

AN EXPLORATORY INVESTIGATION INTO THE
FARM CREDIT MARKET IN NEW ZEALAND

by

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V O L U M E I

(PARTS ONE, TWO AND THREE)

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INTRODUCTION

An increasing interest in the finance of farming in New Zealand has emerged in recent years. This is a result of three major developments:

- (i) the increasing reliance of the farm sector on external sources of finance. For instance, debt per farm has been increasing at an annual compound rate of 12% between 1963 and 1970¹;
- (ii) the effect of recent economic phenomena, such as falling product prices and a high rate of internal inflation, which have highlighted the question of a farm debt "burden";
- (iii) the increasing sophistication of the New Zealand economy. This has offered the community alternative investment opportunities and has raised the question of availability of finance for farmers to sustain and increase their production.

Government has been especially concerned with the effect of these factors on the efficiency of farming in New Zealand

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¹ Agricultural Production Council (168) p.59.

and in June 1971 announced the setting up of the Committee of Inquiry into Lending to Farmers to report on the whole field of farm finance. To the researcher in his quest for economic efficiency, this concern is equally strong. Yet to both the researcher and the Authorities the lack of basic information on the whole process of the distribution to, and use of loanable funds by the farm sector was most apparent. This thesis is therefore concerned with discussing the workings of the farm credit market in New Zealand, in order to provide a basic source of material for policy makers and to act as a reference for future research workers in this field. This thesis attempts to discuss the role and behaviour of leading market actors and some market procedures utilised by them. It also attempts to highlight the problems and difficulties that arise in the course of the market's operations. Primarily however, this thesis is concerned with assessing how well the market works, by identifying the factors that are inhibiting its efficiency.

It was originally proposed to utilise econometric techniques as the investigating tool. The econometric approach has been adopted in a number of farm credit market studies overseas, such as those of Hesser⁽¹⁸⁷⁾ in the United States, and Jarrett and Dillon⁽¹¹³⁾ in Australia. In the event it was decided to forego this approach and utilise a survey approach because:

- (i) the standard of secondary published and unpublished farm credit data has in the past been poor in New Zealand, compared with longer periods of more consistent data available overseas;
- (ii) very little has been written on the farm credit market in New Zealand. There was therefore no descriptive framework available, or firm bases on which to select critical parameters;
- (iii) a descriptive approach to the market, by generating such data, would both facilitate future research, and be of more immediate practical use than an econometric study, given (i) and (ii) above.

The thesis has therefore been written in prose style, with a minimum of mathematical exposition. The approach adopted has limitations, as conclusions are largely qualitative rather than quantitative. It is also a less precise approach as it inevitably incorporates economic, behavioural and sociological factors in explanation of market phenomena. On the other hand, it is concerned in detail with behaviour of the market's participants and is likely to be closer to reality than an

econometric approach. The study also identifies relationships that could be quantified in future research.

The study is presented in four parts. These are largely self contained, with a summary of conclusions at the end of each part. Through use of the funds flow accounting technique, Part One summarises the patterns of cash inflow to and outflow from the farm sector between the 1945/6 and 1968/9 farming years. Data deficiencies are discussed, and the introduction of inbuilt correlations precludes other than descriptive analysis.

Part Two is based primarily on the results of the Lincoln College Credit Survey carried out in December 1970, and describes the operations of the market from the demand viewpoint. Two major phenomena are investigated and the study attempts:

- (i) to determine the extent of a farm sector credit gap. This is defined simply as an unsatisfied economic demand for funds by farmers;
- (ii) to determine the extent of debt aversion in the farm sector.

These phenomena are investigated through a detailed discussion of factors affecting uses of and reasons for uses

of external funds and the reasons for choice of financial institution.

The loose analytical framework is that of the "farm firm", and this is discussed in theory in Chapter Two. This chapter discusses the "firm" concept and implicitly develops a life cycle thesis. The hypothesis formulated is that the changing goal structure of farm operators in the life cycle helps to account for the above phenomena.

Part Three investigates factors influencing the supply and distribution of funds to the farm sector from three selected institutional sources. The interview technique is utilised and the theoretical framework is that of the "market". This concept is discussed in Chapter Ten. Perfect market features are described, and adapted to the New Zealand institutional environment. The actual performance of institutions is examined in relation to these features, and the implicit hypotheses formulated that distribution of funds will be inefficient if there is:

- (i) deviation from perfect market features;
- (ii) an imperfect institutional environment in New Zealand.

Some conclusions are made in Chapter Fourteen but these are only broad as each chapter in Part Three stands as a

self contained unit. In Chapter Fourteen the comment is reiterated that this study is limited to assessing the efficiency of distribution of funds to the farm sector. This thesis does not collect data to or purport to assess the economic efficiency of macro-inter-sector resource allocation.

Four concepts that emerged as important in field investigation are examined further in Part Four. Discussion is presented on the implications of the farm firm life cycle, developed and tested in Part Two; on some problems of resource allocation in the imperfect market; and on the farm ownership and the interest rate concepts. An introduction is made to these topics and their importance defined, in Chapter Fifteen. Part Four concludes with Chapter Twenty. This chapter briefly outlines likely developments in the Farm Credit Market in New Zealand, and also makes a number of suggestions for future research in this field.

The layout of the study is based on intra-chapter sections. This is to facilitate rapid cross reference. Reference to the work of other authors is made through use of indices. For example, Hesser⁽¹⁰⁰⁾ refers to reference number 100 listed in the bibliography. An index without parentheses generally refers to a chapter footnote.

PART ONECHAPTER ONEThe Funds Flow Approach1.1 The Technique

The funds flow approach to market investigation is essentially descriptive rather than analytical. It has been described by Duesenberry⁽²⁰⁾ as,

"..... tracing in a systematic way, the connections between production, prices, expenditure and other variables in a real system and the terms and conditions on which funds can be raised in financial markets..... The flow of funds accounts are an ex-post record of the process by which supplies of and demands for various financial assets are balanced....."

The approach is therefore a means of summarising the financial flows and movements in the New Zealand farm sector from year to year. It has a number of important qualities in that it:-

- (i) is a comprehensive approach linking aggregate financial with aggregate real data;
- (ii) puts into perspective the relative importance of revenue and retained earnings as a source of sectoral funds (1.4.1 and 1.4.4);
- (iii) offers an explanation of changes over time, and shows transactions based on current market values.

In this way it supplements the distorting effect of inflation on income statements.

On the other hand the aggregate summary nature of the funds flow accounts precludes detailed analysis. In this study farm sub-sector or seasonal funds flows are not identified. Such identification would involve additional data and definition problems as encountered in a sectoral quarterly type approach to a United States project. (Anon⁽⁵⁴⁾).

A number of other studies have been carried out in the farm sector using the aggregate approach. The pioneer study was completed by Copeland^(14 p130). The major practical problems experienced by him were those of a rigid definition of the farm sector, and the difficulty of excluding intra-sector transactions that were superimposed on to an inter-sector transaction system. Copeland also found data availability a critical problem and was forced to improvise on the figures available. Subsequent studies by Brake⁽¹⁷³⁾ on Canadian data and Penson, Lins and Irwin⁽¹⁴⁷⁾ on American data have both faced this problem. These studies were carried out after the study on New Zealand data had been completed.

1.2 Definitions

(i) Funds Definition

The approach is based on a "balanced" type of funds statement. This method is based on the equality of total funds inflows to and outflows from the farm sector. This is the "total assets"¹ approach and funds are defined as the entire purchasing power of the farm sector. In this way changes in sources and uses of all funds are highlighted. Under the usual accounting definition of funds (particularly cash or net working capital in the micro-context) the effect of resource changes on "funds" position is highlighted. Anton⁽³⁾ lists two major theoretical problems in use of the "total assets" concept:-

- (a) The definition of funds is imprecise. Whilst some measure of "value" is implied this is never specifically identified.
- (b) Instead of a change in the pool of "funds" as under the traditional definition, the approach emphasises the net change in every resource.

¹ See Anton⁽³⁾ p. 89, for more detailed theoretical discussion.

On the other hand the "total assets" concept is more fluid, and was decided upon after inspection of the limited data available.

(ii) Farm Sector Definition

Johnson's⁽¹¹⁴⁾ definition of the farm sector has been followed. It includes:-

"..... all farms in New Zealand which contribute to national production and excluding organisations providing services to agriculture, such as contractors, aerial topdressers, etc."

As it would be difficult to distinguish between household and business activities, both the farm business and farm household sectors have been combined to represent one transacting body. A micro-study by Mueller⁽¹³⁷⁾ adopted this approach.

1.3 Practical Problems

A funds flow analysis of the New Zealand farm sector is presented in Table 1.1. A number of practical problems were encountered and these are discussed.

(a) Data

Data omissions and data deficiencies have been major problems. Many funds items have been completely omitted. The analysis excludes allowance

TABLE 1.1

NEW ZEALAND FARM SECTOR - FUNDS FLOW STATEMENT 1945/6 - 1968/9

	\$ Million									
	Farming Year ending 30 June									
	1946	1947	1948	1949	1950	1951	1952	1953		
Gross Farm Income	192.2	222.6	271.4	293.4	366.2	582.6	436.5	522.2		
Less Adjustment for livestock inventory changes	- 0.6	- 2.2	4.7	3.0	12.4	36.0	6.7	25.0		
Intra-sector sales	9.4	9.8	9.7	11.3	11.6	12.5	11.4	11.9		
Sector consumption of farm products	3.4	3.9	4.8	5.1	6.4	10.2	7.6	9.1		
Farm Cash Receipts	180.0	211.1	252.2	274.0	335.8	523.9	410.8	476.2		
Less Farm cash expenses	109.5	105.1	126.2	133.2	164.5	241.4	188.3	248.3		
Net cash from farm operations	70.5	106.0	126.0	140.8	171.3	282.5	222.5	227.9		
Off farm income	3.5	4.6	5.5	6.1	6.3	7.0	6.8	8.1		
Farm sector income	74.0	110.6	131.5	146.9	177.6	289.5	229.3	236.0		
Less Tax Paid	4.0	6.1	9.1	13.0	16.5	24.1	51.2	32.7		
Farm sector income after tax	70.0	104.5	122.4	133.9	161.1	265.4	178.1	203.3		
Govt. Grants, Subsidies etc.	1.2	1.4	1.3	0.8	1.4	2.1	3.2	2.5		
Wool Retention Money								12.0		
Net Cash Farm Income	71.2	105.9	123.7	134.7	162.5	267.5	186.3	217.8		
Less Cash Withdrawn	12.4	46.0	55.6	59.5	73.3	88.7	104.0	77.3		
Funds from non-borrowing sources	58.8	59.9	68.1	75.2	89.2	178.8	82.3	140.5		
Gross mortgage borrowing	19.4	26.5	26.7	27.5	26.9	33.8	53.3	58.1		
Net short term borrowing	5.1	7.6				16.8	2.9			
Funds from borrowing sources	24.5	34.1	26.7	27.5	26.9	50.6	56.2	58.1		
Funds from sector balances							31.4			
TOTAL SOURCES OF FUNDS	83.3	94.0	94.8	102.7	116.1	229.4	169.9	198.6		
USES										
Purchases of Plant and Machinery	5.3	6.9	8.5	10.6	14.5	17.5	24.3	25.7		
Construction of Buildings	3.1	4.6	6.4	8.0	10.0	11.7	13.7	15.1		
Purchase of Land	25.9	35.5	30.8	27.2	26.1	35.6	71.9	70.5		
Improvements and Developments	6.2	6.8	8.2	11.3	13.3	15.8	18.3	22.3		
Purchase of farm assets	40.5	53.8	53.9	57.1	63.9	80.6	128.2	133.6		
Mortgage repayments	29.2	25.6	25.8	27.5	28.1	29.5	32.3	33.7		
Net short term repayments			5.2	4.2	6.1			4.7		
Repayments of money borrowed	29.2	25.6	31.0	31.7	34.2	29.5	32.3	38.4		
Death duty and Gift Duty payments	6.3	6.7	6.8	6.9	7.3	8.5	9.4	10.0		
Wool retention money										
Funds to sector balances	7.3	7.9	3.1	7.0	10.7	44.8		16.6		
TOTAL USES OF FUNDS.	83.3	94.0	94.8	102.7	116.1	229.4	169.9	198.6		

	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969
554.6	562.1	554.4	614.0	592.7	564.2	623.5	613.5	613.9	654.0	763.6	792.1	850.5	824.6	826.1	885.6	
23.8	12.4	4.5	9.5	21.9	17.2	2.6	21.5	9.8	0.6	9.1	24.8	53.9	45.7	28.2	12.8	
16.2	16.0	16.1	14.9	14.9	15.9	19.6	21.2	21.1	21.7	25.0	24.4	25.6	29.3	31.5	37.1	
9.5	9.8	9.7	10.7	10.4	9.9	10.9	10.7	10.4	11.4	13.4	13.9	14.9	14.4	14.5	15.5	
495.1	523.9	524.1	578.9	545.5	521.2	590.4	560.1	553.6	620.3	716.1	729.0	756.1	735.2	751.9	820.2	
240.3	244.8	237.0	260.8	227.3	233.6	258.1	229.2	244.7	278.2	329.8	349.5	393.0	373.0	368.4	424.0	
254.8	279.1	287.1	318.1	318.2	287.6	332.3	330.9	308.9	342.1	386.3	379.5	363.1	362.2	383.5	396.0	
8.9	10.0	10.8	12.3	13.4	13.2	14.4	15.8	15.4	15.5	16.9	18.7	19.5	19.8	20.0*	20.0	
263.7	289.1	297.9	330.4	331.6	300.8	346.7	346.7	324.3	357.6	403.2	398.2	382.6	382.0	403.5	416.2	
37.0	43.3	40.0	35.6	37.2	42.4	41.8	54.5	50.3	45.1	44.5	52.5	55.1	56.9	49.8	50.0	
226.7	245.8	257.9	294.8	294.4	258.4	304.9	292.2	274.0	312.5	358.7	345.7	327.5	325.1	353.7	366.2	
2.3	2.3	2.2	1.7	1.8	1.5	1.7	1.1	1.1	1.8	1.6	2.1	3.2	4.0	3.6	4.8	
11.0	11.0	13.0	12.0									4.0	4.0			
240.0	259.1	273.1	303.5	296.2	259.9	306.6	293.3	275.1	314.3	360.3	347.8	334.7	333.1	357.3	371.0	
124.5	112.7	124.3	146.3	158.2	113.0	120.3	132.4	88.1	125.1	162.5	161.7	104.6	96.0	108.3	109.7	
115.5	146.4	148.8	162.2	138.0	146.9	186.3	160.9	187.0	189.2	197.8	186.1	230.1	237.1	249.0	261.3	
54.5	64.8	66.5	67.9	74.2	74.3	77.7	113.6	106.1	107.0	128.7	167.1	181.4	177.3	151.3	157.5	
30.2	6.2			21.3	4.0		20.9	0.7		2.2	26.7	9.3	5.3	4.7	9.3	
84.7	71.0	66.5	67.9	95.5	78.3	77.7	134.5	106.8	107.0	130.9	193.8	190.7	182.6	156.0	166.8	
		0.7		8.6	0.5		5.5	7.9				7.2	16.7			
200.2	217.4	216.0	230.1	242.1	225.7	264.0	300.9	301.7	296.2	318.7	379.9	428.0	436.4	405.0	428.1	
24.2	16.1	26.1	21.7	24.2	21.7	18.6	23.1	25.6	24.3	26.6	26.5	35.8	34.8	28.6	28.0	
16.6	19.8	21.7	22.3	24.0	23.6	23.1	25.7	26.9	29.9	27.6	29.5	35.3	40.1	31.1	31.9	
77.8	96.0	80.5	78.1	100.1	84.8	95.7	135.8	126.7	99.1	120.8	173.9	197.5	185.3	151.1	161.0	
22.7	27.0	31.2	27.5	29.9	29.0	28.8	33.2	34.3	32.1	34.4	39.7	40.0	41.5	40.4	41.1	
141.3	168.9	159.5	149.6	178.2	159.1	166.2	217.8	213.5	185.4	209.4	275.6	308.6	301.7	251.2	262.0	
35.5	36.8	41.4	51.5	55.2	56.0	62.8	70.3	76.4	80.5	78.6	88.8	108.7	124.5	138.0	146.4	
		5.9	10.0			0.6			5.7							
35.5	36.8	47.3	61.5	55.2	56.0	63.4	70.3	76.4	86.2	78.6	88.8	108.7	124.5	138.0	146.4	
10.5	10.4	9.2	8.2	8.7	10.6	12.3	12.8	11.8	10.8	9.4	10.4	10.7	10.2	10.0	11.2	
12.9	1.3		10.8			22.1			13.8	13.3	3.1			5.8	8.5	
10.2	217.4	216.0	230.1	242.1	225.7	264.0	300.9	301.7	296.2	318.7	379.9	428.0	436.4	405.0	428.1	

Key: * estimate.

for cash gifts and unsecured loans injected into the sector. Invested proceeds arising from the sale of farm land to the non-farm sector have been excluded. In the United Kingdom this source of funds is extremely important and it has been estimated in a county study that some two thirds of the proceeds of sale of partial farm land have been reinvested in agriculture.² The figures presented are therefore not fully comprehensive, and only give a good indication of the magnitude and extent of monetary and real transactions within the farm sector.

