventional employment are breaking down.

In essence TOES believes that better and more health, wealth and employment can be created through environmentally benign policies that generate qualitative growth.

AN INSTITUTIONAL, SOCIAL AND POLITICAL PERSPECTIVE

Consistent with a pluralist perception to this New Economics phenomena, are the numerous interrelated interest groups, some of which co-operate with TOES. As the previous section indicated, TOES is very much involved in the promotion of New Economics and it is expected to continue its efforts in relation to the search for New Economics as a major precondition of human progress. Such action by TOES and that adopted by other interest groups is also political in character, as the following brief descriptions of some other institutions, such as Business Network, Centre for New Economic Studies, Turning Point and World Food Assembly reveal.

The Business Network was founded in 1982 with a view to establishing a new approach to business theory and practice.

"Instead of the old values which had little concern for human welfare there had to be a humanistic holistic evolution in business before we destroyed ourselves and our planet."

Business Network.

There is an International Business Network with very similar principles and ideals plus the view that business should be defined as the right to use money for human welfare on a global scale.

The Centre for New Economic Studies describes itself as a forum and clearing house for the multi-disciplinary study of economic phenomena and for their evaluation. They also wish to formulate new economic concepts and translate them into practical applications and transferable models. What they are aiming to do is to demystify and update economic theory so everyone can understand it.

An institution with a much broader ambit is Turning Point, which is an international network for those people with a wide range of interests, that is:

"...environment, sex equality, third world, peace and disarmament, community politics, appropriate technology and alternatives in economics, health, education, agriculture, religion etc - but who share a common feeling that humankind is at a turning point."

Turning Point.

The objectives of World Food Assembly reflect very much the principles of self-reliance. It is a group that spans more than 200 organisations in 40 countries from a wide spectrum of interest groups and lifestyles. The World Food Assembly is seeking a sane alternative path that also challenges the power structures and conventional models of development. In summary -

"The World Food Assembly is a coalition of independent groups of people from all parts of the world, united in the conviction that radical changes are needed if we are to meet our human responsibility of ensuring food for all."

World Food Assembly.

That is, it is committed to development from within, constituting self-motivated growth consistent with the needs of the people and communities and sustainable resource use.

These institutions and other interest groups are critical of the free market concept and market forces as the basis to conventional or 'old' economics. Thus it is seen as concentrating on and perpetuating the myth of free market forces and consequential freedom of action and choice. TOES has demonstrated since its inception, the harmful impacts of this conditioned way of thinking, and accordingly, neoclassical market based economic theory is rejected as the *modus operandi*. As a result New Economics represents a challenge to westernised economics and capitalism and in particular is a challenge to the paradigm that embodies this conventional approach to economics.

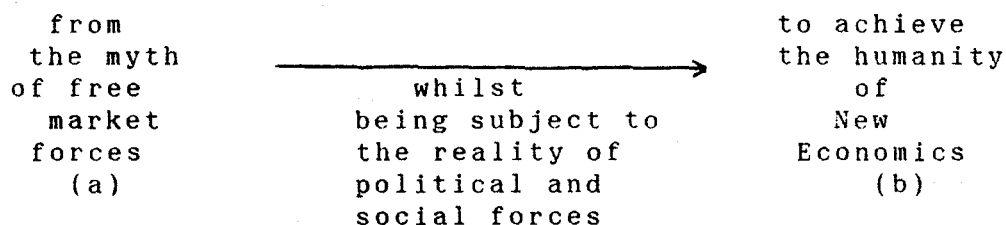
The development of New Economics and the dispersing of free market concepts allows the recognition of political and social entities and their incorporation into the New Economics paradigm. One interpretation would be to conceptualise the market as a 'place' representing political forces involving different groups and entities with different socio-economic groups each trying to negotiate something in their interest. Thus the economy could consist of various socio-economic interest groups each trying to achieve some degree of power and influence through the process of political interaction, using whatever power and coercion they possess.

New Economics, in this context, could be described as a pluralist socio-economic phenomenon, representing different power bases, and the interplay of different interest groups with the ability to coerce or negotiate according to particular circumstances.

