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FINANCIAL ANALYSIS OF MAFTECH BULL BEEF INVESTMENT OPPORTUNITY

A research report presented in partial fulfilment of the requirements for the degree of Master of Business Studies at Massey University

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Year: 1989

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ABSTRACT

MAFTech has established an investment opportunity whereby a non-farming investor can provide the capital required to farm bull beef. The farmer and the investor share the returns from the investment, with the investor having a first charge over the proceeds received from the sale of the beef up to the amount of the initial capital injection.

This type of investment scheme differs from more conventional form of investment. However, in order to compare this scheme with the more common forms of investment it is necessary to evaluate it to enable an optimal investment decision to be made. Hence the market for the production of bull beef is appraised. The risk involved in this investment is outlined and a sensitivity analysis to changes in price and weight conducted. Using this risk and return information a comparison with other investments is then made.

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CONTENTS

INTRODUCTION

A farm is a business unit and like other businesses in New Zealand, this industry has undergone dramatic changes in recent years. To cope with the changing environment, businesses must be adaptable. Recently many farmers have faced financing difficulties. To assist farmers in these difficulties alternative methods of financing have been devised.

Traditionally the farm unit has been financed through mortgaging and as such has carried high debt levels. As interest rates have risen, many farmers have had difficulty bearing the large debt burdens they have been forced to incur. The solution lies in a reduction in Debt and an increase in Equity.

Various schemes to increase the Debt-Equity ratio in the farming sector have been developed by those associated with the agricultural industry. Lincoln College has devised a joint farming scheme. The objective is to share not only equity but also, by extension, risk and returns. Under this scheme, the owner retains ownership of the land and buildings and the sharefarmer buys the stock and plant with the owner having an option to repurchase at the termination of the contract. Farming decisions are made jointly[1]. However under this scheme there is still a high level of exposure to interest rates,

1 Johnson, [9], p75.

although the exposure is shifted marginally from the owner to the sharefarmer.

The agricultural industry has traditionally been exposed to large debt burdens as financing has not been undertaken in the same manner as other industries. The nature of farming has traditionally precluded raising capital through the flotation of equity issues as is done for other industries since the transaction costs involved in floating a company for each individual farm and listing it on the Stock exchange would be prohibitively high. The value and uses of properties in different districts are broad, requiring expert valuation. The remoteness of many properties would make this a costly and difficult exercise[2].

As the company form of business is impractical and costly for the farming business unit, MAFTech has devised an alternative scheme to enable equity investment in farming. At present the MAFTech scheme is confined to Bull Beef investment and it is this particular scheme that will be analysed. However, there is a proposal to expand the scheme to other types of farming such as Merino sheep and dairy cattle[3]. In this paper the terms and operation of the investment will be detailed. The economic situation in New Zealand that has given rise to the development of this scheme will be investigated as will the implications for the beef industry. The present and potential markets for beef raised under the scheme will

2 Johnson, [9], p70.

3 The Dominion, [3].

be examined before undertaking a financial analysis of the investment itself.

CHAPTER I

THE INVESTMENT

In analysing any investment scheme it is vital to fully understand the mechanics of the scheme as will the rights and obligations of all those involved. In reaching an understanding, the objectives of the scheme will then be made clear. The relationships between each of the parties may then be explored to define the role of each in the scheme and the risks to which they are exposed.

OBJECTIVE

MAFTech has designed an investment to enable farmers to run bull beef on their farms without requiring a large capital injection on their part. The non-farmer investor purchases the stock and is termed the 'owner'. The 'owner' contributes the capital cost to the venture. The farmer grazes the stock and thereby contributes his land, labour and expertise. MAFTech operates in an advisory role; that is, it is an intermediary between the two. The objective is to stock farms at a zero or low capital outlay by farmers. A third party bears the costs.

CONTRACTUAL RELATIONSHIPS

1. BETWEEN THE OWNER AND THE SHAREFARMER

This contract states that within a maximum period of 18 months the farmer will agree to deliver for slaughter a bull with a minimum carcass weight of 220kg. The stock purchased at the outset are three month old weaners with a minimum liveweight of 80kg. The weaners are purchased in November and then grown for 15 months.

Therefore if an investor were to invest in November 1989, the return would not be received until February 1991. Included in the contract are the schedules of stock farmed and the obligations of each party. The weighing procedure and payment methods are also laid out in the contract. The details of the contracts are listed in the prospectus (See Appendix Two).

The owner's original investment is secured by a first charge on the proceeds of the sale of the stock after MAFTech receives its fees and charges. This may be contrasted with a purchase of shares which offers a residual claim in which the original investment will be recovered only if there are sufficient assets upon liquidation. A debenture investment generally carries a charge over the company's assets. However, as has been seen in recent times by the collapse of such companies as Goldcorp and Equiticorp, this is not always sufficient to ensure the recovery of the initial investment, under New Zealand receivership law.

The 'original investment' is the amount paid to purchase the stock. The profits are split 70:30 in favour of the sharefarmer up to 220kg carcass weight and 90:10 in favour of the farmer above this weight.

2. MANAGEMENT CONTRACT BETWEEN MAFTECH AND STOCKOWNER

In this contract the owner's responsibilities and MAFTech's obligations are detailed. That is, MAFTech:

a) approves the farmers who are to participate in the scheme; and,

b) operates as the owner's agents.

In their capacity as the agents, MAFTech staff purchase the stock, arrange delivery and identification, and compile a minimum of three progress reports to the owner during the growing period of 18 months.

3. BETWEEN MAFTECH AND THE SHAREFARMER

The contract between MAFTech and the sharefarmer details MAFTech's obligations and the sharefarmer's responsibilities. MAFTech staff agree to act in an advisory capacity concerning management and husbandry of the stock involved.

RISK

MAFTech has attempted to reduce risk by dividing the contract into two groups of 50 beasts with each group farmed by different farmers. The first charge on proceeds and MAFTech's intermediary and advisory role are also intended to reduce investment risk.

The profits, and therefore the final returns to the investor, are dependent on beef schedule prices and the weight of the bulls. These factors are themselves the product of many variables, including demand in the beef market, retail prices, trade restrictions, foreign exchange, availability of feed and climatic conditions. Obviously with so many variables involved a relatively high level of risk exists.

CHAPTER II

ECONOMIC ANALYSIS

When considering any investment opportunity it is critical to judge it in view of the expected economic conditions that will prevail over the period of investment. This enables an optimal investment decision to be made, given the expected economic conditions. For example, it has been found that shares perform best when there is low inflation and real economic growth[4]. Bonds offer best returns during deflationary times and bills are preferable during inflationary periods as they provide a hedge against inflation[5]. The investment under consideration is of 15 months duration and it is therefore necessary to determine the economic expectations over this period.

The New Zealand economy has undergone drastic change during the restructuring which has taken place in recent years. Since the election of the Labour Government in 1984, a general policy of deregulation has been followed with the intention of producing a freer market economy. These economic changes have caused considerable uncertainty. The result has been that economic indicators have been extremely volatile. For example, the government's disinflationary monetary policy has reduced our inflation rate to a level below that of three out of four of our major trading partners[6]. Yet, both

4 Farrell, [6], p184.

5 Ibid.

6 Reserve Bank of New Zealand, [26], p3.

nominal interest rates and unemployment have remained high.

One factor which has prevented the fall in interest rates, and which has prevented a decline in unemployment is the political instability which New Zealand has experienced recently. The Labour Government has been plagued by divisions amongst its members regarding policy and direction. As a result of these differences some Cabinet members have been relegated to the back-benches and "break-away" divisions of the party have been formed. As the various factions have struggled for power, there have been reversals and alterations in policy, all of which has left the country in a state of considerable uncertainty. For example, there has been contradiction over the introduction of both capital gains tax and a flat tax rate. The implications of the introduction of a capital gains tax are particularly relevant to this investment scheme as the return is solely in the form of capital gain. The return is a function of the price appreciation of the bulls as they grow over the period of investment. No interest or dividend income is paid. Such political uncertainty has caused a high risk premium to be placed on long-term interest rates.

With so much instability and uncertainty, business confidence has been undermined. The tax system has undergone many revisions under the present government. As a result firms are unwilling to commit themselves to any large or long-term projects since they are uncertain as to how long the present policies will remain intact. The net effect of such political upheaval and economic uncertainty is that capital growth has been restricted. This, together with reduced

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economic activity and the present governmental economic policy, has resulted in a high unemployment rate with 7.4% of the workforce, or 116,300 workers out of work. This is part of continuing upward trend in unemployment[7].