Data deficiency was a second acute problem. Particularly before 1958, many crude estimates have been made. Some deficiencies had been recognised by the Authorities, and in 1956 a Royal Commission⁽¹⁷⁰⁾ made recommendations for improvements in agricultural statistics. Specifically mentioned in their Report was the need for information on farm mortgage indebtedness, capital expenditure (past and proposed), farm costs and deposits with stock and station agents. In 1964, Recommendation number 17 of the Finance Working Party of the Agriculture Development Conference⁽¹⁶⁷⁾ made the comment that:-

"..... Statistics on farm development costs, capital requirements and productivity on capital are still inadequate as a guide to farm development policy. It is recommended that these statistics be greatly extended and intensified....."

² Unpub. study by R.C. Hine, University of Nottingham (1969).

As a result of these two recommendations there were increases in statistical output, coverage and quality, from 1958 and again from 1965. It is therefore likely that entries in Table 1.1 increase in accuracy whilst reading from left to right.

A detailed description of the sources of data and methods of estimation has been presented in Appendix A. Some of these methods have introduced inbuilt correlation with the final data.

(b) Gross and Net Estimation

Theoretically the funds flow statement indicates net rather than gross sector flows. A major problem of this adherence to accepted routine is that netting can often result in the omission of important financial transactions. In Table 1.1 a departure has been made from strict accounting practice to represent "Gross Mortgage Borrowing" and "Mortgage Repayments" as gross flows. This has been done to facilitate direct comparison with the item "Purchase of Land". It is inconsistent with the rest of the net concepts utilised.

(c) Treatment of Depreciation

Moonitz⁽¹³⁵⁾ and Mason⁽¹⁷⁸⁾ both argue that depreciation does not constitute a source of funds as such. The allowance for depreciation should be as an adjustment to net income in determining the net funds

generated from operations. Depreciation adjustment has therefore been carried out on the worksheet rather than on the formal statement, Table 1.1. The theoretical problems of depreciation measurement have not been considered and the published figures⁽¹⁰⁸⁾ have been taken as given.

(d) Data Adjustment

The accounting year ending 30 June was selected as the unit period. Whilst some data is available on this basis, other material (particularly Government statistics), is published on a March year basis. Such data has been interpolated on a linear basis to produce June figures.

(e) Wool Retention Money

This item has been treated as a separate source/use of funds, and direct adjustment to Gross Income figures has not been made. Income compulsorily or voluntarily retained by Government is treated as a use of funds. Conversely income released is treated as a source of funds.

(f) Cash Withdrawn

This item has not been estimated independently and is a residual balance. Other authors⁽¹⁴⁷⁾ have followed a similar procedure.

(g) Comparison with Other Series

A number of other farm sector funds flow estimates are available in New Zealand; for instance the Government Statistician sample estimates of Dairy Farmer, Town Milk Supplier and Sheep Farmer incomes, and the Meat and Wool Boards Economic Service Survey of Sheep Farmers' incomes. Attempts were made to reconcile these time series data with that of Table 1.1., but proved singularly unsuccessful as:-

- (i) the sample time series have conceptually different aims to the aggregate flow series i.e. the determination of income rather than the determination of true funds flow;
- (ii) sample data is partial rather than aggregate in nature.

Results of the attempted reconciliations have not been presented.

1.4 Funds Flow Analysis³

A few observations on Table 1.1 data are pertinent as a background to subsequent study.

³ All analysis has been carried out on 1945-68 data. 1969 data has been subsequently added as it became available.

(1) The Relationship Between Farm Investment and NetCash Farm Income

Ross⁽¹⁵¹⁾, Keen⁽¹¹⁷⁾ and Philpott and Stewart⁽¹⁴⁸⁾ have all observed the close relationship between investment and income in New Zealand agriculture. The simple zero order correlation coefficients between the item "net cash farm income" in Table 1.1 and farm investment items are presented below (Table 1.2). An analysis of variance technique was used to test the significance of the coefficients. The F-ratio was used as a test statistic.⁴

TABLE 1.2

Relationship Between Net Cash Farm
Income and Agricultural Investment
 (1945-68)

<u>Multiple</u> <u>Relationship</u>	<u>Correlation</u> <u>Coefficient</u>	<u>Significance</u>
N.C.F.I./Agricultural Investment	.863	1%
<u>Partial</u> <u>Relationships</u>		
N.C.F.I./Purchase of Plant & Machinery	.778	Not significant
N.C.F.I./Construction of Buildings	.906	1%
N.C.F.I./Purchase of Land	.827	5%
N.C.F.I./Improvements and Developments	.897	1%

⁴ Where $F = N_1 s_1^2 / n_1 / N_2 s_2^2 / n_2$ in general.

These results are at variance with Ross's⁽¹⁵¹⁾ conclusion that gross investment in machinery is closely related to real net farm income. The other correlation coefficients are highly significant, with the exception of land purchase. In this case other factors such as the availability of external funds and farmer confidence will be important. The close relationship of investment with income does suggest at the outset the possibility of debt aversion as a feature of New Zealand agriculture.

(2) The Relationship Between Change in Net Cash Farm Income and Change in Short-Term Borrowing

The Reserve Bank⁽⁴³⁾ and Monetary and Economic Council⁽¹⁶⁹⁾ both argue that a change in farmers' disposable income will be inversely correlated with a change in short term borrowing. The correlation coefficient from Table 1.1 data was .295. This coefficient ignores any allowance for time lag effects. From observation, data showed that an increase in disposable income was generally associated with an increase in short-term debt. The hypothesis is that an increase in disposable income will lead to a more favourable investment climate and state of expectations and be likely to stimulate short term debt. Stanbridge⁽¹⁷²⁾ has noticed a similar phenomenon in studying United Kingdom data.

(3) Cash Withdrawn

The residual nature of cash withdrawn in this analysis has been noted. Keen⁽¹¹⁸⁾ argues that farm drawings are likely to be stable as

"..... once a farmer has succeeded in establishing a certain standard of living for himself and his family, he is reluctant to see it fluctuate from year to year....."

Baker⁽¹⁷²⁾ makes similar observations on United States data. This analysis suggests that there may be somewhat more annual fluctuation in aggregate than these authors suggest.

From Table 1.1, the average percentage of cash withdrawn to net cash farm income was 40.4%, with a range from 23.0% to 57.8% at the 95% confidence limit. Some relationships between these variables were examined. (Table 1.3). Equations were based on the following hypotheses:-

- (i) Equation 1; that drawings are related directly to net cash farm income.
- (ii) Equation 2; as in (i) above, but with a time lag of one year.
- (iii) Equation 3; that a decrease in disposable income is met with an immediate change in drawings, but that changes in drawings as a result of an increase in disposable income are lagged by one year. The hypothesis was

designed to reflect possible inherent cautiousness on the part of the farm sector.

- (iv) Equation 4; that a change in disposable income is met with a concurrent change in drawings.

Whilst the regression coefficients were in all cases significant, the correlation coefficient and explanatory power of the equations was not high. In view of the stated data deficiencies the results were considered reasonable, and in particular the relationship denoted by Equation 1.

The conclusion is that there is an aggregate relationship between drawings and net cash farm income.

(4) Long Term Trends

(a) Drawings

An attempt was made to determine the real trend of calculated net cash farm income and the residual cash withdrawals items from Table 1.1. As a deflator, a "farmers" cost of living index was utilised, (Table 1.4), based on a 1955 calendar year base of 1,000. The annual index was calculated on a June 30 basis as a simple average of quarterly retail price indices. These indices were adjusted to remove what were considered to be expenditure

TABLE 1.3

Some Relationships Between Cash Withdrawn (D)
and Net Cash Farm Income (Y_D) in \$ Million

Equation No.	Dependent Variable	Independent Variable	Equation	Significance (Regression Coefficient)	Significance (F-test)	R ²	R(12)
1	D _t	Y _{Dt}	D _t = .353Y _{Dt} + 16.318	1%	1%	.632	.796
2	D _t	Y _{Dt-1}	D _t = .319Y _{Dt-1} + 29.447	1%	1%	.604	.777
3	D _t	Y _{DtM}	D _t = .333Y _{DtM} + 28.839	1%	1%	.617	.785
4	Δ ^D	Δ ^Y _D	Δ ^D = .483Δ ^Y _D + 3.467	5%	5%	.182	.427

Key: Y_{DtM} = Net cash farm income (modified) - see text.

items not directly relevant to the farm sector; these were, meat, poultry and fish, rent, home ownership, public transport and private transport.⁵ Correction was made to the data to account for the readjustments in index base and weighting in 1949, 1955 and 1965.

TABLE 1.4

Farmers Price Index (1955 Calendar Year = 1,000)

<u>Y/E 30 June</u>	<u>Index</u>	<u>Y/E 30 June</u>	<u>Index</u>	<u>Y/E 30 June</u>	<u>Index</u>
1950	760	1956	1,012	1962	1,145
1951	829	1957	1,045	1963	1,160
1952	916	1958	1,055	1964	1,175
1953	947	1959	1,105	1965	1,217
1954	981	1960	1,112	1966	1,246
1955	999	1961	1,121	1967	1,291
				1968	1,368

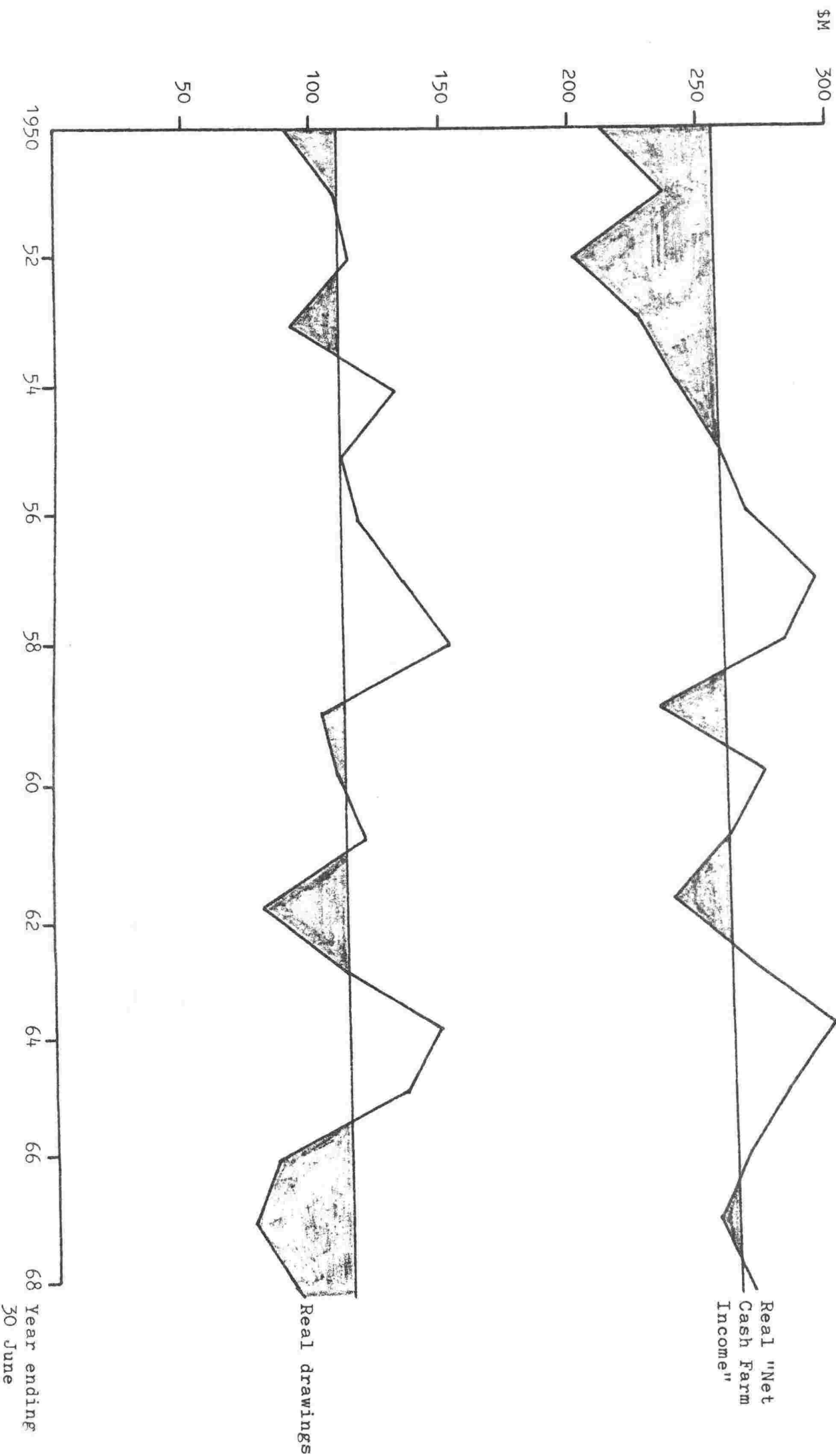
Figure 1.1 represents the results of this analysis. It shows on these crude figures that:-

- (i) real net cash farm income has not shown any upward trend over the period.
- (ii) real sector drawings have shown a decline from their 1955 levels in recent years.

⁵ The merit of such sweeping exclusions has been argued through the letter columns of the New Zealand Listener. April and May, 1971.

Figure 1.1

Real "Net Cash Farm Income" and "Cash Withdrawn"



(b) The Debt/Equity Ratio

The funds flow data was used to examine the relationship between farm sector investment and external borrowing. The annual sector financial leverage ratio (defined as the ratio of own⁶ to borrowed funds) was calculated for each year and plotted against time (Fig. 1.2). Thus for the farming year ending 30 June 1946, the farm sector was able to provide \$2.40 from its own funds for the purchase of land and for other listed uses for every dollar borrowed.