Recognising a power-based socio-economic system such as this also means recognising the way free market forces are used as a conditioned instrument of power, to circumvent an understanding of reality. For example, free market forces are perpetrated as the panacea to combat power, when the market itself is power based. Galbraith's (1984) anatomy of power with the sources of power lying in personality, property and organisation and his instruments of power as condign, compensatory and conditioned provides useful clarification.

This reasoning can also be applied to economic regulation where government and centralised authorities can be depicted as power phenomena and not just an aberration or interfering force within a presumed free economic system. As a reality they are similar to the term externalities and should therefore be conceptualised as within the economic system which is itself, political and social in character and substance and where power, interest groups, economic regulation, policy making exist and are interrelated. Achieving this aspect for New Economics will itself mean some form of power based strategy using Galbraith's frame of reference and his instruments and sources of power.

In Kuhnian philosophical terms, the paradigm shift to New Economics could occur by revolutionary means, challenging the status quo of conventional economics. However, conventional economics, because of its power is well-entrenched. This represents a major problem in getting:



New Economics as a holistic and pluralist discipline would recognise a shift away from centralisation and towards decentralised interest groups. Such an economics is also consistent with the Singerian philosophy of self-recognition, as well as pluralism, power and the generation of structures, concepts and policies that facilitate the interaction of interest groups and power. It would also permit an economic structure that facilitates the development of self-reliance and inter-dependent links.

Therefore New Economics emphasises a holistic integrative and multi-disciplinary entity that incorporates personal development and values, satisfaction of a range of needs, conservation and sustainable resource use, social justice and economic self-reliance. It may even include a spiritual entity.

However, there are some practical difficulties. Government could facilitate new economics and self-reliance in this new economy, with collective needs and concerns involving a new form of governing relationships. This means conceptualising 'macro' and 'micro' self-reliance or more appropriately a scale of self-reliance involving the nation as a whole through to localised groups. Within this, profit would be out-moded as an absolute criterion, because values and needs would be more adequately reflected within new economics. There is also the problem of getting through the paradigm that has become entrenched and conditioned through socio-cultural materialism, education, tertiary training and which is re-inforced by those who are in powerful positions, including government itself as well as business, related interest groups and the various economic professions who follow the 'old' economics paradigm with conventionalist and conditioned frames of reference.