With such a large proportion of the workforce unemployed, disposable income has been reduced so that demand for non-essential items has fallen. The decreased demand provides little incentive to increase investment and therefore has retarded growth in production and capital. This fall in demand has been compounded by high nominal interest rates. These high rates have increased the marginal propensity to save and reduce debt, and together with declining real wage incomes, have decreased the propensity to consume[8]. This slackening in demand is often cited as the main factor preventing an increase in production[9] This depressed level of demand has meant that economic growth has slackened. This lack of growth is shown by the fact that Real Gross Domestic Production (GDP) has risen by only 0.6% in 1988-89[10].

New Zealand's economy has been slow to recover from the 1987 sharemarket crash. Some overseas markets have recovered and some have surpassed their pre-crash levels but New Zealand's recovery has been compounded by its other economic problems. Investor

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7 Westpac Economics Department,[30], p7.

8 Ord O'Conner Grieve, [22], p5.

9 NZIER Quarterly Survey of Business Opinion, [21], p1.

10 [NZIER, [20], p5.

confidence has fallen as many investors, both small and large, lost money not only in the sharemarket crash but also with many companies that have failed since.

Recently the New Zealand economy has begun to turn around. The July 1989 budget restored some confidence in the market place. Together with the change in the leadership of the government, this appears to have been perceived by financial markets as an indication that stability is being reintroduced to the economy. These events have infused the desired confidence into the marketplace, and this in turn has been reflected by the increased activity in the sharemarket and the rising share index.

New Zealand has an inversely sloped yield curve indicating an expectation that short-term interest rates are likely to fall[11]. This has begun to occur with wholesale interest rates beginning to decline. The flow-on effect is that there should be an increase in the level of investment which will lead to an increase in capital growth and business activity. In the July Business Outlook[12] the general consensus across industries is that recovery is underway. However an overnight recovery cannot be expected and recovery will be slow. Although inflation has fallen, expectations are that inflation will rise slightly over the next quarter. These expectations are expressed by the retail, manufacturing and construction industries which have indicated their intention to raise prices. Retail stock levels have

11 NZIER, [20], p23.

12 National Bank, [21], p3.

increased, suggesting that despite inflationary expectations, business activity is increasing and increased consumption is anticipated.

To fully recover, the New Zealand economy needs sustainable economic growth. This requires technological progress, investment growth, capital growth and efficient resource allocation. The deregulating of the financial markets should have increased the efficiency of resource allocation. The number of financial collapses may indicate an increase in the efficiency of resource allocation. The collapse of an organisation indicates that it has used its resources inefficiently and those resources are now being reallocated. The other factors should come with increased confidence, so in time New Zealand should experience sustainable growth. To start this growth, a large input of capital into growth industries is needed. With the drop in interest rates, the rate of capital investment should increase as it becomes cheaper to borrow the funds required for investment.

The foreign exchange rate has fallen in the last twelve months. The dollar is now at a rate that makes exports competitive on world markets. Previously the exchange rate was at a level that made New Zealand exports uncompetitive on world markets. Many manufacturers have moved their operations out of New Zealand to cheaper labour markets, the high exchange rate making it more profitable to import the products than to manufacture locally. The fall in exchange rate has given rise to an export-led recovery[13].

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13 Westpac Economics Department, [30], p8.

It may be concluded that New Zealand is beginning to stabilise economically and recovery will follow. Unemployment is believed to have peaked[14]. Confidence is reappearing and with lower interest rates capital investment is likely to increase. Although inflation is likely to rise slightly the main present impairment to full economic recovery is a weak consumer demand. Once demand is increased the economy is poised for real growth.

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14 Westpac Economics Department, [30], p7.

CHAPTER III

INDUSTRY ANALYSIS

There is little benefit in selecting the best investment opportunity in the worst performing industry. To do so insures a non-optimal investment decision. Should such an investment have the highest return in such a weak industry, it does not automatically mean it should be undertaken by a rational, profit maximising investor. If the outlook for an industry is bleak, it may be more profitable to invest in a better performing industry. It is therefore necessary to determine the state of the agricultural industry and its prospects in order to assess the desirability of investment in the bull beef industry.

Economic recovery in New Zealand has been led by the agricultural industry[15]. With the fall in the New Zealand dollar, exports have become yet more profitable. Further, while the agricultural upturn was led by the dairy industry other sectors in the industry are following.

The agricultural industry has been severely affected by the government's deregulation policies. Subsidies and incentives were eliminated in accordance with the free market approach. At the end of the 1984-85 season, the Supplementary Minimum Price (SMP) scheme guaranteed farmers a minimum price for their products, and

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15 National Bank of New Zealand Economics Division, [18], p1.

therefore a minimum income. There were also Land Development Encouragement Loans, Livestock Incentive Schemes, fertilizer subsidies, irrigation subsidies and tax concessions[16]. The removal of these subsidies left farmers exposed to the forces of the market place and increased the risks to which farmers were and are exposed.

New Zealand agricultural products are competing on world markets with those of America and the European Community (EC). Many products of the EC and America are heavily subsidised leaving New Zealand products at a competitive disadvantage. The EC currently has large stockpiles of agricultural products which if released onto the market could have a serious downward influence on prices.

While agricultural support was being removed, prices on the world markets were falling, resulting in lower farm incomes. Hence, in order to reduce expenditure, farmers allowed farm maintenance and investment to fall and fertiliser, in particular, was not applied. This will slow the speed of recovery as farms that have not been maintained and fertilized will not be able to produce at full capacity during recovery.

Before 1984 New Zealand was a highly regulated economy in which interest rates were controlled and farmers were reasonably certain with respect to their debt-servicing burdens. In the present deregulated environment, this is no longer the case. In the face of rising interest rates, many farms became unprofitable and farmers

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16 Rayner, [25], pp20-1 and Pryde, [24], p22.

could not meet their interest commitments. At the same time the New Zealand dollar was high relative to the currencies of its major trading partners driving down returns to farmers. Farming was further affected by droughts in some parts of the country while yet other areas were exposed to damaging storms and floods. At this point the outlook for the New Zealand agricultural industry was not optimistic.

In recent months the New Zealand dollar has fallen to a more competitive rate and, with interest rates falling, loan servicing activities are becoming more manageable, although this is still the largest farm expense[17]. In a global perspective, the U.S. experienced a severe drought in 1988 and is slowly recovering. This has limited the supply of some agricultural products on world markets, causing prices to rise. As New Zealand did not suffer a drought at the same time the New Zealand agricultural industry was able to benefit from these rising prices.

The New Zealand agricultural industry is now undergoinging recovery. Due to climatic conditions, much stock has been slaughtered earlier than it otherwise would have been and replacement is only now commencing. Together with a decline in the number of farmers, this has resulted in the prices of farm products rising as the supply is exceeded by demand. At the same time an export-led recovery has been experienced and output has increased. New Zealand is likely to

17 MAFCorp, [10], p64.

further benefit from the focus on agricultural trade in the GATT negotiations.

While the agricultural industry is no longer the mainstay of the New Zealand economy, it is now returning to profitability. New Zealand must still look to expand into other fields in which it has a competitive advantage on world markets. The EC, with subsidised production of primary products, poses a competitive threat to New Zealand on world markets which, under a free market, leaves this country at a competitive disadvantage. With subsidised production, the EC can afford to sell on world markets at a far cheaper price than New Zealand; hence, New Zealand appears uncompetitive. The state of the agricultural industry is highlighted by the fall in the contribution of the agricultural sector to GDP. In the last ten years agriculture's contribution has fallen from 9.96% to 8.26% of GDP[18].

Net farm incomes are expected to rise and this will be used to reduce debt levels. Once debt has been reduced, with the falling interest rates, farm investment is likely to increase. It is at this time that farmers will begin rebuilding stock levels after adverse climatic conditions forced the early slaughter of much stock. It is due to this situation that MAFTech devised this investment project. It encourages farming activity where none may have otherwise eventuated.

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18 Ord O'Conner Grieve, [22], p6.

It can be concluded that the agricultural industry is adjusting to the newly deregulated environment and is learning to become competitive in the face of free market forces. The fall in interest rates has alleviated debt burdens to the extent that farmers can now shift their focus of attention to improving farming production rather than meeting debt servicing requirements. With a more competitive foreign exchange rate New Zealand farmers are in a better position to face international competition.

CHAPTER IV

THE BULL BEEF MARKET

The profitability of this investment scheme is fully dependent on the schedule price of the beef at the time the stock is slaughtered. As this is the sole source of income from the investment it completely governs the rate of return which will be achieved. If the schedule price is insufficient, the costs of production will not be recovered. Although the schedule price is dependent on other items such as foreign exchange, the major determinants are the level of supply and demand in the world beef markets, and in particular, in those countries to which New Zealand exports. For the investment to be profitable there must be sufficient markets in which to sell New Zealand beef at a price which is adequate to provide a competitive return.