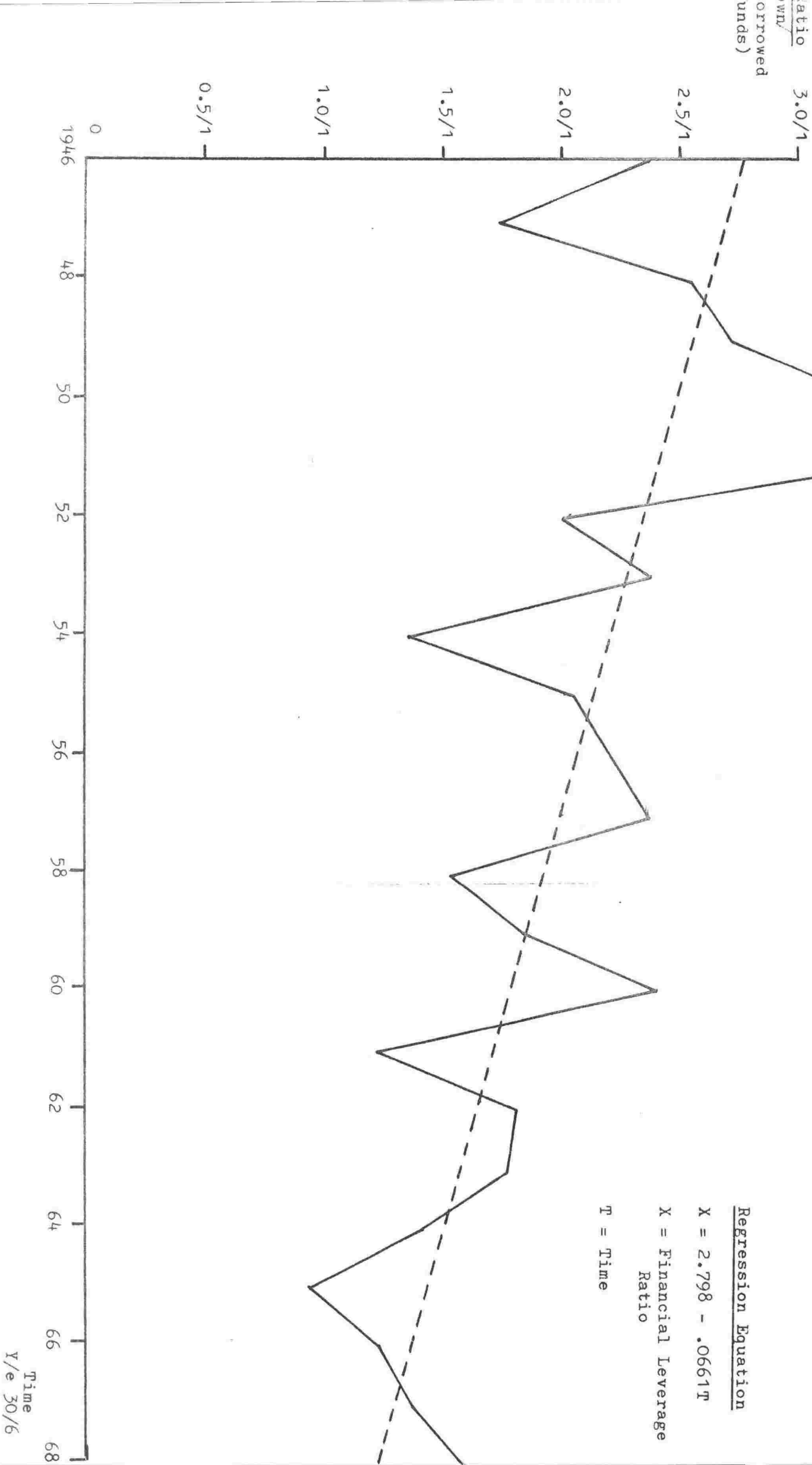
A regression equation was calculated between this ratio (X) and time (T). The relationship had the properties:-

- (i) $X = 2.798 - .066T$;
- (ii) Regression coefficients significant at 1% level;
- (iii) $R^2 (XT) = .4639$ $R(XT) = - .6811$;
- (iv) $d = 1.6858$ since $d > d_u$, we need not reject the hypothesis of random disturbance.

⁶ "Own funds" includes "Net cash farm income" and "funds from sector balances".

Fig. 1.2

New Zealand Agricultural Sector - Financial Leverage Ratio
(1945/6 - 1967/8)



Whilst this equation is not an ex-ante estimator it does summarise the increasing role of external finance in the farm sector, and the relative decline of retained earnings as a source of funds. With this decline the implication is that financial decision will become an increasingly important aspect of the farm business.

The funds flow analysis apart from representing a summary of available information, confirms the close relationship between agricultural income and investment. The relative stagnation of real farm net cash incomes and the increasing role of credit in the farm business have been observed.

PART TWOCHAPTER TWOTheory of the Farm Firm2.1 The Farm Firm

A number of authors (Jarrett and Dillon⁽¹¹²⁾, Hesser⁽¹⁸⁷⁾), have studied aspects of the farm credit market on a macro-economic basis. This line of approach has its limitations and assumes rationality, collective action and clear cut goals on the part of market actors. Simon^(156 p. 254) has written that macro-approaches "... make strong predictions about human behaviour without performing the hard work of observing people...". The approach to this study is based on the individual farm firm, and the conceptual framework draws on various aspects of behavioural, decision, finance and investment theory.

The farm firm is treated as conceptually different from its participants. It is assumed to have goals towards which it strives, but in farm firms there will be a close relationship between the goals of the firm and its owners. The assumption is also made that the firm has multiple changing goals over time, and that it moves towards its goals in a subjectively rational manner. The firm is therefore defined in the behavioural rather than the economic context.

Under this definition the economic theory of the firm does not offer an adequate theoretical framework for analysis. This theory has the attractions of simplicity and objectivity and can be reduced to two basic propositions:

- (i) that firms seek to maximise profits;
- (ii) that firms operate on a marginal basis.

In the behavioural context the economic theory can be criticised¹ as:

- (a) it is vague as to whether short or long term profits are referred to;
- (b) farm entrepreneurs particularly, may receive "psychic income" as a supplement or complement to economic income;
- (c) the theory includes only a small number of variables;
- (d) because of uncertainty, expectations are formed with limited knowledge and firms are unlikely to be able to maximise profits ex-post;
- (e) in practice firms do not invest close to the margin;

¹ In particular, see Simon⁽¹⁵⁶⁾ p. 262.

- (f) firms have other non-economic goals and these may dominate decision making;
- (g) in practice firms use short cuts and past experience in making decisions.

Behavioural theories as opposed to economic theories therefore share the premises that firm goals are something other than maximum profits,² and that profit maximisation is an unattainable goal anyway. This has led Simon⁽¹⁵⁶⁾ to develop the concepts of "limited bounded rationality" (i.e. that people are as rational as possible within limits) and "satisficing" (i.e. a rate of profit is satisfactory if it earns a firm a return at least equal to its aspiration level). Both these concepts are relevant to subsequent analysis.

2.2 Farm Firm Goals

The goals of a farm firm will be a function of a number of factors:

(i) Motivation

Penrose⁽⁴¹⁾ has written that "... people making decisions on behalf of a firm are acting in the light of some purpose, yet it is notoriously difficult to discover the true purposes of everyone...". The assumption is that motivations are revealed in the expression of utility (2.3).

² Catt⁽¹⁷⁵⁾ supports this thesis in a study of New Zealand business behaviour.

(ii) Expectations

Penrose⁽⁴¹⁾ argues that expectations are the prime determinants of firm behaviour, and Meyer and Kuh⁽³⁷⁾ suggest that such expectations are extrapolations of present experience. Farm firm goals are likely to be influenced by expectations in some way. An economic approach would suggest that the decision maker estimates the joint probability distribution of future events and maximises on this basis. Economic theory does not however indicate how such a distribution is determined. The behavioural approach to expectations is less objective in that expectations are not assumed to be independent of subjective influences.

(iii) Information

Classical economic analysis assumes that firms operate in an environment of perfect knowledge. Behavioural theory argues that the horizons and knowledge of firms will be limited. A firm will consider only a limited number of decision alternatives and through the effect of "filters",³ information actively utilised will be biased and incomplete. Information will still assist in the formation of expectations and goals, and the information search process can be treated as an economic

³ See Simon⁽¹⁵⁶⁾ and Cohen and Cyert⁽¹³⁾ p. 333, for further discussion of this concept.

factor of production (Cyert et. al.⁽⁷⁸⁾). Felstehausen⁽⁸⁷⁾ argues that the role of information in the farm business will be a function of the level of education of farmers, and their ability to participate in the formulation of national economic policies.

(iv) Time

As business goals are assumed to be dynamic in concept behavioural economists have developed the firm life cycle thesis, highlighting the changing sources of finance utilised as a firm grows. This genetic approach has been criticised by Penrose⁽¹⁴⁶⁾ who argues that "... to liken a firm to an organism in an attempt to explain growth is an ill-founded procedure...". However, Heady et. al.⁽⁹⁷⁾ and Wehrly and Atkinson⁽¹⁶³⁾ have both noticed changing attitudes to and patterns of investment in farm firms over time, and time is therefore considered to be a relevant factor in goal determination.

There is little agreement amongst business economists on what are basic firm goals. Baumol^(7 p. 295) writes that "... it is common experience when interviewing executives that they will agree to every plausible goal about which they are asked...". Baldwin⁽⁶³⁾, Penrose⁽⁴¹⁾, and Catt⁽¹⁷⁵⁾ consider growth to be an important goal. This would be particularly true for the farm firm where ownership and managerial roles are generally fully integrated.

Baumol⁽⁷⁾ considers a major goal of firms to be revenue maximisation, subject to a profit constraint. The desire for secure profits has also been discussed by McGuire,⁽³⁵⁾ and the goal of survival has been mentioned in the literature.⁴

Ferber considers that the security goal is important in the context of the farm firm. Control is also believed to be a major goal of such firms.⁽¹⁰⁾

To summarise these goals it is necessary to revert to the maximisation concept. Porterfield⁽⁴²⁾, Archer and d'Ambrosio⁽⁴⁾, and Cyert and March⁽¹⁶⁾ argue that the major goal of firms is the maximisation of discounted future satisfaction. Firms will try to maximise a utility function that includes components other than profits, though subject to some minimum profits constraint. This approach is consistent with the nature of farming where there are often strong non-economic motives at work. The measurement of satisfaction as the primary farm firm goal necessitates adoption of the utility concept (2.3) and the assumption is that farm firms wish to maximise the expected value of their utility at any moment in time. This approach has been adopted by Maddox and Chastain⁽¹²⁷⁾ in their study of farmer behaviour.

⁴ Ferber, R. "Implications of a Behavioural Theory of the Household for Production Economics", paper read before (176) 8th March 1966.

2.3 The Utility Function

Utility is defined as satisfaction. Utility theory does not account for preferences but tries to represent them in some way. Utility analysis is the process by which the expectation of outcomes of alternative activities are translated into expected utilities. The criterion of maximum expected utility is then applied to facilitate selection of the "best" action.

This approach to investigation represents an advance over the "certainty" or "certainty equivalent" methods, and is relevant in view of the behavioural definition which assumes that a farm firm will maximise the expected value of its utility (2.2), with respect to its participants' beliefs. Utility theory does allow for a subjective probability function measuring beliefs but this does not have much interpretative value in aggregate.

The problem of utility measurement is frequently discussed in the literature. Baumol⁽⁶⁴⁾ argues that ordinal measurement is arbitrary. Stigler⁽¹⁵⁹⁾ and Officer, Halter and Dillon⁽¹⁴²⁾ agree that as a "unit of utility" cannot be defined it is difficult to make inter-personal comparisons. The problem of attempting to aggregate utilities of component entities has been raised by Alchian⁽⁵²⁾, and there is a measurement problem arising as a result of the probabilistic nature of preferences.

Identification of preferences must come before measurement. This identification is difficult as farm entrepreneurs have vague likes and dislikes and are likely to make mistakes in reporting them. Fishburn⁽⁸⁸⁾ discusses and stresses the problem of time preference (2.2). The conclusion is reached that utility cannot uniquely be measured except perhaps under laboratory conditions. Luce and Raiffa⁵ have written that "... if it is so difficult to determine utility functions under the best of conditions, then there is no hope at all that it can be done under field conditions for situations of practical interest...". This observation is not refuted as a result of the evidence from practical measurement studies. A study by Halter and Beringer⁽⁹⁶⁾ concluded that:

- (i) Farmers with a high marginal utility per dollar of wealth tend to specialise in more risky enterprises;
- (ii) Farmers with a high marginal utility are more likely to incur debts than those with a low marginal utility;
- (iii) Farmers with a low equity and gross income have a greater marginal dis-utility per dollar of loss than farmers with higher incomes and equities.

⁵ Luce, R.D., and Raiffa, H. Games and Decisions - Introduction and Critical Survey, 7th ed., New York: J. Wiley and Sons, 1967, esp. Ch. 1.

These conclusions would have arisen from their study without quantitative attempts to measure utility. Another measurement attempt was made by Officer and Halter⁽¹⁴¹⁾ to examine the hypothesis that farmers' operating decisions were more consistent with the thesis of maximum expected utility than maximum expected dollar return. They developed the concept of an E-V curve to represent risk aversion. Using three separate methods of measurement (Von Neumanⁿ-Morgenstern, modified Von Neumann-Morgenstern, and Ramsey), they concluded that farmers had non-linear utility functions. They were forced to resort to money as a crude measure of utility, and could find no way of interpersonal utility function comparison. A third study by Officer, Halter and Dillon⁽¹⁴²⁾ attempted to represent stocking rate as a guide to farmers' attitude to risk. They related the shape of a resultant utility function to a farmer's equity, earning ability and other factors. Their conclusions were similar to those of Halter and Beringer⁽⁹⁶⁾ above.

Despite measurement problems the utility concept does provide a theoretical framework to the study of the farm firm. The approach has been described as the "cornerstone of decision theory",⁶ and Tversky⁷ suggests that it is useful in study of

⁶ Luce and Raiffa, op. cit.

⁷ Tversky, A. "Additivity, Utility and Subjective Probability". Journal of Mathematical Psychology, 4 (December 1967), 175-201.

behaviour. Since measurement is not the prime aim of analysis the utility function can be envisaged as separable (Gorman⁽⁹⁴⁾), and various levels of satisfaction can be easily associated with various levels of performance or achievement of goals. In this way Charnes and Stedry⁽⁷⁴⁾ consider the utility approach to investigation to be very worthwhile.

Discussion has reached the stage where the components of utility can be defined. The assumption is that farm firm utility results from ownership, profits, leisure, institutional relations, and growth. These concepts are subsequently discussed (2.8-2.12).

2.4 The Farm Firm - Decision Theory

Farm firm goals are revealed through its decision making and underlying goals are implicit in any decision making theory. The behavioural definition of the farm firm emphasises the critical role of uncertainty as a factor in decision making. Uncertainty will arise as any business decision is unique. It is dependent on the situation in which the decision is made, the goals and rationality of the decision maker and the information he has acquired. In the farm sector the pronounced interaction between rural culture and business management is likely to limit truly objective behaviour. Uncertainty will also

result from natural hazards and the consequent problems of day to day management of the farm business (Horton⁽¹⁰⁷⁾). Since the farm business life cycle is generally shorter than the corporate life cycle, Heady et. al.⁽⁹⁸⁾ believe that this uncertainty will force farmers to use a high discounting factor in making decisions, since there is relatively little time in the life of the business for correction.

Despite the problem of uncertainty, farm firm decision making is in accordance with developed business theories. These theories are based on the notion that business decision making is a relatively static procedure. Businesses follow regular decision procedures and a policy of relating future decisions to ex-post experience, rather than ex-ante forecasting. They also desire to "maintain the rules" (Cyert and March⁽¹⁶⁾), i.e. where an existing decision pattern satisfies the firm's goals, there is little search for alternatives. These factors inevitably mean that farm firms' decision making will be subject to considerable constraint and as a result actual decisions will deviate from economically optimal decisions. However the behavioural approach does allow an explanation of this conclusion, as the farm firm is assumed to be acting rationally if decisions made by it are in accordance with its stated goals.