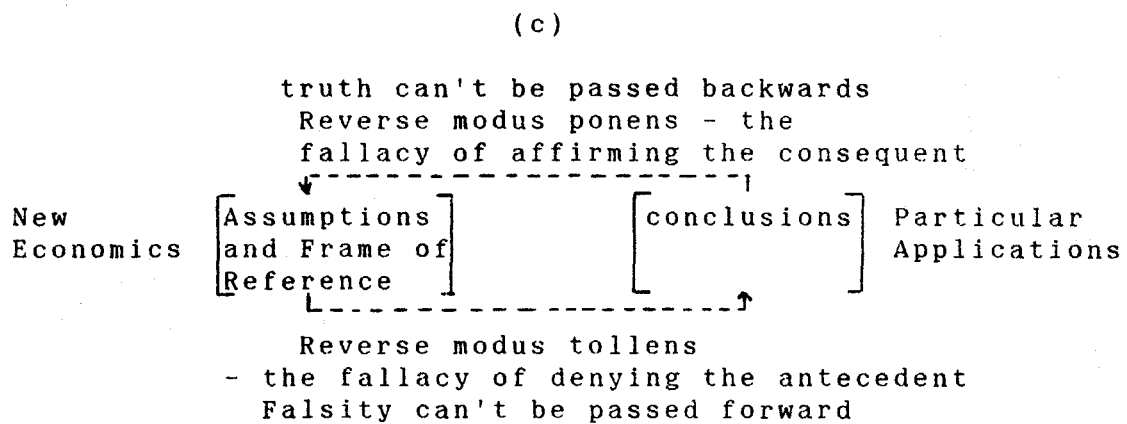
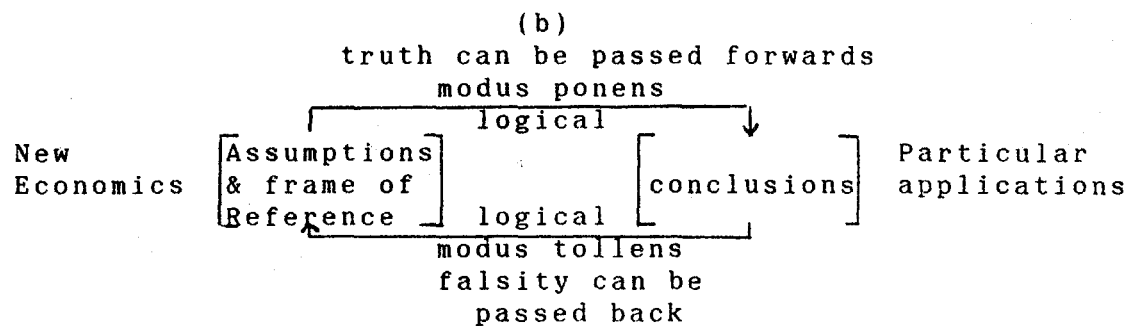
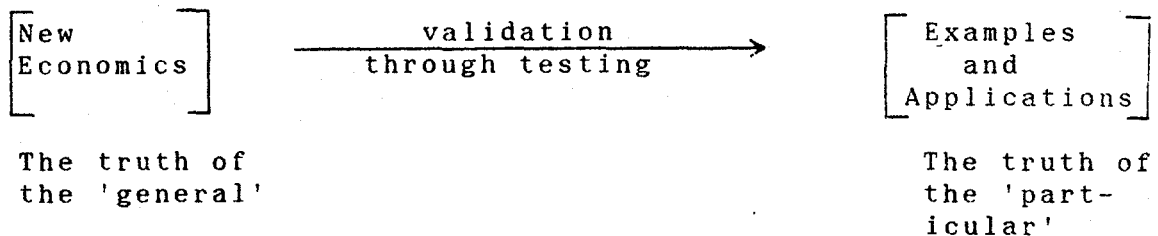
A PHILOSOPHICAL APPRAISAL

Figure 1 is a simplification of a philosophical appraisal of New Economics. What this presents is first a deductive appraisal of the logic of New Economics, that is 1(a) where the analysis is from the general (New Economics) to the particular (specific examples and applications).

This is continued into 1(b) and 1(c) which shows this process in terms of the logic of modus ponens and modus tollens. Previous sections revealed the general frame of reference of New Economics as well as the particular efforts by TOES to get it implemented. Several familiar examples were also referred to; that is, free health and welfare clinics, traffic-free areas, community nature reserves, local community radio, ecological/organic agriculture and collectives and co-operatives within this deductive process, further validation of the practicality of New Economics, is provided by the following examples and applications, presented at TOES 85.

Figure 1

The Logicality of New Economics
(a)



1. S.E.W.A., the self employed Women's Association in India who seek self reliance for piece-rate workers: Ela Bhat (TOES '85)
2. The environmental and socio-economic aspects of different farming practices: Harmut Vogtman (TOES 85)
3. De-medicalisation and community based health programmes in the USA: John McKnight (TOES 85)
4. Indigenous health care in India and the conflicts with westernised medical practices: Mira Shiva (TOES 85)
5. A British Columbian example of the community use of currency: David Weston (TOES 85)
6. The green belt movement in Kenya as a building block for sustainable development: Wangari Maathai (TOES 85)
7. The shift to organic agriculture: Bateman and Lampkin (TOES 85)

Under *modus ponens* and given the assumptions and frame of reference of New Economics it is logical to say that New Economics can be applied. However the reverse of this would be a logical fallacy, that is it is illogical to state that because particular examples of New Economics are successful (that is, 'true') that New Economics itself is therefore true. If it were the objective then *modus tollens* would also be logical grounds for philosophical appraisal through the process of falsification.

This philosophical appraisal with the emphasis on the links between New Economics and the numerous applications cited above show that there are logical grounds for validating its practicality and potential. It also demonstrates how New Economics is a further challenge to the application of traditional, neoclassical economics.