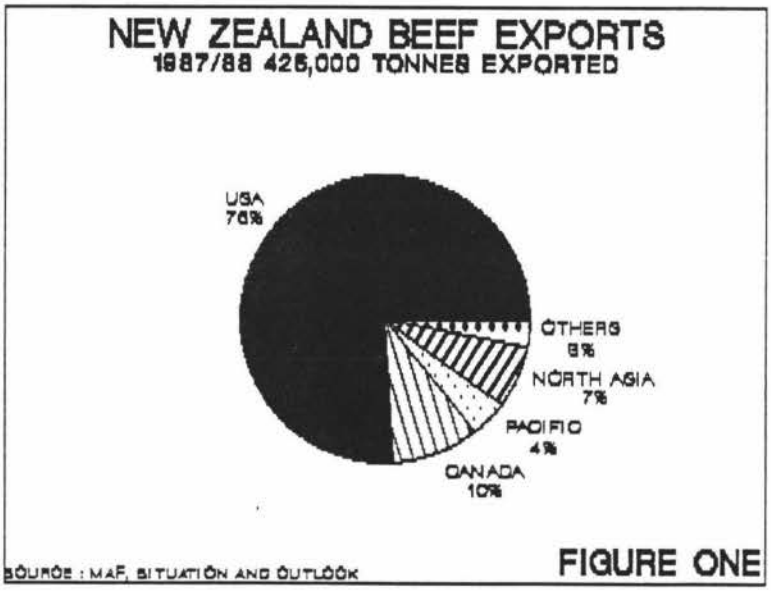
The majority of the analysis and forecasting of the New Zealand beef markets has been done by various divisions of MAF. It would have been preferable to obtain an independent and objective analysis of the market. The investment scheme established by MAFTech would naturally have been founded upon the research conducted by their own organisation. To determine how realistic the industry and market projections are, and therefore how profitable the scheme will be, it would be desirable to have a basis of comparison for the predictions of market trends. While organisations in other countries such as the U.S. and England provide beef market information, it does not consistently contain the same depth of information with

respect to New Zealand and its relationship with world markets, as the information provided by MAF.

THE BEEF MARKET AT PRESENT

NORTH AMERICA

For simplicity, MAF's analysis will be accepted and used as the basis on which conclusions are drawn. As shown in Figure 1 the majority of New Zealand beef exports, (that is approximately 85%), go to North America[19] but represents only 29.5% of U.S. beef imports.



19 MAFCorp, [10], p28.

With the North American market accounting for such a large percentage of New Zealand beef sales the price of New Zealand beef is largely set by the prices in this market. As a result, to determine probable beef prices over the period of investment the conditions existing in the U.S. beef market must be established.

At present the U.S. is slowly rebuilding its beef herd after a drought in 1988. Rebuilding was originally expected to occur sooner but the drought has led to slow expansion of cattle population. The process is further slowed by high interest rates and competition with white meats such as poultry, pork and fish. There is also a dietary change with a move towards a greater consumption of white meats in line with increased health awareness[20].

The 'flow-on' effect of this is that low domestic supplies have caused record retail prices to be achieved so that high prices for slaughter and packing can be passed on to consumers. Beef prices are already well in excess of alternative meat prices such as lamb and there is concern that consumers will substitute these cheaper meats into their diets. However as New Zealand beef is sold to the manufacturing beef market, as opposed to the consumer market, the impact should not be as great as if it were sold to the retail market. The consumer is not faced with a decision between beef and a beef substitute but instead is deciding between hamburgers and other takeaway meals. The full price rise is not expected to be passed on to the consumer. For example, hamburger prices will not rise by the

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20 Wright, [32], p26.

full beef price rise in the short-term because it will only absorb a portion of the total price fluctuation.

The price elasticity of beef has been tested by Simpson and Farris[21] who found that the price elasticity of beef was -0.7%. This means that a 1% increase in the retail price of beef will give rise to a 0.7% decrease in the quantity of beef purchased by consumers. The same is true for a 1% decrease in price which would lead to a 0.7% rise in quantity demanded. This study is especially relevant as it was conducted in the U.S. which is the market of final demand for New Zealand beef.

Again it should be noted that this refers to U.S. retail demand, but New Zealand beef is exported as manufacturing beef. Manufacturing beef is used to make mince and used in a variety of products such as hamburgers. It is therefore more relevant to test the elasticity of either the end products or substitute products. As the final products are numerous it is more feasible to investigate the cross price-elasticity between meat products. Wright[22] found that as beef prices rise lamb and mutton is increasingly substituted. Therefore for every 1% increase in the price of beef, the demand for lamb and mutton rises 0.62%. Veal takes the next largest increase in demand with 0.38% and chicken 0.23%. Turkey and pork both enjoy approximately a 0.10% increase in demand with every 1% in retail beef prices.

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21 Simpson and Farris, [29], p29.

22 Wright, [32], p21.

This elasticity of demand is an important factor in the light of the expected increase in beef prices. As the price rises there will be an increasing demand for other meats. While it is unlikely that pork or chicken will be substituted for processing into hamburgers, lamb and especially mutton can be used. The figures quoted by Wright are based on 1960's data and do not incorporate the change in dietary preferences inspired by the increased consciousness of health. Cholesterol is now a major factor in determining the dietary preferences of many people. It is most likely that the fall in demand due to increased prices can be offset by other factors such as increased income or new markets.

It has been established that beef has a income elasticity of 0.5%[23]. For every 1% increase in real incomes the demand for beef rises by 0.5%; therefore with real disposable income in the U.S. expected to rise by 2 - 2.5% over the next two years the quantity demand can be expected to rise by approximately 1%. This, together with rising employment and expanding Asian markets, suggests that the fall in demand due to price rises will be offset[24]. It is unlikely that New Zealand exports will suffer due to U.S. retail price rises. The offsetting factors should be sufficient to maintain a stable, and possibly growing, demand.

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23 Simpson and Farris, [29], p29.

24 MAFCorp, [10], p29.

NORTH ASIA

In 1988 New Zealand was unable to fill its U.S. quota and had a shortfall in supply of 1000 tonnes. This year U.S. imports of New Zealand beef will be reduced by 4545 tonnes, due to changes in the U.S. quotas. In its investment proposal MAFTech state that this reduction in exports to the U.S. should be covered by increased exports to the North Asian markets, particularly Japan, South Korea and Taiwan. However, in another publication MAFTech state that New Zealand is unlikely to make much of an impression in this market and that instead exports to the U.S. are more likely to increase as Australia and the U.S. increase their exports to North Asia[25].

As MAF appears to be somewhat confused and contradictary internally, the conservative view must be taken and it must be assumed that New Zealand will not achieve a significant share of the new markets emerging in this part of the world. Between 1983 and 1987 New Zealand's share of the Japanese beef market fell from 5.6% to 3.4%[26]. Fraser conducted a survey among beef exporters to Japan in an effort to determine the main obstacles to New Zealand beef exporters. The largest problem appeared to be a complex tender system which few exporters understood. With restrictive quotas many found it difficult to gain access to Japan. Many

25 MAFCorp, [10], p30.

26 Fraser, [7], p16.

Japanese importers were satisfied by the U.S. and Australian producers and would not change merely for the sake of change.

Other encumbrances resulted from political aspects. New Zealand has a smaller diplomatic force with the Japanese than do the Australians and the Americans. In addition, it was found that the Japanese were prepared to manipulate the tender system in order to appease the Americans. To become a force in the Asian markets requires long-term commitment on the part of exporters. This must be demonstrated by establishing permanent representation at a local level.

The benefit for New Zealand exports must be assumed to lie in the share its competitors will gain in Asia, allowing New Zealand to increase the quantity it exports to North America and in particular the United States. An agreement has been made with the EC that it will not unleash its subsidised beef onto the North Asian market. This means the U.S. and Australia will be competitive enough to gain a share of the market.

THE FUTURE

The outlook for the bull beef market appears promising. The climatic conditions, both in New Zealand and the U.S., indicate that the quantity demanded will exceed the quantity supplied thereby causing prices to rise on the world market.

New Zealand's concern is its competitive position on world markets. The majority of sales will still be to the U.S. Although new markets are opening up in North Asia it is unlikely that New Zealand will gain a significant share of the new market. It is hoped that the U.S. or Australia will gain a large share of the new markets, thereby opening up a larger share of the U.S. market to New Zealand. Due to growth in real disposable income and higher employment levels in the U.S. high real prices for imported beef are expected to continue through 1990 and may continue to increase from there[27]. However there are sufficient counteracting forces that will maintain the demand for New Zealand beef for manufacturing.