2.5 The Finance Function

This function has been defined by Dauten⁽⁸⁰⁾ as:

"... that administrative area or set of administrative functions in an organisation which have to do with the management of flow of cash, so that the organisation will have the means to carry out its objectives as satisfactorily as possible, and at the same time meet its obligations as they become due..."

The function aims at achieving the most efficient utilisation of funds, given the firm's goals and decision methods. In the short term it aims to control the working capital position and maintain liquidity. The prime factor determining the average level of this active money will be the firm's income/expenditure period. The peculiar long term nature of this factor in many farm businesses demands a high standard of cash management expertise. The long term aim of the finance function is to establish the optimum (in the light of the firm's goals and decision making procedures) stock and utilisation of capital assets. Land is the prime capital asset in the farm business.

2.6 Investment Theory

function
Study of the finance/suggests the need to study the investment decision, since this decision implies the need for finance. Investment is defined by Meyer and Kuh⁽³⁷⁾ as "the time rate of change in a stock of desirable assets". In the light of earlier observations, the concepts

of economic investment theory must be modified to provide a suitable framework in the farm business context.

Traditional marginal investment theory assumes certainty, a static state of technology, an unlimited supply of funds at a constant rate of interest, and the profit maximisation goal. Some of these assumptions have already been relaxed. The theory states that a firm will invest to the point at which the discounted rate of return is equal to the current cost of borrowing. It stresses the role of the rate of interest in the investment decision, though this has not been supported by empirical evidence. Little work has been done in the farm business sector on the effect of interest rates. Jarrett and Dillon⁽¹¹²⁾ conclude that farm investment decisions are not significantly affected by interest rates and Back and Hurt⁽⁵⁾ show that these decisions are affected far more by income, knowledge and dollar investment required.

A dynamic theory of investment based on the accelerator principle is also inadequate as an explanatory framework. In naive terms the theory proposes that firms try to keep their total capital stock roughly proportional to their expected output. It makes unlikely assumptions that the farm firm will have no excess capacity and that funds can be obtained with little difficulty. Its major weakness is that it has no motivational content and is therefore not consistent with the behavioural approach adopted in the study.

Both these theories are inconsistent with the results of the direct enquiry approach to investment decision making. These studies have shown that internal liquidity and a strong preference for internal finance are prime factors determining a firm's investment (Meyer and Kuh⁽³⁷⁾). This informal approach is useful as a number of factors likely to affect farm investment decisions can be listed and investigated separately. The concept of "essential investment" has been examined in the literature by Porterfield⁽⁴²⁾ and Campbell⁽⁷³⁾. This investment decision bears no direct relationship to return or cost and the seemingly irrational behaviour can be accounted for by the influence of risk and uncertainty, and the assumption of a utility rather than a profit goal (2.2). The factors affecting farm firm investment at any instant of time are:

- (i) expectation of long term profits and/or growth;
- (ii) profits over recent time periods;
- (iii) current stock of capital;
- (iv) the availability of internal and external funds;
- (v) the attitude of the entrepreneur towards risk.

The effect of the stage in the farm life cycle (2.2) on the weight placed on each of these factors is important. Wirth⁽¹⁶⁴⁾ has concluded that if farm resources and investment could be re-arranged amongst the various

age groups of farmers, a greater productivity would result. The "echo effect" is therefore unlikely to play any great role in farm sector investment decision making. This phenomenon suggests that the older the existing capital stock of a firm, the greater will be its demand for replacement stock. Empirical evidence has not supported this thesis. It is more likely that Meyer and Kuh's "senility effect"^(37 p. 94) is in evidence in the farm sector. These authors suggest that firms with ageing equipment are likely to perpetuate that state in future. An empirical study of theirs found that there was a high correlation between age of capital stock and net quick liquidity in firms and concluded that dependence on old equipment was indicative of a conservative management that accumulated liquid assets at the expense of modernisation.

To conclude, in the light of the above discussion the most fruitful approach to investment decision making in farm firms is likely to be based on "direct enquiry". The effect of age of the firm is considered to be very relevant.

2.7 Finance of Investment

Finance is related to investment through the finance function (2.5). Overwhelming empirical evidence suggests that a farm firm will first look to its own retained earnings as a

source of investment finance (for example, Meyer and Kuh⁽³⁷⁾, Keen⁽¹¹⁷⁾, Paul⁽¹⁴⁴⁾, and Pearse⁽¹⁴⁵⁾). In the New Zealand farm sector this close relationship has already been observed. (1.4(i)). The role of external finance in agriculture though increasing, has traditionally been small. Campbell⁽⁷³⁾ noted in 1958 that:

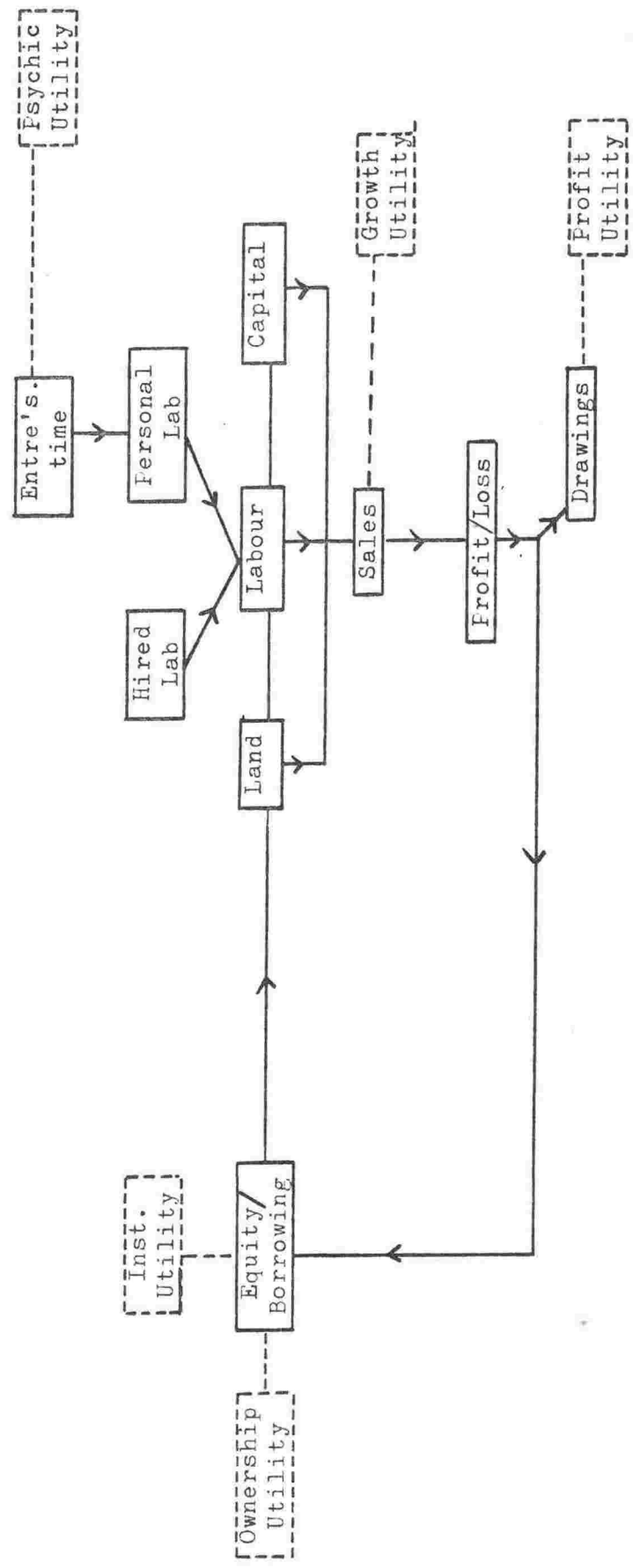
"... despite their continuing role in greasing the wheels of production, farm credit institutions provide very little of the real motive power for agricultural economic growth..."

The advantages of retained earnings as a source of funds are that they are relatively inexpensive, have no external risk, and will often avoid tax leakages.

Borrowing is an alternative method of finance and business theorists argue that the growth of a firm measured by both size and output, will depend on its use of external funds. This use will be a function of the institutional availability of credit (Baker⁽⁵⁸⁾), and the entrepreneurs' attitude to this availability. Empirical work has shown that internal capital rationing in business is the norm and it is explained by reference to firms' goals and subjective discounting procedures. In addition, Kalecki's principle of increasing risk has been cited as an explanatory framework. Farm firms have been shown by Patrick and Eisgruber⁽⁴³⁾ and Hesser and Janssen⁽¹⁰¹⁾, to rate debt repayment in preference to growth and investment.

Fig. 2.1

Diagrammatic Representation of Farm Firm Utility Scheme



The concepts of internal and external capital rationing have been well developed and tested empirically by Hesser⁽¹⁰⁰⁾. He showed in a survey of Central Indiana farmers that external capital rationing⁸ was a function of equity position, and that internal rationing was primarily determined by age, education, attitude towards credit, and knowledge of credit facilities.

2.8 Farm Firm Utility - Ownership

A diagrammatic representation of farm firm utility is drawn (Fig. 2.1).

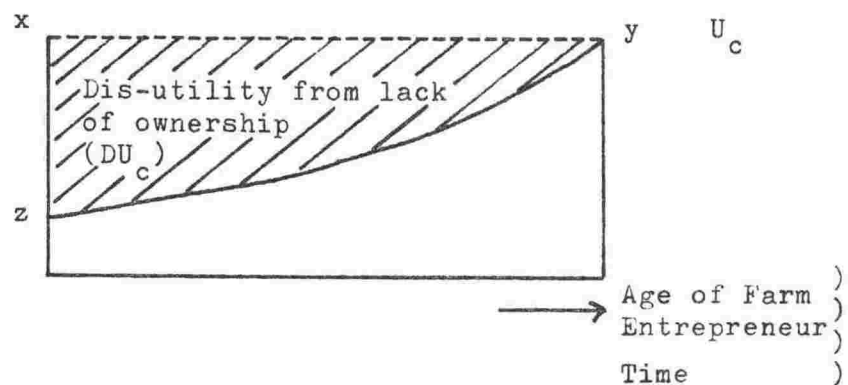
Ownership utility (U_c) is likely to be a function of the equity of a farmer in his business. The assumption is that a farm entrepreneur prefers a higher equity in his business to a lower, and that an older farmer anticipates a higher relative U_c than a younger farmer. U_c is likely to be related to time as:

- (i) in the early stages of the farm life cycle the pursuance of other goals is likely to bring greater satisfaction;
- (ii) in the later stages of the cycle, the profit and growth motives have been observed by Patrick and Eisgruber⁽¹⁴³⁾ to decline in importance.

⁸ Defined as "additional credit not being made available at going rates of interest because of impositions imposed by lenders".

- (ii) An increasing proportion of funds are likely to be devoted to debt retirement, as the ownership goal assumes increasing importance (Heady et. al. (98)). A naive partial U_c function is drawn (Fig. 2.2) and since measurement is not being made (2.3), the diagram is not to scale.

Fig. 2.2 Relationship of Naive U_c Function to Time



xy - maximum U_c at any time interval, resulting from 100% business ownership.

z - minimum U_c , related to entrepreneur's initial equity.

zy - increasing ownership over time, implying increasing U_c .

Evidence for the hypothesis might result from empirical observation of:

- (i) a strong relationship between equity and age of the farm entrepreneur;

- (ii) a strong relationship between reluctance to borrow mortgage money in the future, and age of the farm entrepreneur;
- (iii) a strong relationship between the business current assets/current liabilities ratio (reflecting internal financial strength and liquidity preference) and age of the farm entrepreneur/business;
- (iv) as anticipation of maximum U_c approaches at any instant of time, dis-utility is likely to be less than at lower equities. It is likely that some dis-utility may be reflected by criticism and complaint.

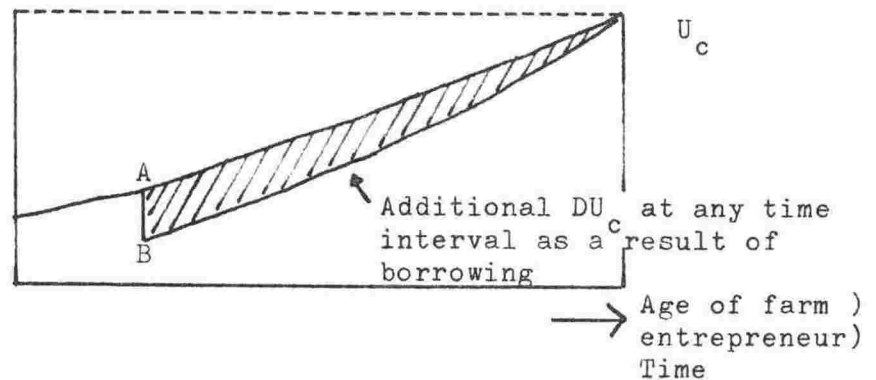
A decision to increase mortgage debt will reduce U_c , say from OA to OB (Fig. 2.3). For such a decision to be subjectively rational, expected additional utility from other Total Utility (U_t) components must be greater than additional DU_c . Since a sub goal of the farm firm is to maximise U_c at some stage in the life cycle then

$$\frac{\Delta BC}{\Delta T} > \frac{\Delta AC}{\Delta T}$$

i.e. a farm firm would expect to approach the limit U_c at a faster rate after borrowing additional mortgage finance at some stage of the life cycle than if it did not borrow. An empirical observation might be that those farms who are borrowing, or anticipating additional term borrowing

are growing, or are expected to grow at a faster rate than others.

Fig. 2.3 Effect of Borrowing on Naive U_c Function



2.9 Farm Firm Utility - Growth

Growth of the firm has been defined in a number of ways, none of which is entirely satisfactory. Bailey⁽⁵⁷⁾ defines growth as an increase in input and output volume. Baker and Hopkin⁽⁶⁰⁾ argue that growth can be measured through rate of income flow or equity. In cost of capital analysis, Modigliani and Miller⁽¹³⁴⁾ stress a market value rather than an income concept of growth.

That growth is a sub goal of the farm entrepreneur is confirmed by Renborg⁽¹⁵⁰⁾. Utility results from growth, and Simon⁽⁴⁵⁾ argues that a growing firm offers greater opportunities for prestige and further advancement than one that is static or declining.

A number of firm growth models have been described in the literature. Halter⁽⁹⁵⁾ suggests that growth depends on retained and borrowed funds available for expansion. The same view is held by Gilchrist⁽⁹³⁾ who has developed a theoretical farm growth model to take into account the effect of tax, family size, unpaid income and standard of living. Williamson's growth model, described by Renborg⁽¹⁵⁰⁾, stresses the link between profit in one year, and capital investment in the following.

For farm firm growth to occur Bailey⁽⁵⁷⁾ lists five preconditions and these summarise the content of the major theories:

- (i) excess managerial capacity;
- (ii) satisfactory initial profitability of the business;
- (iii) minimum starting size - i.e. surplus cash available after farm living expenses;
- (iv) some unused resources;
- (v) external funds available.

Bailey stresses the role of debt in the growth process and Baker and Hopkin⁽⁶⁰⁾ have considered this role. Without borrowing growth is determined wholly by the earnings rate, and they show that even a small leverage can significantly influence the growth rate defined as both volume of output, or size of business. The extension of this observation is that if there is this dynamic relationship between borrowing and growth rate, then there is likely to be a static relationship between volume of output or business size and debt load.

In the behavioural context, risk, managerial deficiency and the ownership goal (2.8), rather than finance, are considered to be major growth limitations. This satisficing (2.1) approach to growth suggests that a firm will accept a satisfactory, rather than an optimal growth plan. Renborg⁽¹⁵⁰⁾ suggests that this approach "... seems to have potential for handling farm growth planning problems..."