THE RURAL IMPLICATIONS OF NEW ECONOMICS

The Activities of Rural Interest Groups

In a perverse sense there are plenty of opportunities for implementing elements of New Economics in Australian agriculture. These opportunities can be attributed to the intense debate surrounding the rural crisis which has highlighted discussions about the future directions of agricultural policy, the rural sector itself and its role, importance and contribution to the Australian national economy.

There are a number of rural interest groups involved in this debate, including the Federal Government itself, the National Farmer's Federation (N.F.F.), The Livestock and Grain Producers' Association (L.G.P.A.) and the Canowindra Rural Reform Committee, to single out just a few. Throughout 1985/86 there have been a succession of farmers' meetings in the 'bush' which have focused on their rural difficulties. Associated with this has been various expressions of militancy, including a march on Canberra on July 1st 1985. This activism has been taken up by the Canowindra Reform Committee, perhaps the more radical of all the interest groups. As befits a pluralist interpretation to activism, various degrees of pressure and coercion directed at Federal Government, contributed to the Government's Economic and Rural Policy being presented to parliament on April 15 1986. Leading up to this the N.F.F., whilst supporting the aggressive actions of rural interest groups, retained its dialogue with Federal Government. They were seeking the following measures as critical to an improvement in the financial position of farmers:

- . full flow-on of Import Parity Pricing so Australian consumers pay the world price for fuel;
- . tariffs off all agricultural inputs, with chemicals as a first step;
- . a reduction in interest rates by freeing up the money market;
- . cancellation of the next two proposed National Wage Cases;
- . scrapping of the proposed capital gains tax and restrictions on offsetting farm losses.

N.F.F. Newsletter 1985.

The L.G.P.A. however made it quite clear in early October 1985, (Rich 1985) that they would actively campaign for the downfall of the Hawke Federal Government. Much of the basis for this decision was the objection to the Federal Government's taxation package and other policies that were affecting farmers. More active and more militant strategies were adopted by the Canowindra Reform group who proposed a series of economic measures with the following objectives:

The objectives are:

1. Free float of the Australian dollar.
2. Lower interest rates.
3. Compensation for agriculture subsidising other industries through tariff protection.
4. Compensation for Government policies past and present which have discriminated against agriculture.
5. A moratorium on all rural debt to be maintained until the package is in place.
6. Injection of funds for restructuring of agricultural debt at minimum interest rates.
7. Removal of tax on fuel for the productive sector.

These also included the proposition that Federal Government borrow \$3b. off-shore. Clark¹ has substantially criticised these measures as well as the notion that there is a rural crisis. However the views of many farmers can be summarised by the Werris Creek farmers' meeting of late September 1985 (Lindsay and Metcalfe, 1985), which was one of a series of such meetings across rural Australia. The general conclusion was that the farm was 'terminally ill'.

What all these interest groups have failed to appreciate is that there is an alternative direction for rural policy measures, in situations where structural re-adjustment is necessary. A major requirement would be for the interest groups referred to above to stand outside their traditional frames of reference, paradigms and parochialism. There are excellent opportunities for achieving greater self-reliance and developing inter-dependent links, based on the principles and directions provided by New Economics. Operating within this ambit would itself see a considerable degree of liberalisation for the rural sector, but not necessarily in the sense of this term implying extensive de-regulation.

Implicit within much of the rural activism is the element of agricultural fundamentalism, which sees a focus on agriculture for its own sake. However these considerations are distinct from the agrarian socialist rhetoric of former years. For example, with the N.F.F. there is a much greater degree of economic realism. However, in identifying these frames of reference, it is important to appreciate that the Federal Government itself acts within the general guidelines of economic rationalism.

1. An economic journalist with the Australian Financial Review.

This means it is concerned about economic efficiency within a competitive environment involving less protection with any economic adjustment being undertaken by the industry itself, that is, self-direction. Government thus has the role of facilitating this adjustment with the re-distribution aspects being left to the political process.

Sarah Sargent (1985) contrasts this to the more welfare, socially oriented, environmentally based perspective, which is also concerned with the power of institutions as well as the distributive effects of economic policy. The Economic and Rural Policy package of the Minister for Primary Industry is broadly consistent with economic rationalism, as the outline of the Federal Government's strategy would indicate. This consists of five major elements:

1. Action directed at:

"....achieving sustained growth of the economy at large, with lower inflation, and at enhancing the ability of all sectors to compete in world markets"

Commonwealth of Australia p.7.