In time New Zealand may be able to establish a footing in the Asian markets. This is particularly likely in Japan as links with the Japanese improve. Already some beef joint ventures have been undertaken.

New Zealand will not be able to gain access to South East Asian, African or Middle East markets due to the supply of EC subsidised beef and cheap South American beef which already have a stronghold there making New Zealand beef uncompetitive. The EC is likely to continue to produce in excess of demand over the next two years.

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27 MAFCorp, [10], p29.

CHAPTER V

FINANCIAL ANALYSIS

The financial analysis will be undertaken in several areas. The investment will be analysed on a cashflow basis to establish a rate of return. Returns will then be subjected to a sensitivity analysis. The return then needs to be assessed relative to the level of risk involved. Risk will be measured in terms of standard deviations. Finally the investment will be compared to alternative opportunities through the use of an efficient frontier.

RETURN

The analysis undertaken, as laid out in Table 1, differs from that conducted by MAFTech. A replication of MAFTech's analysis is included in Appendix One together with explanatory notes. Firstly the analysis is conducted on the basis that the beasts reach 220kg carcass weight (cw) as opposed to MAFTech's assumption that they reach 230kg cw. This is done because, although MAFTech discusses the revenue split changing from 70:30 to 90:10 at this weight, it is not made clear how they calculate this - in fact they seem to ignore the change in revenue split completely.

The analysis will be based upon the stock being slaughtered at 220kg cw. However it is possible to calculate the revenue once the split changes by adding the extra revenue after the costs have been deducted. This is done in Table Two. It is recognised that not all

the bulls will weigh 220kg cw on slaughter. This also applies to the purchase weight of 80kg liveweight (lw). However it is assumed that the weights will be normally distributed so the beasts weighing less than 220kg are offset by those that weigh more.

The interest rate has been revised downward from 19.5% to 19% based on the rate for rural lending as quoted by ANZ Bank on 8 August 1989. This rate is applicable for the 15 month period over which the investment occurs and represents an explicit cost if the investor borrows the money to enable an investment in this scheme to be undertaken. It appears that this is also the assumption under which MAFTech operates as the interest cost is shown as an explicit cost in their calculations.

In calculating the gross margin, MAFTech does not include valuation, cartage, tag, drench and procurement costs which represent explicit costs that must be borne as part of the farming operation. Therefore they should be included in the costs deducted from revenue when determining the gross margin. The rationale for not doing so is difficult to determine.

TABLE ONE

GROSS MARGIN FOR DAIRY BULL BEEF
STANDARDS USED
- Buy weaners
- Run at 3/ha
- Sold at 18 months at 220kg
- 3% losses

OWNER / OPERATOR RETURNS		
GROSS REVENUE PER 100 BEASTS PURCHASED		
97 @ 220 @ $1.80kg	$38,412	
DIRECT COSTS PER 100 BEAST		
Stock Purchased:		
100 Weaners at $200	20000	
Animal health $5/head	500	
Supplementary Feed	500	
Interest (19%)*	4750	
Works Levies $10.50/head	1019	
Cartage to Works $12.50/head	1213	
Valuation Cartage Tag and Drench	1300	
Procurement Fee	1516	
Total Direct Costs		30797
Gross margin		$7,615

*Base rate of 15.75% plus premium of 3.25% as quoted by ANZ Bank at 9 August 1989

Revenue	$38,412
Less return of Capital	25047
Available for disbusement	$13,365

SHARE OF RETURNS

		OWNER		FARMER
Revenue (30:70)		$4,010		$9,356
Less Costs				
Reporting Fees	100		300	
Animal Health			500	
Supplementary Feed			500	
Total Costs		100		1300
Net Revenue		$3,910		$8,056

Columns may not add due to rounding

TABLE TWO

230kg cw

Share of revenue	Owner	Farmer	Total
Up to 220kg (30:70)	$11,524	$26,888	$38,412
Over 220kg (10:90)	175	1921	2096
Total Revenue	$11,699	$28,809	$40,508

Capital Cost		
Stock	$20,000	
Valuation etc	1300	
Cartage works	1213	
Works Levies	1019	
Procurement Fee	1516	
		25047

Revenue up to 220kg cw	$38,412
Less Capital Cost	25047
Available for disbursement	$13,365

		OWNER		FARMER
Revenue (30:70 split		$4,010		$9,356
Less Cost				
MAF Reporting Fee	100		300	
Animal Health			500	
Supplementary Feed			500	
Total Costs		100		1300
NET REVENUE		3910		8056
Plus Revenue over 220kg		175		1921
Total Revenue		$4,085		$9,977
Rate of Return for 15 months		14.82%		45.86%
Rate of Return per annum		11.86%		36.69%

The capital cost for the proposal is calculated in Table 3 and includes not only the purchase price of the stock, but also the valuation fee, MAFTech's procurement fee, cartage to the farm and tagging the stock. An analogy can be drawn between these expenses and cartage, insurance, valuation and instalment costs when

purchasing plant or equipment for a manufacturing firm. These costs are capitalised under those circumstances and for the purpose of this study the same capitalisation of costs will be applied to bull beef farming. Consequently, cartage to the works, and work's levies, can be viewed as similar to demolition and removal costs when plant is scrapped, and will therefore be capitalised.

TABLE THREE

Capital Cost	
Stock	20000
Valuation etc	1300
Works Cartage	1213
Works Levies	1019
Procurement Fee	1516
	$25,047

As the owner's investment is secured by way of a first charge on revenue, the capital cost must be deducted before the revenue is split. The residue is the revenue available for disbursement. This is the split 70% for the farmer and 30% for the owner. From the revenue attributed to each party their individual operating expenses are deducted. For the owner these consist solely of reporting fees charged by MAFTech for the management reports. The farmer also has animal health and supplementary feed expenses in addition to the reporting fees.

Up to this point the departures from MAFTech's methodology have not been significant and have been primarily based on interpretation. However in the calculation of returns to investor and farmer more significant departures are made. For example, it is not apparent on what costs MAFTech base their calculation of return and furthermore

the return for the farmer is measured in stock units. Hence to make the returns comparable between owner and farmer both will be measured as percentage returns to costs. These returns are calculated in Table Four.

TABLE FOUR

ACTUAL COSTS			
Rent*			$16,500
Labour**	($4.04/hr)		5252
Interest		$4,750	
Capital	Stock	20000	
	Valuation	1300	
	Procurement	1516	
Total Costs		$27,566	$21,752

*Rent cost is based on the market price quoted by Massey University Property Studies Department, April 1989.

**The cost of labour is based on the award wage for an experienced farm worker over 20 years of age working for 20 hours a week for 15 months

Return for 15 months	14.18%	37.03%
Return per annum	11.34%	29.62%

For the owner these costs are the initial capital cost plus the interest expense. For the farmer the actual costs are difficult to ascertain because the farmer is contributing his land, his time and his expertise. Therefore the costs for the farmer are based on market rent prices for agricultural land of the type used for bull beef farming, and the award wage for an experienced farm worker over 20 years of age. It is assumed that the farmer works only half of each week (20 hours) on the scheme. The basis of this assumption has been obtained from the staff of the Massey University Bull Beef Unit who also run a sheep unit and conduct other work in conjunction with

their beef duties. Therefore the farming of the bulls should not account for the farmer's entire workload. On this basis the farmer is earning a return which is more than double that earned by the investor.

An alternative viewpoint is that if the investor is only receiving 30% of the revenue then they should only be bearing 30% of the costs. As the owner's costs are known, it must be assumed that the farmer's costs are sufficient to make the owner's costs 30% of the total costs. Working backwards, as demonstrated in Table 5, the farmer's direct costs are known and the market rental is known, so the remaining costs must be the labour content. On this basis the farmer is receiving nine times the award wage and his return is within one percent of the owner's annualised return.

TABLE FIVE

Farmer's Implicit costs		
Owners Costs (30%)		$27,566
Farmer's Costs (70%)		64321
Total Costs		$91,887
Direct Costs		
Health		$500
Feed		500
Rent @ $400/ha/pa		16500
Total Direct Costs		$17,500
Total Implicit Costs		$64,321
Less Direct Costs		16500
Implicit Labour		$47,821
Hourly wage rate	$36.79	
Return for 15 months		12.52%
Return per annum		10.02%

For this investment to be profitable the schedule price of beef must exceed the breakeven point as calculated in Table Six. To determine the breakeven price, the total costs are divided by the weight of the beasts available for sale. The costs are calculated using market costs for the farmer's input.