Accepted assumptions are that growth brings satisfaction, and results from investment in farm assets, financed either by retained earnings or borrowing. This use of retained earnings invites discussion of the farm-home conflict (Heady et. al.⁽⁹⁷⁾, Maddox and Chastain⁽¹²⁷⁾). A priori knowledge would suggest that:

- (i) investment in the home assumes low priority in the farm entrepreneur's decision making;
 - (ii) farmers are not prepared to borrow for home investment.
- These hypotheses are subsequently examined empirically.

The extent to which farm firms borrow for on-farm projects in an attempt to increase their growth rate will be reflected by their use of credit facilities. These uses will be a function of the farmers' current utility preference combination. It is hypothesised that:

- (i) use made of credit facilities and,
- (ii) willingness to borrow for project purposes,

will both be a function of identifiable parameters and will vary over time.

When actual farm firm growth rate is less than subjective optimal growth rate, there is likely to be evidence of external capital rationing. This will be revealed through criticism of such institutional factors as loan limits and borrowing terms, and it is hypothesised that dis-utility is related to age and/or equity. It is envisaged that growth utility (U_g) as a source of total utility decreases relatively with age of the farm business. This state might be reflected by increasing reliance on internal funds as a source of finance.

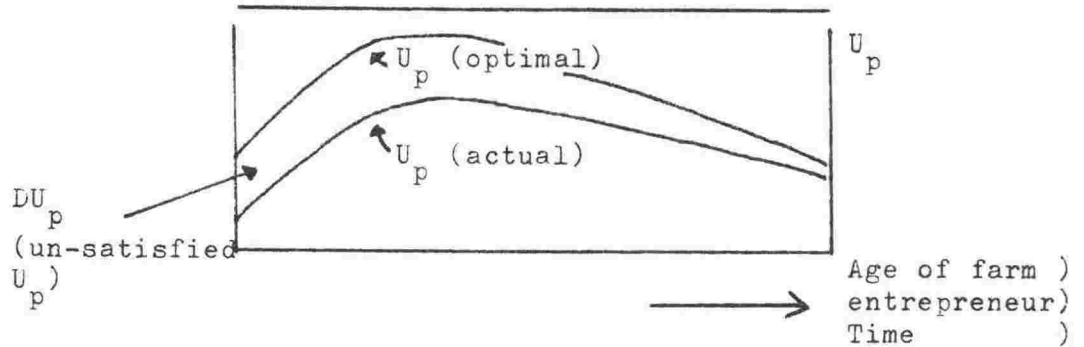
2.10 Farm Firm Utility - Profits

Whilst some authors consider profits to be evidence of growth (2.9), in this analysis a split has been made, with the assumption that profit utility (U_p) is a dynamic function of the level of profits. (Fig. 2.4). This is because:

- (i) with the observed use of retained earnings as a stimulus to growth (2.9), U_p is logically prior to U_g ;
- (ii) drawings (an expression of U_p) are related to profits earned.

Drawings made will imply U_g foregone.

Fig. 2.4 Relationship of Naive U_p Function with Time



A priori U_p will rise as the farm entrepreneur gains experience, and farm performance is likely to improve. As the life cycle continues the rate of increase will decelerate and start to decline, as the entrepreneur begins to realise his limitations (old age, failing strength), adjusts his goal mix, and attempts to maximise U_t in other ways. Even though real profits may be constant, U_p is likely to change over time. It is envisaged (but not subsequently examined) that subjective optimal U_p will be greater than actual U_p , though the latter will tend to the optimal level. DU_p will diminish over time as profit goals are adjusted to reflect ex-post aspirations and experiences. Aspirations might be expected to be greater than actual performance in the early stages of the business cycle as they are based on limited real experience.

2.11 Farm Firm Utility - Institutions

It is reasonable that a farm entrepreneur will try to deal with a financial institution where he feels "happy" and "contented".

(a) Mortgage Institutions - Utility (U_{Im})

A farm firm with perfect knowledge will search to borrow from its optimal financial institution, in order to try to maximise U_{Im} over time. Whilst the rigidity of the mortgage system will hinder an entrepreneur's efforts to maximise U_{Im} , ex-post sub-optimal selection might be reflected by:

- (i) criticism of current institution;
- (ii) search for alternative sources of finance, should goals permit future term borrowing.

Farm firms with no outstanding mortgage will have zero U_{Im} . For such firms U_c will be maximised.

(b) Other Institutions - Utility (U_{Is})

A farm entrepreneur is assumed to gain some utility by operating a bank account and utilising bank services. It is reasonable to

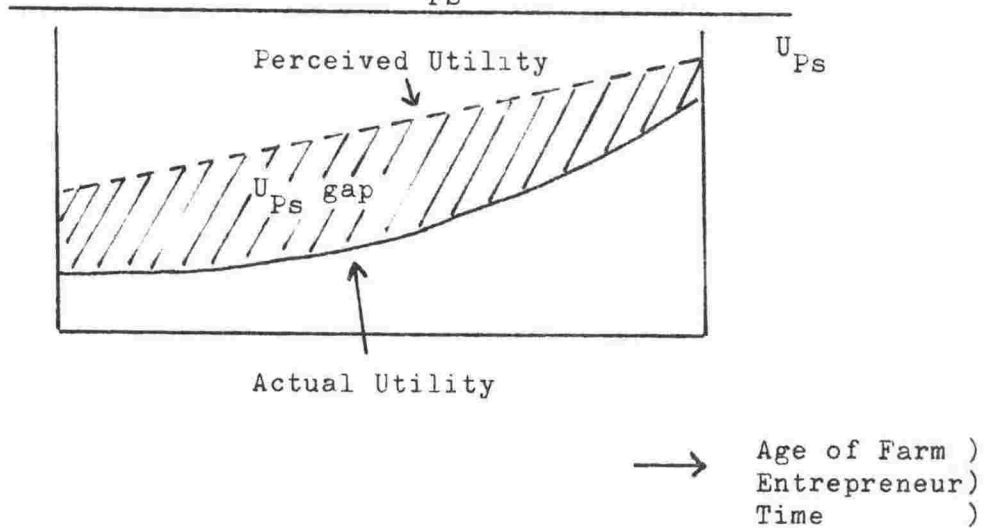
assume that a farm entrepreneur will deal where he expects to derive maximum U_{IS} , and that a sub-optimal choice will be remedied by a transfer of account. It is also hypothesised that U_{IS} will increase over time, as banker and customer establish a stable relationship ⁹.

Since there is a duplication of many financial services offered by banks and stock firms, there is likely to be some spread of business. The optimum split to maximise U_{IS} could in theory be identified through an indifference curve approach. A priori knowledge suggests that there is likely to be marked preference in the allocation of financial business between firm and bank and this preference may be a function of an entrepreneur's limited bounded rationality (2.1).

2.12 Farm Firm Utility - Psychic Utility

The concept is difficult to define, and is discussed only for completeness. Psychic Utility (U_{PS}) includes factors such as the psychic benefits of the farming way of life and the amount of time spent on leisure. The function is assumed to be dynamic over time (Fig. 25).

⁹ (4) p. 408.

Fig. 2.5 Relationship of Naive U_{Ps} Function with Time

The rationale of this figure suggests that optimal perceived utility will increase over time. As the entrepreneur ages he discovers an increasing range of experiences to be enjoyed, and uses to be made of leisure time (Marris⁽¹²⁹⁾). Early in the life cycle, marginal satisfaction derived from attempts to satisfy other goals is likely to be greater than marginal satisfaction from U_{Ps} . Later in the life cycle the farm entrepreneur will derive relatively more U_t from "psychic" sources by substituting, perhaps by necessity, leisure for work. Thus U_{Ps} (actual) will tend to U_{Ps} (perceived). It may never reach this level, as U_{Ps} (perceived) may by definition be limitless.

2.13 Conclusion

The behavioural framework is based on the farm firm

life cycle. Emphasis has been placed on the dynamism of ~~farm~~ firm goals which may be complementary, supplementary or diametrically opposed to each other. In this loose framework the effect of information on goal formulation has not been fully considered. Neither have relevant personal characteristics of the farm entrepreneur (such as number and ages of sons) been discussed that may influence the goal structure of his firm, and the use made of financial facilities to attain these goals. These and other factors will be utilised in subsequent analysis as appropriate.

CHAPTER THREE

THE FARM CREDIT SURVEY:SUMMARY OF AGGREGATE DATA3.1 Introduction

The aims of the Lincoln College Credit Survey were the collection of data to help describe the operations of the farm credit market, and to either support or refute considered theory in Chapter Two. Whilst the survey of 381 farm businesses was made on a sample basis, its random nature does ensure that some population conclusions can validly be drawn. Results of the survey investigation are discussed in relation to considered theory (Chapter Two), in Chapter Nine, and in relation to Policy Factors in Chapter Sixteen. A description of the sample selection procedure is given in Appendix B, and some detail of questionnaire design and survey organisation in Appendix C.

3.2 The Farm Entrepreneur

To ensure that entrepreneurs played both an ownership and a managerial role in their businesses, a consistent selection process would have been necessary to restrict the choice of sample to owner occupiers. Eighty-five per cent of respondents did fulfil this criterion.¹

¹ Those farmers with perpetual or long term renewable leases on their properties have been treated as equivalent to owner occupiers in the study.

A further 11% of respondents were partners. In all cases they played a managerial role in the business, and contact with other partners would have been unlikely to reveal appreciably more, or conflicting information. Some bias will have resulted from the interview of salaried farm managers and such entrepreneurs represented 2% of total respondents. This separation of the ownership and management functions has led to problems of data interpretation. In some cases the business owner exercised complete control over the finance function and in others adopted a completely passive role. For expediency in the assessment of the data the manager was treated as if the owner.

A similar interpretation problem resulted from the inclusion of share-milkers in the survey, representing 2% of interviewees. Though share-milkers were not specifically excluded from the sample, interviewers were under instructions to contact if possible the business owner. In these cases this was not possible and the share-milker was treated as if the business owner. Inevitably this treatment led to a low equity rating, which as a result would bias aggregate figures downwards. It was considered that in view of the small number of managers and share-milkers interviewed, separate analysis would not be useful. The results of such interviews have therefore been merged with aggregate figures.

3.3 Personal Characteristics of the Farm Entrepreneur

In some ways the sample corresponded well with standard statistical distributions. Data was collected on respondents' age, and a normal curve fitted to this distribution. The goodness of fit was calculated, and the null hypothesis accepted that there was no significant difference between observed data and a normal distribution. The mean age of respondents was 46. Data was also collected on their farming experience ("number of years in farming on own account"), and period of occupancy of present property. Whilst there were too few class intervals to allow any theoretical curve to be fitted and tested, it is likely that these distributions would have been normal. The mean farming experience of entrepreneurs on their own account was 18 years, and the average length of current occupancy was 16 years. As a group dairy farmers had significantly less farming experience than others. Their average length of occupancy was also less. Dairy farmers tended to be younger than others, but this hypothesis was not accepted at a significant level.

Only 76% of respondents had received any secondary education. This is somewhat lower than an estimated 90% of the working population at large who have received at

least some post-primary education.² Nine per cent of respondents had received post-school technical training, and three per cent had a University degree. These figures are similar to the pattern of educational qualifications of the national working population. The 1966 Population Census estimated that 11.3% of this population had some post-school training, and three per cent had a University degree.³

3.4 Farm Management Practices

In an attempt to assess the role of information in the business some material was collected on farm management practices. Nearly one-third of respondents were members of farmer discussion groups, or at least intimated that they had some form of similar educational contact with other farmers. Farm advice had been sought from qualified sources during the previous 12 months to date of interview by two-fifths of respondents. As an indication of financial planning and foresight, budgets were regularly prepared by only 14% of farmers in association with their advisors. Thirty-three per cent stated that they prepared

² Dept. of Education, and Dept. of Extension Studies, University of Canterbury, pers. comm., Feb. 1971.

³ See Table "Educational Qualifications of the Labour Force", N.Z. Year Book, 1969, p. 235.

budgets of various degrees of sophistication themselves, but over half of all farmers interviewed did not employ budgeting techniques in their businesses. Many of these farmers were extremely sceptical of any benefits of this financial tool. Highly significant relationships were observed between age of farmer and use made by him of both advisory services and budgeting techniques. As a group, dairy farmers were significantly more active participants in discussion groups than other types of farmer.

The general conclusion is that ^{over} 50% of entrepreneurs are not utilising available external sources of information, or financial planning techniques to any extent. The sector is relatively immobile and decision making is controlled by middle-aged, rather than young entrepreneurs. (3.3).

3.5 Financial Parameters - Equity

Four parameters were selected in an attempt to summarise the overall financial structure of the sample businesses. These are discussed below, 3.5-3.8 inclusive.

The equity ratio represents the extent of real control exercised by a farmer over the imputed value of total farm assets employed in his business. It is expressed as a percentage. Total farm assets were deemed to include land and improvements (including buildings), stock and plant and machinery. Livestock as at June 30th 1970 was valued at

conservative but consistent standard values. All cattle was valued at \$30 an animal, and all sheep at \$5 an animal. Plant and machinery was taken at Balance Sheet value. Land valuation was more complex. Government Valuation, the basis of estimation, is assessed quinquennially. For some counties in the Survey this valuation was therefore up to five years out of date. Updating factors were calculated where necessary to attempt to ensure a consistent measure at 1970 imputed valuation. These factors were assessed for each county after:

- (i) examination of the trend of Government Valuation figures in that county since 1950;
- (ii) examination of national valuation trends since 1950;
- (iii) examination of the trend and magnitude of more recent valuations in adjacent counties;
- (iv) discussion with representatives of the Valuation Department.

Third party claims on total farm assets included mortgage principal owing, non-secured funds owing to private persons, and funds owing to trading banks, stock firms and dairy companies. Total debt stock on each farm business was estimated as at June 30th 1970. Figures of short-term debt represented the overdraft limit of the farmer at that time, or the maximum debt level attained during the financial year 1969/70, whichever was greater.

To calculate equity as at June 30th 1970 the formula was used:

$$\text{Equity} = \frac{\text{Total farm assets} - \text{Total debt}}{\text{Total farm assets}}$$

In many cases this figure represents a downward bias of real equity position. Government Valuation figures are often lower than property values on the open market. Private and family debt is often in the nature of a gift, but recorded in the accounts for taxation purposes. The concept of "maximum" short-term debt as described above is not necessarily indicative of the average situation during the year. It also takes no account of off-farm assets and income. From field observation such items played a role in the business finance function of many farmers.

Using this equity concept, only 25% of sample farmers had an equity of less than 50% in their business (Table 3.1). The distribution is expressed as a cumulative percentage and does represent unbiased estimates of the equity position of the 18 counties in which interviewing took place (Appendix B).

Approximate standard errors have been added. For instance, the percentage of farmers with an equity of less than 50% in their businesses is 25 (± 4.62) of the population county farmers, or the 95% confidence limit.

To the extent that the Survey counties are typical, the figures do represent the equity situation of New Zealand farm businesses as at June 30th 1970. The mean equity based on aggregate

real data was 71.6%, and the distribution was negatively skew. Ceteris paribus, these figures do not indicate an excessive debt burden on New Zealand farm businesses.

Table 3.1

Equity Position of a Sample of 368
New Zealand Farm Businesses
(As At June 1970)

<u>Equity (%)</u>	<u>%</u>	<u>Cum. %</u>	<u>Approx. s.e.</u> ⁴
Below 10	3.3	3.3	0.9
11 - 30	7.8	11.1	1.6
31 - 50	13.9	25.0	2.3
51 - 70	19.8	44.8	2.7
71 - 90	31.6	76.4	2.3
91 and over	23.6	100.0	-

3.6 Net Profit to Gross Sales Ratio

The ratio gives some indication of short-term profitability relative to sales volume. It was calculated for each business from balance sheet data. The ratio should be interpreted with extreme care, as accounting measurement is not necessarily reconcilable with conceptual economic theory. Taxation provisions by allowing the charging of some capital expenditure against profit and loss account distorts the true "net profit" position. In any one year the ratio may not reflect a true "norm" of the farm business, if that in itself is measurable. The cross-section random nature of the sample

⁴ From "Standard Errors of Various Percentages with Given Sample Sizes", Table 1, of Parten, M., Surveys, Polls and Samples, New York: Harper Bros. 1950, p. 309.

selection is likely to minimise the net effect of these distortions.