2. "....a more rigorous and outward-looking industry structure."

Commonwealth of Australia p.7.

3. Reduction of off and on-farm costs with a view to greater economic efficiency, the reduction of dependence with an emphasis on growth and de-regulation.

4. There will also be a major effort:

"..at both international and domestic levels to tackle adverse developments in the demand for specific rural commodities."

Commonwealth of Australia p.7.

5. Addressing the welfare problems of the rural sector.

These essentially mean that Federal Government wishes to see some progress being achieved with:

- the development and implementation of international trade and economic policy;
- agricultural marketing reform and improvement especially in difficult circumstances;

- improved transport and handling from the farmgate to the consumer;
- reduction of regulation with on-farm and off-farm costs;
- improvements in the comprehension and effectiveness of rural research and development and the stimulation of innovation and diffusion;
- product development and differentiation.

Commonwealth of Australia p.88.

What is the Federal Government's approach to policy? It is not surprising that they are concerned with the economic and political realities of objectively appraising facts and options and the negotiation and implementation of sound programs. They are also interested in the possible trade-offs between their strategies and the difficulties facing farmers, but their concern (Commonwealth of Australia p.8.) is with maximising the farm sector's contribution to the overall performance of the national economy. However, it is fairly clear that the Federal Government's approach is strongly consistent with the economic rationalist perspective.

"Indeed for the most part, the adjustment needed to cope with the harsh economic realities that we now face will be undertaken by individual rural producers throughout country Australia."

Commonwealth of Australia p.8.

In summary, the Government sees itself as a catalyst in facilitating adjustment, whilst accepting a pluralist perspective that allows a participative and consultative approach to policy making.

An alternative to economic rationalism is clearly the more welfare and socially oriented approach mentioned above, which could be implemented given the future extent of the rural crisis and possible electoral considerations. These polarised perceptions between this and economic rationalism do not adequately reflect other directions that could be undertaken, because they have not been explicitly recognised by any of the interest groups mentioned so far. These directions are those falling within the ambit of New Economics and its potential application as a liberalising force in the process of rural adjustment. However a major factor influencing this scenario is the need for a fundamental change or shift in attitude and perception beyond traditional boundaries and paradigms.

A Consideration of New Economics For Australian Agriculture

There is an opportunity for implementing rural adjustment policies based on New Economics, including greater self-reliance and the development of inter-dependent links. It is quite apparent how the Economic and Rural Policy of the Federal Government is dependent upon the international trading and internationally competitive economic environment. This reflects somewhat traditional economic perceptions as the following statement indicates:

"Improved export performance is needed to finance expanding imports, to help reduce our excessively large current account deficit, and to lift family living standards on a permanent and sustainable basis."

Commonwealth of Australia p.6

Bateman and Lampkin (1985) contend that the 'patching' of agricultural policies is no longer defensible and revolution rather than evolution is necessary. In their view the first step in the development of new policies is an explicit statement of objectives. Bateman and Lampkin (1985, p.5) establish such a set of objectives which they use to assess the role of organic farming.

- "1. To produce in each region that part the region's food that it is desirable to produce in that region having regard to:
 - * the needs of other rural land uses, in particular, forestry, conservation and recreation;
 - * the stability and prosperity of rural areas and equity of income distribution within them;
 - * the nutritional needs of the population;
 - * the long-term productivity of the soil;
 - * environmental damage and the use of non-renewable resources;
 - * animal welfare.
2. To achieve this without imposing an undue burden upon taxpayers or consumers within the area, and with regard to the agricultural and nutritional needs of people living in other areas."