TABLE SIX

BREAKEVEN POINT

COSTS		
	STOCK	$20,000
	VALUATION ETC	1300
	CARTAGE	1213
	WORKS LEVIES	1019
	PROCUREMENT FEES	1516
	ANIMAL HEALTH	500
	SUPPLEMENTARY FEED	500
	REPORTING FEES	400
	INTEREST	4750
	LABOUR	5252
	RENT @ $400/ha/pa	16500
	TOTAL COSTS	$52,950
Total costs		$52,950
Weight for sale	97 head at 220kg	21340
Required schedule price		$2.48

SENSITIVITY ANALYSIS

Sensitivity analysis allows the impact of changes in the beef price schedule to be investigated. Sensitivity analysis is defined as

> "analysis of the effect on project profitability of possible changes in sales, costs, and so on" [28].

Applying the concept of sensitivity analysis to the appraisal of bull beef farming the change investigated is the schedule price. It is then possible to determine the extent to which schedule price and weight changes impact upon returns to the farmer and the investor.

Table 7 conducts a sensitivity analysis which shows that for every ten cent change in the export price of beef the owner's return changes by 1.86%. However the same price change results in a 5.49% change in return for the farmer. This illustrates the effects of leverage and suggests that the farmer has a greater degree of operating leverage[29]. The high degree of operating leverage would emanate from the high fixed cost associated with the rent of the land. This cost is borne by the farmer regardless of the number of bulls farmed, the time involved, or the weight at which the stock is slaughtered. By comparison the costs to the investor are functions of these factors. The interest expense is governed by the purchase price of the beasts, the number purchased and the time held on the farm. The purchase price is a result of market influences at the time and

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28 Brealey and Meyers, [2], pG10.

29 Operating leverage is defined as the degree to which earnings are effected by a change in sales.

TABLE SEVEN

SENSITIVITY ANALYSIS

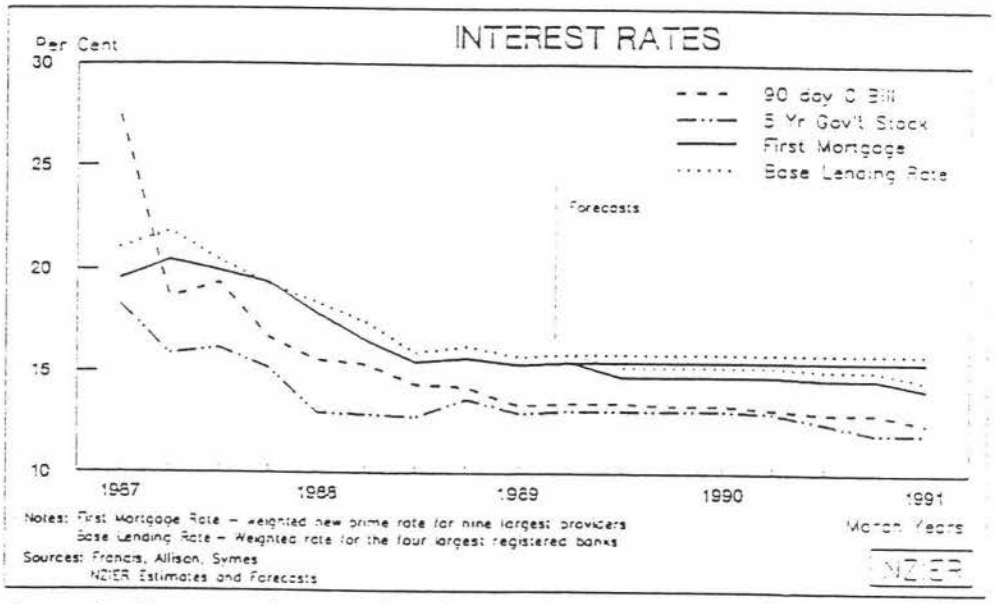
PRICE	RETURN	
	Owner	Farmer
$1.50	5.77%	13.14%
$1.60	7.63%	18.64%
$1.70	9.49%	24.13%
$1.80	11.35%	29.63%
$1.90	13.20%	35.12%
$2.00	15.06%	40.61%
$2.10	16.92%	46.11%
$2.20	18.78%	51.60%
$2.30	20.64%	57.10%
$2.40	22.49%	62.59%
$2.50	24.35%	68.08%
$2.60	26.21%	73.58%
$2.70	28.07%	79.07%
$2.80	29.93%	84.57%
$2.90	31.78%	90.06%
$3.00	33.64%	95.55%
$3.10	35.50%	101.05%
$3.20	37.36%	106.54%
$3.30	39.21%	112.04%
$3.40	41.07%	117.53%
$3.50	42.93%	123.02%

Price change	Percentage change in return	
$.10	1.86%	5.49%

the number of beasts purchased. The other costs are similarly influenced.

An analysis of the sensitivity of returns to interest rates will not be conducted. Although the interest rate can have a significant effect on the return it is not relevant under the present economic conditions. At present the yield curve is downward sloping. (See Figure 2) Over the next five years interest rates are expected to decline. If the reverse were true it would be necessary to investigate the impact of interest rate rises on returns. Over the 15 months of the period of investment the yield curve is virtually flat. Any interest rate movement is expected to be downward indicating that any change would only increase return. The present interest rate structure conforms with a worst case scenario.

Figure Two



The weight of the stock at slaughter time governs how many kilograms are for sale. Therefore the combination of price and weight determines the total return. MAFTech conducted a sensitivity analysis on the combination of price and weight in their original proposal using their method of calculating returns (See Appendix Two). This has been recalculated using the method calculated above. The results are laid out in Table 8 and differ from those calculated by MAFTech. The returns to the owner are lower due to the differing method of calculation. However the most important difference is that the returns to the farmer are calculated as percentages based on the amount invested instead of the dollar return per stock unit used by MAFTech.

As these returns are annualised it is possible to compare the return to that earned on a one year deposit in the Rural Bank. This rate is currently 11.75%[30]. To achieve the same return for the owner the

30 The Dominion, Monday, 27 November, 1989.

TABLE EIGHT
SENSITIVITY OF RETURNS TO PRICES AND WEIGHTS

OWNER

kg\price	$1.70	$1.80	$1.90	$2.00	$2.10	$2.20	$2.30
220	9.49%	11.35%	13.20%	15.06%	16.92%	18.78%	20.64%
230	9.97%	11.85%	13.74%	15.62%	17.51%	19.40%	21.28%
240	10.45%	12.36%	14.27%	16.19%	18.10%	20.02%	21.93%
250	10.92%	12.87%	14.81%	16.75%	18.69%	20.64%	22.58%
260	11.40%	13.37%	15.34%	17.31%	19.28%	21.25%	23.23%
270	11.88%	13.88%	15.88%	17.88%	19.88%	21.87%	23.87%

FARMER

kg\price	$1.70	$1.80	$1.90	$2.00	$2.10	$2.20	$2.30
220	24.13%	29.63%	35.12%	40.61%	46.11%	51.60%	57.10%
230	33.84%	39.90%	45.97%	52.03%	58.10%	64.16%	70.22%
240	39.29%	45.68%	52.07%	58.45%	64.84%	71.22%	77.61%
250	44.75%	51.46%	58.17%	64.87%	71.58%	78.29%	84.99%
260	50.21%	57.24%	64.27%	71.29%	78.32%	85.35%	92.38%
270	55.67%	63.02%	70.37%	77.72%	85.07%	92.41%	99.76%

stock must weigh a minimum of 230kg carcass weight and the schedule price must be at least $1.80. Although this represents the opportunity cost available to the investor it is the explicit cost that should be used as a basis for comparison. The underlying assumption is that the owner has had to borrow $20 000 to invest in the scheme, in which case the investor requires a minimum return equal to the interest cost to breakeven. This explicit interest cost is 19%, as stated previously, which requires the stock to weigh at least 260 kg at a price of $2.10 or weigh 230 kg at a price of $2.20. The current schedule price is $3.07 at 220 kg which provides a return of 34.94%[31]. This is adequate to compensate the investor for bearing the risk involved in this investment. However this price arises from

31 Ibid.

international beef shortages and is unlikely to be as high in 15 months time should an investor take out a contract now.