Table 3.2

Net Profit to Sales Ratio for a Sample
of 368 Farm Businesses
(Accounts y/e June 1970)

<u>Ratio Class (%)</u>	<u>% of obs.</u>	<u>Cum. %</u>	<u>Approx. s.e.</u>
less than zero	7.3	7.3	1.4
1 - 20	25.0	32.3	2.4
21 - 40	46.5	78.8	2.1
41 - 60	21.2	100.0	-

A normal curve with mean of 26.7% and standard deviation 16.7% was fitted to the distribution. There was no significant difference between observed and theoretical frequencies, and the conclusion was that the ratio has a normal distribution.

3.7 Net Profit to Total Farm Assets Ratio

The ratio gives an indication of the simple rate of return on assets employed in the farm business. Net profit figures were taken from balance sheet data, and interest payments and imputed management salaries and allowances were added back where necessary. This adjusted net profit figure represented the reward to management, self labour and capital. Conceptual problems of allocating net profit to these factors prevented the determination of return to capital alone. In

any case it was considered unlikely that the majority of farmers make such a calculation in their business analysis. Major limitations in the interpretation of this ratio are that it is an average and static measure, rather than a marginal and dynamic one. It does not treat capital gain as an income concept, and has been calculated from theoretically inadequate accounting data. Results showed that the ratio has a positively skewed distribution, with mean of 5.4%, and standard deviation of 4.8% (Table 3.3).

Table 3.3

Net Profit to Total Farm Assets Ratio for a Sample
of 368 Farm Businesses (Accounts y/e 30th June 1970)

<u>Ratio Class (%)</u>	<u>% of obs.</u>	<u>Cum. %</u>	<u>Approx. s.e.</u>
Less than zero	7.3	7.3	1.4
1 - 5	52.8	60.1	2.6
6 - 10	25.8	85.9	1.9
10 and over	14.1	100.0	-

Whilst there are some businesses earning high rates of return relative to the rest of the economy, the majority are earning low rates, with the modal class between one and five per cent on their farm assets. Average return on capital alone is likely to be lower than these figures.

3.8 Current Assets to Current Liabilities Ratio

The ratio gives an indication of the ability of a business to meet its current obligations. It is presented as a static measure but is dynamic in the course of business operations. Foulke⁵ suggests that an accepted safe ratio is two-to-one and shows that this is the approximate historical norm for a number of American businesses. In this study figures were taken directly from balance sheet data. In cases where livestock had been recorded as a current asset an adjustment was made on the grounds that stock is a capital rather than a short-term asset.⁶ As the financial structure of many farm businesses is relatively simple, the observed ratio was often equivalent to the "acid test" ratio. This ratio places emphasis on real liquidity in terms of cash convertibility rather than simply on aggregate current assets. The distribution pattern of observations (Table 3.4), shows that 55% of businesses had a liquidity ratio of less than two to one. Whilst this does suggest an overall illiquid business structure, the ratio is only relative, and does not take into account volume

⁵ Foulke, R.A. Practical Financial Statement Analysis, 5th ed., New York: McGraw-Hill, 1961, p. 178.

⁶ Balance Sheet classification of livestock is a controversial matter, and was a discussion feature of the 1971 Farm Accounting Course, Lincoln College, February 1971.

of assets and liabilities.

Table 3.4

Current Assets to Current Liabilities Ratio for a Sample
of 368 Farm Businesses (accounts y/e 30th June 1970)

<u>Ratio Class</u>	<u>% of Obs.</u>	<u>Cum. %</u>	<u>Approx. s.e.</u>
Under 2.0	55.4	55.4	2.7
2.1 - 4.0	16.1	71.5	2.4
4.1 - 6.0	7.0	78.5	2.2
6.1 - 8.0	4.1	82.6	1.9
Over 8.1	17.4	100.0	-

The mean was 5.8 to one, but was influenced by extreme observations. In this case the median, of 1.4 to one, would be more indicative of the "typical" liquidity situation.

3.9 Relationship between Financial Parameters

The four structural parameters (3.5 - 3.8) are used in subsequent analysis. To facilitate broad comparison of business structure, performance and behaviour, the total number of observations of each ratio was divided into quartiles. For example, future reference to "Equity Quartile One" refers to that 25% of the sample (or 92 farm businesses) with the lowest equity. Reference to "Equity Quartile Four" refers to that 25% of the sample with the highest equity. Table 3.5 summarises data classified in this way and related to farm type. Comparison between the two principal farm types (O1 and O2) reveals two highly significant observations:

- (i) Equity is lower in dairy than in sheep businesses;
- (ii) The profitability (3.6) and return (3.7) ratios are higher for dairy than for sheep businesses.

The significance of these results in relation to considered theory and Survey results is discussed in Chapter Nine.

Figures are also presented in Table 3.5, of respective quartile means and standard deviations. Study of the equity data indicates a change from a platykurtic type distribution for businesses in quartile one, to a leptokurtic type distribution for businesses in quartile four. Liquidity data indicates a similar transition of distribution type, in reverse.

The distribution of the other two ratios shows that standard deviations are higher in the extreme quartiles. This result is consistent with an aggregate normal type distribution.

Table 3.5

Ratio Quartiles Analysed According to Type of Farm
(as at June 1970)

TYPE OF FARM ¹	Equity Quartile				Profit/Sales Quartile				Profit/Assets Quartile				C.A./C.L. Quartile			
	1	2	3	4	Tot. 1	2	3	4	Tot. 1	2	3	4	Tot. 1	2	3	4
01 Principally Dairy	35	14	20	12	81	12	10	29	30	81	8	16	24	24	23	18
02 Principally Sheep	14	30	27	37	108	28	32	23	25	36	38	25	30	22	31	108
03 Principally Beef	2	2	0	1	5	2	1	0	2	1	1	1	0	0	1	5
04 Dairy/Sheep (Dairy pred)	2	4	4	1	11	2	2	2	5	11	2	0	6	2	1	11
05 Dairy/Beef (Dairy pred)	0	1	1	1	3	0	1	1	1	3	0	0	1	1	1	3
06 Sheep/Dairy (Sheep pred)	0	0	2	1	3	1	0	0	2	3	1	0	2	0	0	3
07 Sheep/Beef (sheep pred)	22	22	15	18	77	21	21	17	18	77	15	21	18	16	23	77
09 Beef/Sheep (Beef pred)	3	1	2	5	11	5	4	1	1	11	5	2	2	1	4	11
10 Mixed Livestock	2	3	3	5	13	1	4	7	2	13	2	6	3	3	8	13
11 Sheep and Cropping	3	4	5	8	20	8	7	4	1	20	11	2	5	5	1	20
12 Principally Cropping	3	2	1	0	6	1	3	1	1	6	2	2	4	1	1	6
13 General Mixed Farming	3	4	5	2	14	8	2	3	1	14	7	3	2	2	4	14
14 Market Farms and Gardens	3	5	6	1	15	3	5	4	3	15	2	2	4	4	4	15
15 Other	0	0	1	0	1	0	0	0	1	1	0	0	1	1	0	1
Total	92	92	92	92	368	92	92	92	92	368	92	92	92	92	92	368
Quartile Mean	30.5	63.8	82.3	97.1	71.6	3.3	23.0	32.9	47.8	26.7	0.6	3.9	6.5	13.1	5.4	0.3
Standard Deviation	16.9	7.0	4.6	3.1	26.7	19.2	3.2	3.5	6.1	16.7	2.7	0.6	1.0	7.6	4.8	0.2

¹ Classification of Farm Type based on income source from Dept. of Statistics, Farm Production Statistics 1967 (Occupier Schedule). No farm type 08 (Beef/dairy - beef predominant) was sampled in the survey.

Principally - over 75% farm income from stated production.
Predominant - over 50% " " " first stated production.

The overall relationship between all observations of these financial ratios was examined to determine the presence of multicollinearity. The correlation matrix (Table 3.6) shows that apart from an expected relationship between ratios two and three, there was a lack of any significant multicollinearity. In analysis the ratios were therefore deemed to be largely independent of each other.

Table 3.6

Correlation Matrix of Financial Ratios

	1	2	3	4
1	1.00			
2	0.20	1.00		
3	0.05	0.58	1.00	
4	0.25	0.16	0.05	1.00

Key: 1. Equity Ratio.
 2. Net Profit/Sales Ratio.
 3. Net Profit/Total Farm Assets Ratio.
 4. Current Assets/Current Liabilities Ratio.

3.10 Age of Farm Operator

A priori knowledge suggested that age of farmer was related to business structure, behaviour and use of credit facilities. Results of business financial structures and performance classified according to age group of operator have been presented in Table 3.7. Whilst these figures are averages and conceal variances, they do add some substance to the life cycle thesis. Average total farm assets

employed show an increase and subsequent decline with age. Similar observations have been made by Garlock⁽⁹²⁾ on United States data. Business performance (gross sales and net profit) show a similar rise and fall but profitability and return ratios show a positive correlation with age. Relative liquidity shows a similar relationship, adding support to the liquidity preference concept (2.6).

Table 3.7 shows that a decline in average business debt, both absolutely and relatively, was associated with age of operator. The mean equity of each age group in their businesses was calculated and statistical testing (F-test) showed that there was a highly significant difference between means of respective sub-samples. In addition short-term debt expressed as a percentage of total liabilities shows an increase and subsequent decline with age of farmer. These observations confirm that there are significant relationships between age of operator and business parameters.

Table 3.7

Average Financial and Business Characteristics of a Sample of 368 New Zealand Farmers
Classified According to Age Group of Operator. (Accounts Y/e 30th June 1970)

	21-30		31-40		41-50		51-60		61 and older		All Farmers	
	\$	%	\$	%	\$	%	\$	%	\$	%	\$	%
<u>Assets</u>												
Land (updated Govt. Valn.)	56,959	77.9	72,250	78.0	74,922	78.4	66,789	81.8	59,086	83.6	69,182	79.5
Livestock (const. standard values)	11,791	16.1	15,363	16.6	14,105	15.2	10,759	13.2	7,861	11.1	12,726	14.6
Plant and Machinery	4,335	6.0	5,042	5.4	6,542	6.4	4,079	5.0	3,741	5.3	5,095	5.9
Total Farm Assets	73,085	100.0	92,655	100.0	95,569	100.0	81,627	100.0	70,688	100.0	87,003	100.0
<u>Liabilities</u>												
Maximum Bank o/d	1,752	5.7	2,265	7.2	3,123	10.8	1,953	10.9	962	15.2	2,270	9.2
Maximum Firm o/d	2,733	9.0	1,937	6.1	2,526	8.7	2,155	12.0	128	2.0	2,043	8.3
Total Short Term Liabilities	4,485	14.7	4,202	13.3	5,649	19.5	4,108	22.9	1,090	17.2	4,313	17.5
Unsecured Private Money	1,258	4.1	2,300	7.3	1,034	3.6	360	2.0	333	5.3	1,122	4.5
Mortgage Principal o/s	24,781	81.2	25,150	79.4	22,318	76.9	13,475	75.1	4,915	77.5	19,276	78.0
Total Farm Liabilities	30,524	100.0	31,652	100.0	29,001	100.0	17,943	100.0	6,338	100.0	24,711	100.0
(1) Equity (%) ¹	58.2		65.8		69.7		78.0		91.1		71.6 ³	
Gross Sales ₁	13,827		16,144		19,247		17,069		11,377		16,639	
Net Profit	2,849		4,041		4,590		4,514		3,327		4,158	
(2) Net Profit/Gross Sales (%)	20.6		25.0		23.9		26.5		29.2		25.0 ³	
(3) Net Profit/Total Farm Assets (%)	3.9		4.4		4.8		5.5		4.7		4.8 ³	
Current Assets ¹	5,848		9,174		9,077		9,029		5,134		8,393	
Current Liabilities ¹	6,097		7,093		6,435		4,939		1,680		5,679 ³	
(4) Liquidity Ratio ²	1/1.04		1.29/1		1.41/1		1.83/1		3.06/1		1.48/1 ³	
No. of farmers in sample	29		92		115		92		39		368	

- Notes
1. Crude balance sheet data.
 2. One farmer under 20 years old has not been included in the analysis.
 3. Mean calculated from actual performance data, and not from ratio distribution.

3.11 Farm Type and Regional Analysis

Data was originally analysed on a regional and farm type basis. Farm type was determined on a "source of income" basis and followed Department of Statistics classification (see Table 3.5). There was a close relationship between results from a particular farm type and the geographical region in which it was predominant. In order to avoid duplication it was decided to omit regional analysis except where the specific influence of a regional factor was of particular importance in explanation. In any case financial behaviour was observed to relate more to farm type and personal characteristics of farmer, than to spatial factors. This is consistent with a behavioural approach to investigation.

Financial and business characteristics have been presented for the five most common farm types, as generated by the Survey (Table 3.8). Farm asset structure data indicates the relatively greater role of livestock as a business asset of dairy than sheep farming. The importance of plant and machinery as an asset of market gardening businesses is highlighted. Debt structure patterns show the relatively greater role of term debt in dairy than other farm types. The importance of stock firm finance is closely related to sheep and sheep type businesses. The differences in equity and performance ratios of some farm types have been observed (3.9). Study of liquidity

ratios show that relative liquidity is broadly similar for businesses of the farm types illustrated. The size of the average dairy business is significantly smaller than the size of an average sheep business.

3.12 Conclusion

The summary of aggregate Survey financial data has shown that external finance does play a role in the farm business structure. The Agricultural Production Council has used these results to confirm that this role is increasing (168 p. 59). Data also shows that the role of external finance can be related to the age of farm operator (3.10), and type of farm business (3.11).

Table 3.8

Average Financial and Business Characteristics of a Sample of 368 New Zealand Farmers
Classified According to Type of Farm, (Accounts y/e 30th June 1970)

Type of Farm	Principally		Principally		Sheep/beef		Sheep/cropping		Market Gardening	
	\$	%	\$	%	\$	%	\$	%	\$	%
<u>Farm Assets</u>										
Land (updated Govt. Valn.)	88,696	84.1	53,632	77.1	65,198	75.5	88,354	86.0	63,304	87.4
Livestock (const. standard value)	10,978	10.4	11,896	17.1	17,670	20.5	6,903	6.7	397	0.5
Plant and Machinery	5,850	5.5	4,042	5.8	3,434	4.0	7,456	7.3	8,703	12.1
Total Farm Assets	105,524	100.0	69,570	100.0	86,302	100.0	102,713	100.0	72,404	100.0
<u>Farm Liabilities</u>										
Maximum Bank o/d	1,362	5.8	1,581	7.0	3,144	11.2	929	3.3	3,680	13.8
Maximum Firm o/d	2,677	11.4	238	1.1	2,815	10.0	5,095	18.1	1,187	4.5
Total Short-Term Liabilities	4,039	17.2	1,819	8.1	5,959	21.2	6,024	21.4	4,867	18.3
Private Money	1,073	4.6	694	3.1	639	2.3	1,112	3.9	500	1.9
Mortgage outstanding	18,347	78.2	20,094	88.8	21,494	96.5	21,080	74.7	21,236	79.8
Total Farm Liabilities	23,459	100.0	22,607	100.0	28,092	100.0	28,216	100.0	26,603	100.0
(1) Equity (%)	77.8		67.5		67.4		72.5		63.3	
Gross Sales	16,197		12,389		19,945		16,251		30,206	
Net Profit	3,932		4,203		5,010		3,110		6,547	
(2) Net Profit/Gross Sales (%)	24.3		33.9		25.1		19.1		21.7	
(3) Net Profit/Total Farm Assets (%)	3.7		6.0		5.8		3.1		9.0	
Current Assets	10,478		3,935		9,941		12,128		8,438	
Current Liabilities	6,433		2,304		6,300		7,540		6,005	
(4) Current Assets/Current Liabilities	1.6/1		1.7/1		1.6/1		1.6/1		1.4/1	
No. of farmers in sample	107		81		77		20		15	

Note In some cases sub-samples are small. Whilst data does represent unbiased point estimates of farm type characteristics, variances are not necessarily small.