To what extent could these objectives be met within the broader ambit of a New Economics based agricultural system? Such a proposition should be comprehensively evaluated in an

Australian context and therefore with existing farming systems. Newby (1985) in analysing the future of rural communities in the United Kingdom, indicates how the growth of agribusiness has contributed to the emergence of a dual farming structure where a declining working agricultural population has been replaced by an increasing middle class. Sargent (1985) has highlighted the growth of agribusiness in Australia, indicating that it currently accounts for some 35 percent of Australia's G.D.P. However, its social impact is less clear, although these aspects of Newby and Sargent raise a number of questions, which could have specific implications for New Economics as a means of liberalising Australian agriculture. For example:

- How can balanced rural communities be achieved?
- Is over-production a rural problem and what does it mean as a concept in the context of New Economics?
- Should Australian farmers be paid to conserve or preserve the landscape?
- Would there be any discernible rural criticism to the development of New Economics in Australia?
- What is the discriminatory nature of existing rural policies?
- What policy options should be introduced to encourage a shift to greater self-reliance?
- To what extent should New Economics influence and change the stability and prosperity of rural communities and their income distribution?

Bateman and Lampkin suggest that in the context of organic farming, the objectives specified previously could be achieved through several means. First, through changes in farm product prices, secondly through changes in the prices of farm inputs and thirdly, by physical control which would facilitate environmental needs whilst assisting those farmers that already operate in this way. Finally, they suggest a research advisory system that re-orientates priorities. These suggestions remain within the bounds of traditional economics and they fail to account for the non-price factors and alternative considerations that could be reflected by means other than the operation of the price mechanism and the generation of incentives through higher prices. This is because there are a multiplicity of objectives within an institutional and political process that would not necessarily be satisfied by operating strictly through the price mechanism.

In addition to establishing some answers to the questions posed above, New Economics, by introducing change to the Australian rural sector, would need to pay some attention to such issues as:

1. The re-structuring of agricultural production.
2. The re-focusing and re-generation of rural communities and economies.
3. The determination of the social needs and demands for all representative groups and classes.
4. The minimum provision of services to facilitate the above.
5. Planning to achieve a balance in rural communities which includes participation as a priority.

Whilst there has been some research into alternative lifestyles and associated communities in Australia, for example, on rural land sharing communities by Sommerlad et al (1985), on the social characteristics of alternative lifestyle participants by Metcalf and Vanclay (1985) and related research by Metcalf (1984), and Metcalf and Vanclay 1984(a) and (b), this remains a somewhat restricted perception of the overall application of New Economics, which is broader in concept. However, there is little doubt that within a deductive frame of reference, alternative lifestyles fulfil some of the basic ideals of New Economics. It is open to question whether this type of alternative lifestyle is the vehicle for achieving the total change that TOES has envisaged.

In the Australian rural context the pressures being imposed upon rural communities could lead to some fundamental societal and economic re-structuring. If the rural sector is facing a turning point, then one potential direction is the emergence of new societal systems involving different perspectives to the nature of work, employment and the way communities are organised and operated.

Self-reliance:

This is a major theme within New Economics and would represent an important part of any societal and economic changes. The emphasis is on greater economic self-reliance for people, first as individuals and also collectively in an environment which is under their own control. This means changing the concepts of rural work, rural production, as well as money as the only basis of exchange.

With self-motivated growth by people and communities, there would be a greater emphasis on local enterprises and self-reliance in local economies so that they can meet a greater proportion of their needs.

What this implies is that there is an alternative strategy that could be adopted by the various interest groups involved in the establishment of Australian rural policy. Therefore, why not consider some adjustment towards greater self-reliance for the rural sector, with active encouragement being given to diversifying sources of income and livelihood. This would include the development of inter-dependent relationships with such groups as agricultural commerce. The development of such self-reliance would also represent a movement away from excessive dependence on adverse trading relations, particularly those that could be symbolised by the dominance, exploitation and power play of the North over the South. In terms of rural communities themselves, the aim would be a more self-reliant and self-sustaining rural community.

Needs and Demands:

In the context of New Economics, self-reliance means recognising individual and community needs and their satisfaction as well as personal development and fulfilment. This also means understanding the relationship between these various needs and the different ways they could be satisfied. Implicit within this is a better understanding of economic reality as well as better measures of wealth, health and human well-being in the rural sector. Incorporated is a local rural focus which would aim at self-sufficiency and self-reliance for rural communities.

Accountability:

By being more self-reliant there is also a need to be aware of multiple economic effects which means accountability and social justice would be a normal component of the application of New Economics to the Australian rural sector.