Foreign exchange rates are an important determinant of New Zealand beef prices. Much of the production is exported so revenues are earned in foreign currencies. As the main market is the U.S. it is the U.S. dollar that is of prime importance. However it is not necessary to conduct a sensitivity analysis of returns to foreign exchange movements because the New Zealand export price reflects foreign exchange rate movements. The foreign exchange rate has been incorporated into the price quoted in New Zealand dollars. Therefore the price sensitivity of returns also incorporates foreign exchange sensitivity.

RISK

Risk can be measured as the difference between the actual return received compared with the return expected. The standard deviation is the statistic used to measure price volatility[32]. The standard deviation measures total risk whereas beta is a measure of diversifiable risk and as such assumes perfect diversification on the part of the investor. In this instance, however, this is an unrealistic assumption to make, and therefore total risk is measured.

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32 Rubenstein, [27], p170.

When conducting the sensitivity analysis operating leverage was discussed as a contributing factor to the differing magnitudes of the change in return for the farmer and the investor. Leverage may be either operating leverage arising from the level of fixed costs or financial leverage arising from the level of debt undertaken. In a 'normal' one-man farming operation all this risk is borne by the single farmer. Under this scheme the risk arising from the use of financial leverage is transferred to the owner. It is the investor, not the farmer, who now faces exposure to interest rate movements.

Unlike other forms of investment this scheme has additional risks not encountered in many investment opportunities. For example, the usual risks of market price changes, interest rate and purchasing power risks are still present but there is also the additional risk that the beef export price will fall to a point where there is insufficient revenue to cover the capital cost. In addition, climatic risk is always present - a factor which is not experienced with financial instruments such as equities. Should a drought occur costs may rise substantially as extra supplementary feed is required; or conversely, the bulls may have to be slaughtered at a lower weight so as to avoid the additional supplementary feed costs.

This risk, like financial risk, is incorporated into the analysis. It is included through price variation. These prices are determined by the forces of demand and supply. Hence, in the event of a drought a shortage of beef will result as stock is slaughtered at a lower weight, thereby reducing the amount of beef in the market place. This will force the price of beef upwards as competitive forces come into

play. The risk of drought is therefore measured through the variation of price as prices rise to reflect the shortage of beef available.

MAFTech's scheme proposes that the bulls be slaughtered at 18 months and that the maximum time on the farm is 18 months. The stock is purchased as three month old weaners so they are farmed for a period of 15 to 18 months. The research conducted by Tuapaka Farm, Massey University's bull beef unit, includes a farming system similar to that proposed by MAFTech, although it does not involve any investment scheme. This system also purchases three month old weaners and farms them for 15 to 20 months. It is stated in Publication No. 1 that the weaners are purchased in November. If they are then farmed for 15 to 18 months (as under the MAFTech system) the stock will be ready for slaughter between late January and early May. Therefore, the volatility of prices in the period January to May that is of concern. Price volatility at other times is irrelevant as the stock will not then be slaughtered.

The prices over the period of interest for both 1988 and 1989 have been converted to returns in Table Nine. Table 10 then shows the volatility of returns over the period together with the mean and standard deviation. As it is usual to analyse investments on a risk/return basis, rather than a price/risk basis, this makes it possible to evaluate the investment in comparison to other opportunities in the market place. It is then possible to plot the results on an efficient frontier.

TABLE NINE

AT 220kg cw

Price	Return Owner	Farmer
$1.52	6.14%	14.24%
$1.54	6.52%	15.34%
$1.60	7.63%	18.64%
$1.62	8.00%	19.74%
$1.64	8.37%	20.84%
$1.74	10.23%	26.33%
$1.80	11.35%	29.63%
$1.98	14.69%	39.52%
$2.08	16.55%	45.01%
$2.13	17.48%	47.76%
$2.19	18.59%	51.05%
$2.23	19.34%	53.25%
$2.26	19.89%	54.90%

TABLE TEN

DATE	RETURN OWNER	FARMER			
25/1/88	8.00%	19.74%			
1/2/88	6.52%	15.34%			
8/2/88	6.52%	15.34%			
15/2/88	8.37%	20.84%			
22/2/88	8.37%	20.84%			
29/2/88	8.37%	20.84%			
7/3/88	8.37%	20.84%			
14/3/88	10.23%	26.33%			
21/3/88	10.23%	26.33%			
28/3/88	10.23%	26.33%			
5/4/88	11.35%	29.63%			
11/4/88	10.23%	26.33%			
18/4/88	8.37%	20.84%			
26/4/88	7.63%	18.64%			
2/5/88	6.14%	14.24%			
30/1/89	18.59%	51.05%			
6/2/89	19.34%	53.25%			
13/2/89	19.34%	53.25%		1988	
20/2/89	19.34%	53.25%			
27/2/89	19.89%	54.90%	STD DEV	1.57%	4.64%
6/3/89	17.48%	47.76%	MEAN	8.60%	21.50%
13/3/89	17.48%	47.76%			
20/3/89	17.48%	47.76%		1989	
27/3/89	17.48%	47.76%			
3/4/89	17.48%	47.76%	STD DEV	1.35%	4.00%
10/4/89	17.48%	47.76%	MEAN	17.78%	48.64%
17/4/89	17.48%	47.76%			
24/4/89	16.55%	45.01%		TOTAL	
1/5/89	16.55%	45.01%	STD DEV	4.89%	14.44%
8/5/89	14.69%	39.52%	MEAN	13.19%	35.07%

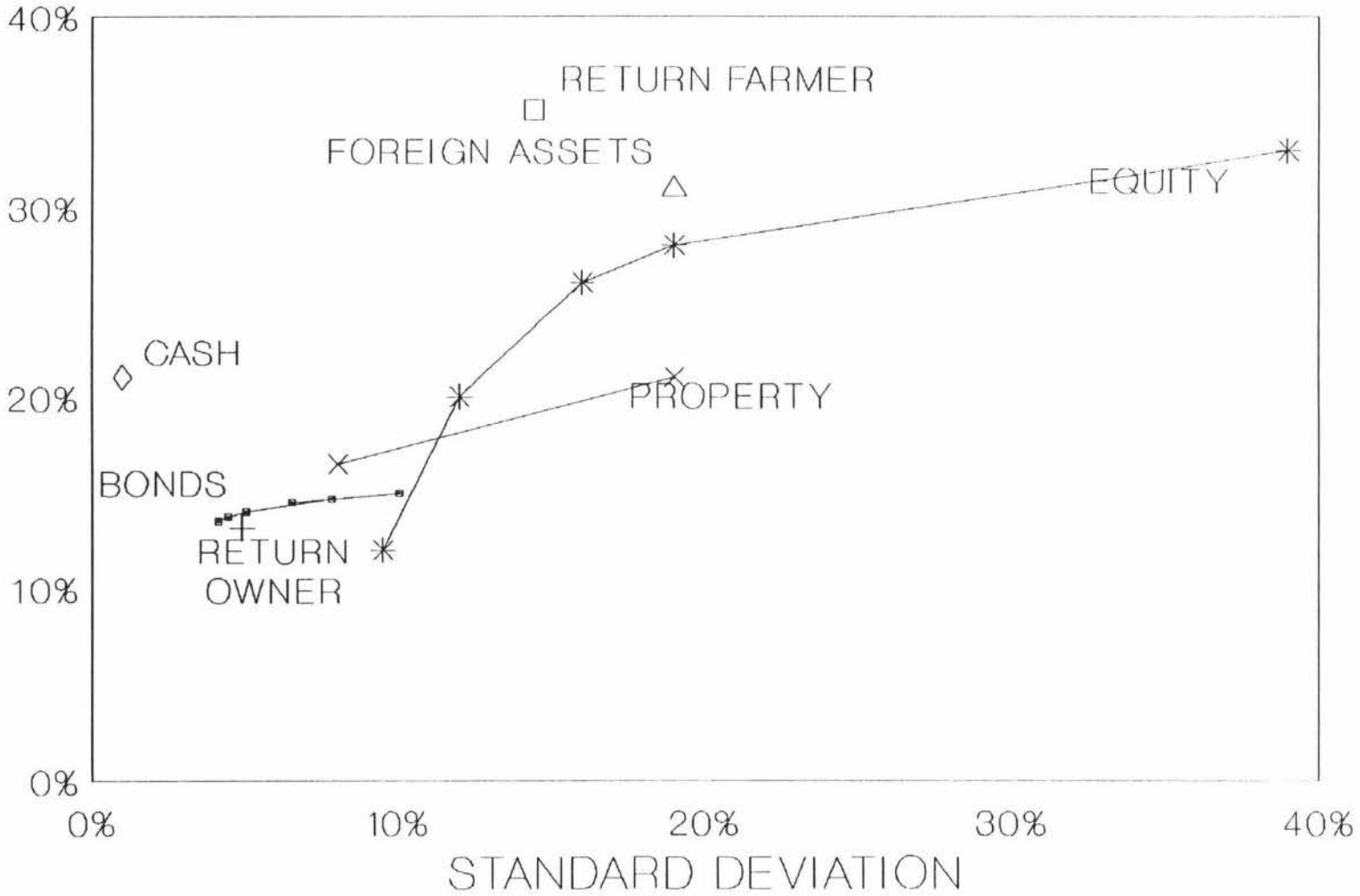
EFFICIENT FRONTIER

An efficient frontier plots combinations of investments on a risk-return basis. An investor can then chose an appropriate risk level which suits their individual preferences and select the investment that offers the maximum return at that level of risk. A rational investor will always seek to maximise return and will therefore only select those investments which generate the highest returns at each risk level.