CHAPTER FOURThe Farm Credit Survey:
Mortgage Market4.1 Introduction

At June 1970 average mortgage debt outstanding per farm business represented 22% of on-farm assets and 78% of the total debt load. The average mortgage debt load per business increased from \$8,640 in 1963¹ to \$19,276 in 1970, an increase of 123%, or a 12% annual compound rate of increase. The effect of mortgage debt on the farm business was envisaged to be considerable, and the study attempted to assess the role, use of and problems relating to term finance.

4.2 Characteristics of Mortgage Debt Holders

The majority of farm businesses owed some mortgage debt as at June 1970 (Table 4.1).

Table 4.1

Proportion of Farm Businesses Owning Mortgage
Debt (%)

	<u>Sample</u>	<u>Population (95% Confidence range)</u>
As at June 1970	83	81-86
Ever	93	91-94

¹ Estimate by Miller, J.G., A Survey of Farm Credit in New Zealand, Dept. of Agriculture: Wellington, 1964: p. 30.

From this table, only 7% of respondents indicated that their businesses had always been financed from equity. Such respondents were in a significantly stronger relative liquidity position. Of respondents in the fourth liquidity quartile 18% had always financed their businesses from equity,

compared with only 1% in the first quartile. Total absence of debt was also a feature of older farmers over 60 years of age. Pride or faulty memory may therefore have influenced the result.

Age of operator (and therefore farming experience) was a significant factor related to presence and volume of debt as at June 1970 (Table 4.2).

Table 4.2

Presence and Average Volume of Mortgage Debt,
Classified According to Age Group of Operator

<u>Age Group</u>	<u>% Owning Debt</u>	<u>Ave debt volume (\$)</u> <u>(of farmers with</u> <u>debt)</u>	<u>No. of</u> <u>Observations</u>
21-30	93	26,612	27
31-40	92	27,221	85
41-50	87	25,666	100
51-60	82	16,530	75
Over 61	44	11,285	17
All farmers ²	83	24,247	305

Farmers with a current mortgage debt load in their businesses appeared to make more extensive use of extension facilities and budgeting techniques (Table 4.3).

² Includes in addition one operator less than 20 years of age.

Table 4.3

Use of Extension Services and Budgeting
Techniques Related to Debt Presence

	<u>With Debt (%)</u>	<u>Without Debt (%)</u>
Discussion group membership	34	10
Use of advisory services	42	25
<u>Budgeting -</u>		
With advisors	16	3
On own	36	17
Does not budget	48	80
Sample size (Nos).	305	63

There were also significant relationships between equity and liquidity quartiles and debt volume (Table 4.4). The equity relationship was, by definition, anticipated.

Table 4.4

Percentage of Respondents in Each Quartile Class
Owing Mortgage Debt, and Average Debt Owning
(30th June 1970)

	<u>Quartile</u>	1	2	3	4
<u>Equity</u>	% owing debt	95 ³	99	97	41
	\$ volume	36,953 ³	26,748	11,885	1,517
<u>Liquidity</u>	% owing debt	98	92	85	57
	\$ volume	28,230	24,318	16,448	8,108

These results therefore suggest that the incidence of mortgage debt is on the younger farm operator who has limited

³ Percentage lower than anticipated, as a result of several large private unsecured loans and/or overdrafts with banks and stock firms.

farming experience, but who has a greater appreciation and use of extension facilities and management techniques. In addition these farmers are in a weaker relative liquidity position. These results are consistent with the "life cycle" approach to farm business structural observation.

4.3 The Debt Stock

In this section the characteristics of the mortgage debt stock are discussed. A detailed breakdown is made partly for completeness and partly for future reference and comparison purposes. This stock analysis has not previously been carried out on New Zealand farm mortgage data.

4.3.1 Number of Mortgages

Mortgage details were recorded by interviewers according to the chronological order in which they were raised and provision for three entries was made on the questionnaire form. In a small number of cases more than three mortgages were secured against business assets and in one case seven mortgages were recorded. In these cases the entire post-second mortgage debt was attributed to the major source of this debt. Of respondents with a current mortgage debt load, 57% had one mortgage, 30% had two mortgages and 13% had three or more mortgages secured against their businesses. The distribution of mortgage numbers was significantly related to age of operator (Table 4.5).

Table 4.5

Distribution of Mortgage Numbers According
To Age Groups
 (% of respondents in each age group)

<u>No. of Mortgages</u>	<u>Age Group</u>				
	<u>21-30</u>	<u>31-40</u>	<u>41-50</u>	<u>51-60</u>	<u>61-</u>
One	37	46	58	75	71
Two	48	38	29	17	23
Three or more	15	16	13	8	6
No. of sample	27	85	101	75	17

This table confirms that the incidence of mortgage debt, by number of recorded deeds, is very much on the younger operator.

An increase in mortgage debt by number was associated with an increase in average business size and a decrease in average equity and liquidity (Table 4.6).

Table 4.6

Selected Business Parameters Classified
According to Number of Mortgage Deeds

<u>Parameters (Average)</u>	<u>No. of Deeds</u>		
	<u>One</u>	<u>Two</u>	<u>Three</u>
Business Valuation (\$)	90,125	92,322	116,622
Equity (%)	63.9	49.0	45.2
Liquidity Ratio	1.2/1	1/0.8	1/0.8
Mortgage Debt (\$)	22,998	35,061	47,570
Gross Sales (\$)	17,557	19,407	28,183
Net Profit (\$)	4,224	4,017	4,993
Business Drawings (\$)	2,993	2,876	3,239
No. of respondents	176	91	38

The valuation and gross sales volume was not significantly different between one and two mortgage businesses, but was significantly different between one and three mortgage businesses.

It appeared that farmers with a two mortgage business had lost the advantages of a relatively strong equity and liquidity without gaining compensating advantages of control over increased assets and sales generation.

4.3.2 Sources of Mortgage Finance

An analysis of the sources of mortgage finance (Table 4.7) highlights:-

- (i) The role of private individuals as the major source by volume;
- (ii) The role of the State Advances Corporation as the major source by number;
- (iii) The role of insurance companies in providing first as opposed to subsequent mortgages.

Table 4.7

Distribution of Mortgage Numbers and Volume
By Source
 (% of Total)

	<u>Number</u>				<u>Volume</u>
	<u>1st</u>	<u>2nd</u>	<u>3rd</u>	<u>ALL</u>	<u>ALL</u>
State Advances Corporation	36	31	26	34	28
Solicitors	9	1	7	7	8
Insurance Cos.	13	7	2	11	9
Private Individuals	21	45	38	29	38
Trading Banks/Trustee Banks	10	5	7	9	7
Other	11	11	22	12	10
	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>
Nos.	305	129	38	472	\$7.1m.

4.3.3 Purposes of Mortgage Borrowing

An indication was sought in interview as to the purpose of mortgage finance (Table 4.8). In cases where a mortgage was raised for a variety of purposes the major purpose was recorded.

Table 4.8

Purposes of Mortgage Numbers and Volume
 (% of Total)

	<u>Number</u>				<u>Volume</u>
	<u>1st</u>	<u>2nd</u>	<u>3rd</u>	<u>ALL</u>	<u>ALL</u>
Purchase of Land	78	57	55	70	73
Refinance	11	2	3	8	9
Development	4	29	19	12	10
Other (e.g. livestock, house)	7	12	23	10	8
	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>
Nos.	305	129	38	472	\$7.1m.

Whilst the table does show that the prime purpose of mortgage finance is for land purchase, it also shows that land purchase is a relatively less important purpose of second and third mortgages. The relatively more important purposes, particularly for development, were a feature of the mortgages of older operators who tended to be in stronger financial positions.

This conclusion is supported by study of the purposes of first and second mortgage, related to age group of operator (Table 4.9). Evidence revealed in this table does have policy implications for future discussion (Chapter 16). In particular it may be desirable from the national viewpoint for development to be carried out by younger farmers. This table does show that their first and second mortgage debt has resulted primarily from the necessity of land ownership.

Table 4.9(a)

<u>Stated Purpose of First Mortgage Finance</u> <u>Classified According to Age Group of Operator</u> <u>(% of respondents within age group)</u>						
	<u>21-30</u>	<u>31-40</u>	<u>41-50</u>	<u>51-60</u>	<u>61-</u>	<u>ALL</u>
Purchase of						
Land	85	86	75	75	71	78
Refinance	7	7	13	16	6	11
Development	-	4	5	5	12	4
Other	7	8	8	7	12	7
	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>
Nos.	27	85	101	75	17	305

Table 4.9(b)

<u>Stated Purpose of Second Mortgage Finance</u> <u>Classified According to Age Group of</u> <u>Operator</u> (% of respondents within age group)						
	<u>21-30</u>	<u>31-40</u>	<u>41-50</u>	<u>51-60</u>	<u>61-</u>	<u>ALL</u>
Purchase of						
Land	73	61	52	57	40	57
Refinance	4	2	2	-	-	2
Development	19	24	27	38	60	29
Other	<u>4</u>	<u>13</u>	<u>18</u>	<u>5</u>	<u>-</u>	<u>12</u>
	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>
Nos.	17	46	42	19	5	129

4.3.4 Security Requirements

81% of all mortgages were secured by land only.

In the 19% of cases where additional security was required this was in the form of stock and plant or personal assets, particularly life assurance policies. At the outset it was envisaged that life assurance cover would be a particular feature of insurance company lending to agriculture. Despite probing, holders of only 9% of insurance company mortgages were specifically asked by their company for any additional non-land security. This compares with 27% of holders of a solicitor's mortgage, and 32% of holders of a State Advances Corporation mortgage.

There was evidence to suggest that mortgagors in lower equity quartiles were more likely to have been asked for additional security, but this hypothesis was only significant at the 10% level. The conclusion is

that land remains the major security for mortgage finance.

4.3.5 Mortgage Type

Of all mortgages recorded 38% were flat. The type of mortgage was related to the particular nature of the lending policies of its source.

Table 4.10 shows for first mortgage data the reliance of institutional lenders on the table mortgage system, and the reliance of private lenders on the flat mortgage system. It was envisaged that those farmers with table mortgages might be facing a continuous principal repayment problem, and those with a flat mortgage the problem of ultimate repayment or refinance. However this "mortgage type" parameter was not a significant variable in any subsequent analysis.

Table 4.10

	<u>Percentage of First Mortgage, Security Classified According to Type and Source</u>					
	<u>State Adv. Corpn.</u>	<u>Solicitor</u>	<u>Insurance Company</u>	<u>Private Indiv.</u>	<u>Other</u>	<u>ALL</u>
Flat	2	85	20	87	17	33
Table	<u>98</u>	<u>15</u>	<u>80</u>	<u>13</u>	<u>83</u>	<u>67</u>
	100	100	100	100	100	100
No. of Mortgages	109	27	41	64	64	305

4.3.6 Interest Rates

The average rate of interest on all mortgages was 5.57%, and the standard deviation 1.11%. (Table 4.11). It was hypothesised that as a result of the upward drift in rural mortgage interest rates (Fig. 13.2) the rate structure of mortgages of older farmers would be significantly different from that of younger farmers. This hypothesis was not supported by the evidence. Neither was there a significant difference in aggregate, in the structure of rates classified according to the chronological order in which mortgages were raised.

Table 4.11

Interest Rate Structure of the Mortgages
Registered (472 mortgages)

<u>Rate (%)</u>	<u>%</u>	
Under 4	9	
4 $\frac{1}{8}$ - 5	20	Mean 5.57%
5 $\frac{1}{8}$ - 6	29	S.D. 1.11%
6 $\frac{1}{8}$ - 7	31	
Over 7 $\frac{1}{8}$	10	
Not Available	<u>1</u>	
	<u>100</u>	

The interest rate structure was related to mortgage source (Table 4.12). Results in the table do reflect the influence of the State Advances Corporation's post-war rehabilitation loan scheme, which offered concessional interest rate loans to returned servicemen.

Table 4.12

Interest Rate Structure of Selected
Mortgage Sources(% of all mortgages of
each source)

Rate (%)	S.A.C.	Solicitor	Insurance Company	Private Indivs.	Banks
Under 4	16	13	5	10	-
4 $\frac{1}{8}$ - 5	25	13	10	25	11
5 $\frac{1}{8}$ - 6	49	13	25	15	31
6 $\frac{1}{8}$ - 7	10	42	50	40	48
Over 7 $\frac{1}{8}$	-	19	10	10	10
	100	100	100	100	100
Mean rate (%)	5.20	5.92	6.11	5.75	6.18
Standard deviation	0.81	1.33	0.98	1.21	0.80
No. of Mortgages	161	32	52	116	40

The table shows average figures which do not reflect the current costs of borrowing. On the other hand data in 4.3.6 shows that the average cost of mortgage borrowing has not been high relative to borrowing costs of other sectors in the economy.

4.3.7 Term Structure of Mortgages

The average mortgage term was 17.61 years (standard deviation 10.05 years) and was raised 9.06 years (standard deviation 5.91 years) before June 1970. These figures confirm that there are wide variations of mortgage term in the finance of New Zealand agriculture.

Terms were related to some extent to purpose (4.3.3), but also to the lending policies of their source (Table 4.13).

Table 4.13

The Term Structure of all Mortgages of
Four Selected Sources

<u>Term (Years)</u>	<u>S.A.C.</u>	<u>Solicitor</u>	<u>Insurance Companies</u>	<u>Private Indivs.</u>
5 years and under	10	60	14	37
6 - 15	15	5	14	14
16 - 25	39	12	50	25
26 and over (generally not more than 30)	36	23	22	24
Mean	20.87	12.89	19.02	15.61
Standard deviation	8.49	10.63	8.10	10.12
Coefficient of variation	0.41	0.83	0.43	0.65
No. of Mortgages	161	32	52	116

Whilst term variability was a feature of all selected sources, the table does indicate the overall short-term nature of solicitors' mortgage lending to agriculture. The relatively long-term nature of State Advances Corporation and insurance company lending is also apparent. One-quarter of all mortgages recorded were for a term of five years or less, and approximately one half⁴ had been raised not more than five years before June 1970. A large proportion of the sample would therefore have had recent experience in dealing with a source of mortgage finance.

⁴ This figure includes refinanced mortgages.

A brief survey of the features of the mortgage debt stock of sample farm businesses has been presented. These features were related basically to the peculiar nature of the source, rather than to observable farm business parameters. However as the presence and extent of debt were related to age of operator, the data does tend to support the ownership utility concept (2.8).

4.4 Reasons for Borrowing

To gain some insight into farmer motivation the question was phrased,

"Can you say why you borrowed when you did?"

The difficulty of identifying such motivation was apparent and interviewers reported that many imprecise and "obvious" answers were given. The level of spontaneous answer was high and though the showcard technique (described in Appendix C) was used it did not stimulate response significantly. Responses were analysed according to chronological order in which each mortgage was raised (Table 4.14). This was because in many cases the purposes of second and subsequent mortgage finance (4.3.3) reflected strategic growth considerations (2.9).