Ownership and Control:

Self-reliance means broadening the ownership and control of productive assets with improved access to financial and physical capital so that people and communities can control their own work. With greater access to rural resources and changes in the nature of work there could be implications for the way income is distributed, let alone perceived.

Global Concerns:

Self-reliance means explicitly recognising global considerations because as a concept self-reliance involves the formation of inter-dependent links. Such links could be extended internationally, for example, in ensuring there are food supplies for all. The Australian rural sector by being self-reliant should not then ignore and nor should it isolate itself from such fundamental issues. However, on the other hand the Australian rural sector may choose to isolate itself from the heavy dependence on rural trade with the Northern Hemisphere and thereby form a new set of inter-dependent links consistent with the development of global self-reliance.

A Summary of the International Implications.

Why should there be apprehension about the generation of policies and strategies that:

1. re-convert export-intensive industries;
2. seek economic protection for Australia from the vagaries of the world market;
3. wish to establish a low-trade society.

New economics as well as these global perceptions, if implemented with Australia in mind, clearly imply major adjustment problems for the rural sector. What New Economics is arguing for is a strategy that dissociates Australia from being exploited by Northern world markets. This means a scaling down of export/import relations and therefore less vulnerability to international crises, ultimately allowing for greater insulation and internal stability. In turn, it would permit the development of inter-dependent relations and links within the ambit of New Economics. It would also permit the examination of a variety of opportunities in domestic development. Therefore, serious consideration ought to be given to the next generation's agricultural system in Australia, based on New Economics as a major liberalising force.

Sachs (1985,p.6) contends that the third world is becoming increasingly irrelevant and almost redundant for the reproduction and maintenance of the industrial systems in the North. This implies that there is something rather mythical about a world based on free trade. In the context of New Economics, the only real solution is for the South to de-link from the North and to develop and form relationships amongst themselves.

Such a rationale could also apply to Australian agriculture, which could then develop economically, culturally and socially without depending on the North as perceived in terms of the trading activities of the E.E.C. and North America. Shifting to a more sustainable agricultural system also allows less reliance on the world market place and the international power elites. The North-South agricultural focus is thus a synonym to the traditional North-South perception of the first and second worlds in the North dominating the third world in the South.

Chambers (1985) who examined the professional (the 'first') and their role in advising the third world (the 'last'), contends that one of the major difficulties with scientists and other professionals is that they are conditioned to learning from above and to being imposed upon within a hierarchical frame of reference. When things go wrong or are inconsistent with these perspectives, there are natural defence mechanisms. In Australia, a shift to New Economics has very similar parallels to 'first' - 'last' thinking and would involve a paradigm shift.

That is:

"To adopt last thinking, first professionals have to suspend much that makes them feel secure."

Chambers, p.15

In essence, the implications for Australian agriculture are:

1. more active learning from 'below';
2. a different set of priorities upon which to operate;
3. a more specific focus on the needs of the rural community.
4. a determination of research programmes and priorities based on New Economics.

CONCLUSION

An explanation of New Economics has been presented and subjected to a social, political and philosophical evaluation. Also acknowledged are a number of rural interest groups, including the Federal Government who have nominated various policies and strategies for dealing with the rural crisis. Much of this is embodied within traditional economic rationalist frames of reference.

As a consequence many of the key elements encompassed within New Economics do not rate much mention in these proposals. But it has the potential to be a major liberalising force and given that the rural sector is facing major structural adjustment, it is very opportune to thoroughly evaluate New Economics as a vehicle for facilitating this change to a new and different set of relationships.

Is New Economics one way toward economic liberalisation for the rural sector? The main conclusion is that it certainly has the potential to achieve this. Actually instituting it however, is a different matter. As a phenomenon it is likely to continue its momentum. Taking Harman's (1985) discussion on Greens movements provides some degree of confidence in this momentum.

"..... Green politics can be viewed as the political manifestation of a much deeper current of change involving other related cultural and social movements in the industrialised countries as well as global factors and attitudes in the developing world."

Harman p.329

That is, whilst Greens movements themselves may disappear or change, the phenomenon of New Economics is representative of broader cultural changes that will not necessarily diminish

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