Plotting the investment on an efficient frontier with conventional financial assets shows that it is an extremely good proposition for the farmer but not so for the owner (See Figure Three). From the owner's perspective a higher return is available at the same risk level by investing in bonds. The farmer is receiving the highest return possible at that risk level - a return that exceeds returns on foreign assets, equities and property. The additional benefit for the farmer lies in not having to make any initial outlay. The data used to derive the efficient frontier are shown in Appendix Three.

EFFICIENT FRONTIER

Figure Three



SOURCE: ORD O'CONNER GRIEVE LTD AND CML

CHAPTER IV

CONCLUSION

The objective of MAFTech in creating this investment scheme is to allow farmers with limited financial capacity to run bull beef without the expense of purchasing stock. Rational investors, making optimal decisions, seek to maximise the return for the level of risk they desire. Although this scheme accomplishes MAFTech's aim, from the investor's perspective the scheme does not represent an efficient investment opportunity.

Under macro-economic analysis the outlook for this investment is healthy because it appears that the New Zealand economy and the agricultural industry are starting to recover now. There are now new opportunities emerging for New Zealand bull beef exports in world markets and New Zealand is poised to take advantage of these due to climatic conditions having reduced the beef population in other countries.

If returns are calculated on the basis of explicit costs then the returns to the farmer, in percentage terms, will prove to be well in excess of those received by the owner. However, as the owner is bearing a greater proportion of the risk this should not be the case. MAFTech does not disclose the implicit rent and labour costs that the farmer incurs and therefore does not compare returns on the same basis. One is measured in terms of dollars per stock unit and

the other return is measured by percentages. They are therefore not easily comparable and it is not immediately evident that the farmer is receiving a superior return. The excess return received by the farmer is further exhibited by the relative positions of the owner and the farmer on the efficient frontier.

By recalculating the returns on the basis of a proportional split of costs, the returns to the farmer have been bought into line with those of the investor - however the implicit wage rate is well above the award rate. In reality the investor is paying the farmer nine times the amount which could be paid to an experienced labourer who is employed to do the same job. It would be more profitable for the investor to rent land at the market rate and employ a labourer at the award rate.

In short, the farmer is receiving an abnormally high return while transferring much of the risk to the owner. The owner earns an inadequate return for the level of risk he incurs. For less risk an investor would be better served by investing in higher returning investments such as government stock.

APPENDIX ONE

MAFTECH ANALYSIS
GROSS MARGIN FOR DAIRY BULL BEEF
STANDARDS USED

Buy weaners
Run at 3/ha
Sold at 18 months at 230kg [1]
3% losses

OWNER/OPERATOR RETURNS
GROSS REVENUE PER 100 BEASTS PURCHASED

97	@	230kg	@	$1.80kg gross[2]		
97	@	220kg	@	$1.80kg	38 412[3]	
97	@	10kg	@	$1.80kg	1 746[3]	
						40 158

DIRECT COSTS PER 100 BEASTS

Stock purchased:		
100 Weaners @ $200.00	20 000	
Animal Health @ $5.00/head	500[4]	
Supplementary feed (Nitrogen)	500[4]	
Cartage @ $7.00/head	700[5]	
Interest	4 875[6]	
Works Levies @ $10.50	1 019[7]	
Cartage to works @ $12.50	1 213[7]	
Total Direct Costs		28 806
Gross Margin		11 352
Gross Margin per hectare		344
Gross Margin per S/U		$25.23[8]

SHAREFARMING RETURNS

Owners share to 220 kg:	30%	Farmers share to 220kg:	70%
over 220 kg:	10%	over 220kg:	90%

Gross Revenue	40 158	
Less Procurement, cartage and levies	3 748[9]	
Less Weaner value	21 300[10]	
Available for disbursement	15 110	
Revenue split	4 402[11]	10 708[11]
Less costs		
Animal health		500
Supplementary feed		500
Total costs	100[12]	1 300[13]
Share of returns	$4 302	$9 408

Investment return 16.2%[14] Return per s/u $20.91[15]

1. The weaners are bought at three months and sold at 18 months so the time on the farm, and therefore the holding period of the

investment is 15 months.

2. Assumes beasts reach 230kg cw and schedule price is $1.80 kg.

3. Revenue is calculated for the first 220kg separately from the last 10kg because up to 220kg the revenue split is 70:30 in favour of the farmer. Over this weight the revenue is split 90:10 in favour of the farmer. Therefore it is necessary to calculate the two elements of revenue separately.

4. These costs are borne by the farmer after the revenue is split. They are the farmer's own costs.

5. This cartage cost is included in the capital cost of purchasing the weaners.

6. Assumes a fixed interest rate of 19.5% on $20 000 for 15 months.

7. These costs are included in the procurement, cartage and levies costs deducted from the gross revenue before it is split.

8. This measure is a standardised measure of stock units where one bull is equal to 4.5 stock units.

9. The cartage and levies portion is shown in the direct costs section.

Works Levies @ $10.50	(6)	$1019
Cartage to works @ $12.50	(6)qq	1213
		2232

The procurement fee is the difference

$3748 - 2232 = $1516

This is MAFTech's fee for acting as agents for the owner in purchasing the stock.

10. Added to the original purchase price are other capital costs.

Stock purchase	$20 000
Valuation fee	400
Cartage (4)	700
Tag and Drench	200
Total Capital Cost	21 300

11. This shows the split of income. This should be a 70:30 split but is in fact a 71:29. 70:30 is equal to $10 577 for the farmer and $4533 for the owner.

12. The owner's total costs include a $100 reporting fee charged by MAFTech.

13. The farmer's total costs include a $300 management and reporting fee charged by MAFTech.

14. This return is over the 15 month period of the investment. As far as it is possible to tell it is calculated as follows.

Capital costs	$21 300
Reporting fee	100
Interest	4 875
Total Owner's Costs	$26 275

Return = \$4 302/\$26 275

= 16. 37%

Annualised this is equal to 13.1% per annum

15. The farmer's return is measured in stock units.

9408/450 = \$20.91 return per stock unit.

APPENDIX TWO

MAFTech

The Leading Edge

BULL BEEF INVESTMENT

MAFTech are now able to offer services to farmers and people interested in farming so that their investment is well managed and monitored throughout the period of investment and that risk is minimised.

The enclosed bull beef investment opportunity offers investors very good returns through access to bull beef export market on a sharefarming basis. It also frees grazing farmers capital for other uses and offers them better returns than for sheep. The aim of the agreement is to provide equitable returns for the owner and the sharefarmer.

The scheme involves units of 50 stock which are sharefarmed for a maximum of 18 months. The profits are split between the owner and sharefarmer. The scheme requires a sharefarmer (approved by MAFTech) to enter a contract with the owner(s) to take a calf of minimum 80kgs liveweight to at least 220kgs carcass weight within this 18 month period.

Contracts

In essence there are three contracts. One contract is between the owner of the stock and the sharefarmer, another contract between MAFTech and the stock owner and the third contract is between MAFTech and the sharefarmer.

The contract between the owner and the sharefarmer covers the objectives of the agreement, schedules the stock involved, sets out the owner's obligations and the sharefarmer's obligations, the weighing procedure and methods of payment. The management contract between MAFTech and the stock owners sets out MAFTech's obligations and the owner's responsibilities. The contract between MAFTech and the sharefarmer sets out MAFTech's obligations in this case and the sharefarmer's responsibilities.

Buying Order

MAFTech consultants are able to operate as owner's agent for the purchase of stock for inclusion in the contract. Consultants will arrange all details regarding delivery and identification of stock to be purchased.

Risk

Sharefarmers are selected on the suitability of property and their ability to perform. Investors risks are spread because stock are placed in lots of 50. Each animal's progress is monitored by MAFTech staff through inspections at least three times during the growing period and reports are submitted to the owner. MAFTech staff provide advice on feeding management and husbandry to the sharefarmer under a management contract.

The original investment (purchase price) by the owner becomes a first charge on the final proceeds ensuring the initial investment is secured. The remaining proceeds are then split 70:30 up to 220kg carcass weight and 90:10 above 220kg in favour of the sharefarmer. Under this formula the owner's investment risk is minimised.

Returns

A conservative MAFTech forecast calculated on beef schedule value of $1.80 per kg for 230kg cwt would give a return on capital of 16.2%. On present day schedules this return would be 23.2%.

At the other end of the scale, the MAFTech projection for a 270kg carcass at a schedule value of $2.30/kg would provide a return of 33.6% on capital. These prices are net of cartage and commission. They are calculated on an annual basis.

Taxation

Stock under this scheme will be treated as trading stock for tax purposes. Whilst a small concessionary tax advantage may exist this year there is no guarantee that this will continue into the future. Returns indicated on the sensitivity tables are before tax.

J.D.Stevenson
Area Manager
Masterton.

MARKET OUTLOOK BULL BEEF

New Zealand Bull Beef production is used almost exclusively to supply the US manufacturing beef market requirements. Bull beef is exported along with cow beef which is also used in the manufacturing type beef consumption in North America. Over 85% of New Zealand beef exports go to North America hence developments in the North American beef market are the principle determinent of New Zealand beef prices.

United States has a voluntary restraint agreement with all countries that export beef to the US domestic market. Quotas are issued upto a trigger level equalling the total requirement for imported beef to the US. Last year the trigger level was set at 1525 million pounds. New Zealand agreed to a voluntary quota of 201,800 tonnes, however this was increased late in 1988 to 204,500 tonnes. New Zealand beef and veal exports for 1988 were not able to fill the full quota issued (1000 tonnes short).

The trigger import level to the US has been reduced from 1525 million pounds to 1438 million pounds a reduction of 87million pounds. However Canada has been excluded from the Meat Import Law and their volume has been excluded from the trigger level set. The net reduction on importing countries is 10 million pounds. With the buoyancy of the Japanese and Korean markets given its present level, the expected impact of the voluntary restraint order on New Zealand exports is not likely to have a major impact this year.

Prices in North America in 1988/89 are expected to strengthen by as much as 5% due to lower supplies of domestic manufacturing type beef. Two major forecasts emanating from the 65th USDA Agricultural Outlook Conference held on the 30th November 1988 were for a slow herd expansion and for record retail beef prices. Uncertainty remains for the coming year as to how consumers will respond to these higher retail beef prices.

It seems certain that prices will top 1988 records as packers and retailers funnel the costs of higher prices for slaughter cattle into the retail marketing chain over the coming year. The higher price of beef relative to competing meats has always been a major concern to the US industry and 1989 may truly test consumer demand for beef products.

Cattle numbers are expected to expand during 1989/90 however this expansion is likely to be slow due to the excess availability of forage and the opportunity to put more weight into growing cattle. It is expected that the United States inventory of beef could remain below 105 million until at least mid 1990. The implication of herd rebuilding combined with higher US domestic beef prices as far as New Zealand is concerned is likely to be higher prices for imported beef items during 1989.

GROSS MARGIN FOR DAIRY BULL BEEF

STANDARDS USED

* Buy Weaners
* Run at 3/ha
* Sold at 18 months at 230kg
* 3% losses

OWNER/OPERATOR RETURNS

GROSS REVENUE PER 100 BEASTS PURCHASED

97	@	230 kg	@	$1.80kg gross		
97	@	220 kg	@	$1.80kg	38,412	
97	@	10 kg	@	$1.80kg	1,746	40,158

DIRECT COSTS PER 100 BEASTS

Stock purchased:			
100 Weaners	@	$200.00	20,000
Animal Health @ $5.00/head			500
Supplementary feed (Nitrogen)			500
Cartage @ $7.00/head			700
Interest on $20,000 @ 19.5% for 15 months			4,875
Works levies	@	$10.50	1,019
Cartage to Works	@	$12.50	1,213
Total Direct Costs			28,806
Gross Margin			11,352
Gross Margin per hectare			**344**
Gross Margin per S/U			**$25.23**

SHAREFARMING RETURNS

Owners share to 220kg 30% Farmer's share to 220kg 70%
over 220kg 10% over 220kg 90%

Gross Revenue	40,158	
Less procurement, cartage & levies	3,748	
Less Weaner value ##	21,300	
Available for disbursement	15,110	
Revenue split 4,402		10,708
Less Costs:		
Animal Health		500
Supplementary feed		500
Total costs 100		1,300
Share of Returns $4,302		$9,408

Investment Return **16.2%** Return per s/u **$20.91**

included in capital cost

Valuation fee	400
Cartage	700
Tag & Drench	200
	1,300

EFFECT OF VARYING SCHEDULE VALUES AND CARCASS WEIGHT

NET RETURNS FOR STOCK OWNER

kg cw	$/kg gross 1.70	1.80	1.90	2.00	2.10	2.20	2.30
220	3,316	3,930	4,545	5,159	5,774	6,388	7,003
230	3,678	4,302	4,925	5,549	6,173	6,797	7,421
240	4,023	4,656	5,289	5,922	6,556	7,189	7,822
250	4,353	4,995	5,638	6,281	6,923	7,566	8,206
260	4,670	5,322	5,974	6,626	7,277	7,929	8,581
270	4,975	5,636	6,298	6,959	7,620	8,281	8,942

PER CENT RETURN/YEAR

kg cw	$/kg gross 1.70	1.80	1.90	2.00	2.10	2.20	2.30
220	12.5%	14.8%	17.1%	19.4%	21.7%	24.0%	26.3%
230	13.8%	16.2%	18.5%	20.8%	23.2%	25.5%	27.9%
240	15.1%	17.5%	19.9%	22.2%	24.6%	27.0%	29.4%
250	16.3%	18.8%	21.2%	23.6%	26.0%	28.4%	30.8%
260	17.5%	20.0%	22.4%	24.9%	27.3%	29.8%	32.2%
270	18.7%	21.2%	23.7%	26.1%	28.6%	31.1%	33.6%

Capital cost of weaners	
Weaner price	$20,000
Valuation fee	$ 400
Cartage to Farm	$ 700
Tag and Drench	$ 200
	$21,300
Base Beef Weight	220kg
Owners base share	30.0%
Time on farm till slaughter	15 months

EFFECT OF VARYING SCHEDULE VALUES AND CARCASS WEIGHT

NET RETURNS FOR SHAREFARMER

kg cw	$/kg gross 1.70	1.80	1.90	2.00	2.10	2.20	2.30
220	6,670	8,104	9,538	10,972	12,406	13,840	15,274
230	7,890	9,406	10,926	12,444	13,962	15,480	16,998
240	9,128	10,730	12,332	13,933	15,535	17,137	16,738
250	10,381	12,067	13,752	15,438	17,123	18,809	20,494
260	11,647	13,417	15,188	16,955	18,724	20,494	22,263
270	12,925	14,778	16,631	18,484	20,337	22,190	24,044

RETURN/STOCK UNIT

kg cw	$/kg gross 1.70	1.80	1.90	2.00	2.10	2.20	2.30
220	14.82	18.01	21.19	24.38	27.57	30.76	33.94
230	17.53	20.91	24.28	27.65	31.03	34.40	37.77
240	20.28	23.84	27.40	30.96	34.52	38.08	41.64
250	23.07	26.82	30.56	34.31	38.05	41.80	45.54
260	25.88	29.81	33.75	37.68	41.61	45.54	49.47
270	28.72	32.84	36.96	41.08	45.19	49.31	53.43

Capital cost of weaners

Weaner price	$20,000
Valuation fee	$ 400
Cartage to Farm	$ 700
Tag and drench	$ 200
	$21,300

Base beef weight 220kg

Sharefarmers base share 70.0%

Time on farm till slaughter 15 months

APPENDIX THREE

EFFICIENT FRONTIERS		
INVESTMENT	RETURN (%)	STD DEV (%)
Equity	.33	.39
	.28	.19
	.26	.16
	.2	.12
	.12	.09
Average	.238	.19
Bonds	.15	.1
	.147	.078
	.145	.065
	.14	.05
	.138	.044
	.135	.041
Average	.1425	.063
Property	.21	.08
	.165	.19
Average	.1875	.135
Combination	.28	.175
	.26	.135
	.18	.055
	.16	.045
Average	.176	.082
Cash	.21	.01
Foreign Assets	.31	.19
Bull Beef		
Owner	.132	.049
Farmer	.351	.144

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