Table 4.14

Reasons for Borrowing Mortgage Finance¹
(% of Respondents with Each Mortgage Group)

	<u>1st Mortgage</u>		<u>2nd Mortgage</u>		<u>3rd Mortgage</u>	
	<u>Spon.</u> ²	<u>ASC</u> ³	<u>Spon.</u>	<u>ASC</u>	<u>Spon.</u>	<u>ASC</u>
Farm/land available	72	79	49	55	33	36
Favourable interest rates	2	8	1	4	5	10
Sufficient deposit	5	15	2	10	0	7
Expected farming to be prosperous in future	6	17	10	17	5	10
At right age to borrow	7	17	8	16	2	7
Wanted to expand business	19	30	40	53	60	69
Other answers	16	-	15	-	12	-
No. of respondents	305		129		38	

Notes 1. Multiple reasons are included in this and subsequent tables.

2. Spontaneous answer.

3. After showcard (prompted) answer.

The data supported this growth hypothesis and showed that the desire for business expansion was an explanatory factor in the raising of subsequent mortgage finance. Since land availability was the prime stimulant of first mortgage borrowing, the results confirm the previous observation that the major purpose of first mortgage finance was for land purchase (Table 4.8).

The direct influence of interest rates as a stimulant to borrowing was observed to be low. In relation to the land availability factor and the traditional need for some equity to

enter farming this influence might be expected to be small. In any case the response that "interest rates were favourable" can probably be interpreted as an ex-post observation rather than as a true explanatory factor. The response was limited to older operators (over 40 years of age). These would have been accustomed to paying lower historical rates than at present, and many would have been eligible to take advantage of the post-war concessionary rates offered by Government.

There was limited evidence from these results to suggest that farmers borrowed directly in anticipation of future returns (i.e. "expected farming to be prosperous"). This factor which would be of critical import given economic objectivity, was of secondary importance in relation to land availability and the expansion desire. This response, particularly relating to first mortgage borrowing, was a feature of middle-aged operators. The initial borrowing of such operators would have been made post-war and in the early 1950's, when the economic climate of agriculture was relatively more favourable. Only 5% of respondents under 30 years of age who had borrowed on first mortgage finance mentioned this factor. It may be that anticipated future profitability is taken as "given" by the farming community and is not a direct influence on current borrowing decisions. Even so if this were true the prompted response in Table 4.14 might be expected to be higher. The conclusion is that the direct profitability motive (i.e. discounted future returns) is of secondary importance as an explanatory factor influencing borrowing decisions.

Detailed investigation in the conduct of the Pilot Survey⁵ suggested that some farmers believed that there was a "right" age to borrow. This nebulous concept was derived from the need in farmers' minds to balance business expansion with business security. It was revealed as a "right" time and age to borrow, a "right" time to consolidate and was consistent with discussed goals of ownership (2.8) and growth (2.9). The factor was therefore included in the final questionnaire but was shown not to be of major importance.

The desire to "expand the business" was a major observed explanatory factor in borrowing. For second mortgage data, positive response was significantly related to age of operator. Of such borrowers, 19% in the under 30 age group gave this reason, compared with 61% in the 41 - 50 group, 76% in the 51 - 60 group and 80% in the over 60 group. These observations further suggest that business expansion and development is a feature of middle aged operators.

This introductory study suggests that land availability is the major influence on first mortgage borrowing. Subsequently the desire for growth assumes increasing importance. Economic theory assumes that the land factor of production is available at some price, but that the decision to borrow would be made on the basis of discounted profitability. Whilst the implication is that economic motives do not govern borrowing, it may be that there is some identification problem.

⁵ Stanbridge, R.J., Report on Pilot Survey (Oxford County), Lincoln College, July 1970 (mimeographed) - internal circulation only.

These results suggest that considerably more research is needed into the motivations governing term borrowing by farmers.

4.5 The Search for Term Finance

An attempt was made to discover the extent of the search problem and factors affecting final choice of finance source. For each mortgage raised the question was phrased:

"Did you try to borrow money from any other sources apart from ...?"

IF YES:

"Why did you eventually borrow from the source you did?"

IF NO:

"Why did you borrow from the source you did?"

Responses to both sets of follow-up questions were recorded on the same pre-coded schedule. A showcard could have satisfactorily been utilised but the Pilot Survey indicated that the full effectiveness of this device was reduced with over-use.

The average search experience does not suggest that there is extensive "shopping around" for finance. There was a relationship between search and age of operator (Table 4.15). For first mortgage finance this was highly significant, suggesting that younger farmers were far more likely to have experienced the search problem than older ones. Measurement of possible memory lapses of older farmers has not been attempted and the conclusions should be interpreted with care.

Table 4.15

Percentage of Farmers Who Had to Approach
More than One Source for Term Finance
Classified According to Age Group

	<u>Age</u>					
	<u>21-30</u>	<u>31-40</u>	<u>41-50</u>	<u>51-60</u>	<u>61-</u>	<u>ALL</u>
1st Mortgage	56	28	24	20	12	25
2nd Mortgage	6	15	20	24	-	16
3rd Mortgage	-	29	20	29	-	21

A significantly higher number of respondents who ultimately borrowed on vendor mortgage indicated that they had first tried to borrow from other sources. There were no significant relationships between other parameters and experience of the search problem.

4.6 The Reasons for Finance Source Choice

A major practical problem was that many farmers found difficulty in explaining these reasons. Reasons given were closely related to the features of sources themselves. (Table 4.16).

Table 4.16

Reasons for Borrowing From Selected Sources
(% of all mortgages borrowed from that source)

<u>Reason</u>	<u>SAC</u>	<u>Solicitor</u>	<u>Insurance Company</u>	<u>Private Indivs.</u>	<u>ALL</u>
Not enough security for other sources	6	21	10	10	9
Low interest rates	63	3	10	26	30
Favourable terms	42	24	20	26	31
"Good reputation" of source	26	15	16	10	15
Money readily available	43	57	50	45	50
Mortgage (Nos.)	161	32	52	116	472

The security or lack of security factor was not an important influence on choice for the whole sample. The rate of interest assumed far more importance and did prove to be a strong attraction of the State Advances Corporation. Since this institution offers finance at below market rates, (up to June 1971), it was not surprising that significantly more of its mortgage holders mentioned the factor. Significantly more respondents in the 41 - 60 age groups mentioned the interest factor. This result is possibly a reflection of lower historical rates that these farmers had

borrowed at rather than a measurement of the extent of the influence of rates on choice at that time.

"Favourable terms" were defined to include factors such as deposit and security requirements and term and type of mortgage. As an explanatory factor it assumed equal importance with "interest rates". No significant observations were made, but the versatility of State Advances Corporation lending was confirmed by the results.⁶

It was originally hypothesised that through diffusion of information in the farm sector, borrowers might want to approach financial sources that had a good reputation. This factor itself would be a composite reflection of a financial sources' attributes. It was relevant to the State Advances Corporation, and the conclusion was that the Corporation does have a reputable standing amongst farmers. Results show that this imprecise "reputation" factor did not assume particular importance in the case of other financial sources.

The availability of funds was the major observed factor influencing the decision to borrow from a particular source. The detailed processes by which farm operators learn that loanable funds

⁶ For a full description of lending policies and their versatility see State Advances Corporation of New Zealand, Background Paper No. II (Policies), submitted to the Committee of Inquiry into Lending to Farmers, Wellington, September 1971.

are available particularly from institutional sources was not ascertained. The suggestion is that some "source probing" occurs before full application for finance. For private sources personal contact would be likely to play a major role.

The importance of availability as an explanatory factor can be related to the importance of the availability of land as an initial stimulus to borrowing (4.4). It can be argued that economic theory assumes all resources to be available at some price, but that directly observable factors (such as interest rates) will affect decisions. Results in 4.5 and 4.6 suggest that decisions are made primarily on "availability" grounds.

4.7 Relations with Sources of Term Finance

The search for finance has not been a major problem except for the younger farmer raising funds in recent years (4.5). To attempt to assess the magnitude of problems relating to the farm operator-mortgagee relationship the question was phrased:

"Do you have any criticisms of...
(your mortgage source) in your
dealings with them?" (Table 4.17).

Table 4.17

Criticisms of Mortgage Finance Source
 (% of total mortgage numbers - 472)

Slow/poor service	4
High security required	7
High interest rates	9
Not enough money lent	5
Institution interfered in running of business	2
Other criticisms	3
No criticisms	78

The table shows response levels after prompting. Response was not significantly increased by this use of the showcard and the major observation was that there are "no criticisms" in relationships with sources of 78% of mortgages outstanding. There was no significant difference in criticisms made of each finance source.

As holders of only 5% of the total mortgages outstanding indicated that "not enough money was lent" the result does not suggest that borrowers have found excessive difficulty in obtaining past requirements. High interest rates emerged as the predominant complaint but was mentioned by a small number of respondents overall. Interest rate criticism was restricted to respondents earning relatively low returns on their sales and assets who were also in a relatively weak equity position. Whilst there was a tendency for younger farmers in weaker equity and liquidity positions to make criticisms, no listed criticism was significantly related to any parameter used in analysis.

Though these results show that borrowers have few criticisms of finance sources two factors should be noted. Firstly, analysis has been restricted to those who have been successful in gaining entry to the farm sector. Different conclusions may have resulted from an investigation of circumstances of unsuccessful entrants. Secondly the study may have underestimated "real" criticism as:

- (a) the borrower is in a relatively weak bargaining position compared with the lender. Since "availability" has been shown to be an important factor influencing choice of institution (4.6) this may over-rule possible criticism.
- (b) through the effect of filters (2.2) and the limited bounded rationality concept (2.1) information to the borrower is likely to be restricted. He may therefore not be in a position to objectively criticise.

4.8 Future Demand for Term Finance

In his econometric study on United States data, Hesser⁽¹⁸⁷⁾ related the demand for mortgage funds in the farm sector to the volume of internal funds, the ruling interest rate, an index of expected prices, an index of farm technology, the farm wage rate, and the annual number of farm transfers. He concluded that the rate of interest and the volume of internal funds were of critical importance as demand factors.

A survey approach to determining these factors is likely to emphasise qualitative and motivational factors as opposed to measurable economic parameters. A major disadvantage of this approach is that conclusions are drawn from a study of the behaviour of sector members at any instant of time. An econometric approach would be more comprehensive but would lack direct motivational content.

All farmers in the sample were asked:

"Do you think that it is at all likely that you will be borrowing (long-term) mortgage money in the foreseeable future?"
(Table 4.18).

Replies were analysed on an "attitude scale" and the mean equity and modal age group of operator relating to each classification observed.

Table 4.18

Considered Likelihood of Borrowing Term Finance
In The Foreseeable Future
 (Sample Size - 368)

<u>Classified Response</u>	<u>% of Respondents</u>	<u>Mean Equity (%)</u>	<u>Modal Age Group</u> ¹
Very likely	10	48	31 - 40
Likely	11	60	21 - 30
Possibly	13	63	31 - 40
Unlikely	19	66	41 - 50
Very unlikely	47	77	61 -
	100		

Note: 1. Of operators making response.

Whilst data is based on ex-ante observation (which may not necessarily be reconcilable with ex-post fact), the table does give some indication from where future demand will originate. ^{from other information, not presented here} 52% of respondents in the 21-30 age group considered it at least a possibility that they will borrow term finance in the future, only 5% of respondents over 60 considered the possibility. Similarly 54% of respondents in the first equity quartile had considered the possibility of future borrowing compared with only 14% in the fourth quartile. Of the 63 respondents with no mortgage debt on their properties at June 1970, 85% indicated that it would be at least "unlikely" for them to borrow in the foreseeable future. There was no significant relationship between farm type and considered propensity for future borrowing.

4.9 Reasons for Not Borrowing

The reasons given by two-thirds of the sample for not borrowing are presented in Table 4.19.

Table 4.19

Spontaneous Reasons for Not Borrowing on a Term
Basis in the Foreseeable Future
 (% of Respondents - 242)

Too old	31
Satisfied with present size/development of farm	57
Don't like being in debt	12
Interest rates high	3
Pessimistic about future of farming	19
Can't borrow any more	4
Other answers	7
Don't know	3

Actual age of respondents was significantly related with the response "too old" for future borrowing. No farmer between the ages of 21 and 30 answered in this way but three-quarters of farmers over 60 indicated that age was an explanatory factor. Distribution of this response was also significantly related to equity and liquidity quartile. Since the relationship between age of operator and equity and financial strength has already been observed (3.10) this observation is consistent with the life cycle thesis of a changing goal structure. In particular these observations support the hypothesis of the ownership utility function (2.8).

"Satisfaction" with the status quo was the modal response. It suggested that there was a state where neither

the growth or the ownership goal was completely dominant but where operators no longer found it necessary to expand their business through borrowing. Middle aged respondents (between 31 and 50) were significantly more likely to have mentioned this factor than other groups. This was not surprising as younger farmers have been shown to have a greater prospective propensity to borrow and the age of older farmers was the major restriction on future borrowing.

A number of respondents specifically mentioned an aversion to debt. This response was thought to be indicative of a dominant ownership goal but no parameters were significantly related to its distribution. Since response was low, the conclusion is tentatively drawn that aversion to debt as such is not a major factor restricting the future propensity to borrow in toto. It may limit the magnitude of future borrowing, but this was not examined.

The effect of interest rates on future borrowing plans was observed to be small and only 3% of the sub-sample mentioned interest. Similarly, only a small number of respondents had reached their external credit limits and "could not borrow any more". This low overall proportion further suggested that term finance restrictions have not been a major impediment to the growth and structure of farm businesses in aggregate. The response was restricted to younger operators who were also in relatively weaker equity and liquidity positions. Whilst therefore the overall conclusion is valid:

- (i) There is a small fringe of unsatisfied borrowers;
- (ii) These borrowers did know that they had reached the limits of external rationing. Other prospective borrowers may not have approached sources for additional finance. The real extent of this restriction may not be apparent from this data.

Pessimism of the future state of the industry was an influence in 19% of decisions not to incur additional term debt. Significantly more sheep farmers than dairy farmers mentioned the factor. From comments recorded by interviewers this was attributable to the falling price of wool and resultant insecurity. The business expression of this insecurity might be the consolidation of capital gearing in favour of equity funds in order to maximise ownership utility. The feeling of pessimism was not related to age of operator. For instance, 17% of non-borrowers under 30 years of age gave this reason compared with 13% over 60. The latter observation is less relevant as these older operators are likely to be terminating their farming careers sooner. To the extent that lack of confidence (either real or imagined) is felt by the younger farmer, the theoretical progression of the changing goal structure will be distorted. Ownership rather than growth will be the dominant goal and at an earlier age. This distortion may have national implications in that:

(i) Output will be restricted;

(ii) Young men who cannot attain the ownership goal rapidly will not be attracted to the industry.

4.10 Search for Future Finance

A number of farmers were negotiating for additional term finance at the date of interview and one-third of all sample respondents indicated that it was at least possible that they would be borrowing in the foreseeable future (Table 4.18). An attempt was therefore made to determine the likely sources of finance which this sub-sample would approach and motivations for these choices. Fifty-one per cent of prospective borrowers suggested that in the first instance they would approach (one of) their current mortgage source(s) and as a result, initial search would be limited for over half of the prospective borrowers. Significantly more dairy farmers (66% of future borrowers) than sheep farmers (39% of future borrowers) made this comment. This difference is likely to be attributable in part to the more extensive use of "once only" private and vendor finance in the sheep farming industry.

Detail was sought on the reasons behind the decision of 49% of the prospective borrowers who would not be re-approaching their present sources. The question was phrased:

"Can you say why you don't think you would be borrowing money on a long term basis again from...?" (Table 4.20).

Results are expressed as a percentage of the 102 mortgages outstanding from sources that would not be re-approached.

Table 4.20

Spontaneous Reasons for Not Borrowing
in Future From Present Source(s)

"Once only" source	45
Other sources more appropriate to needs	19
High interest rates	15
Unfavourable terms	6
Not enough lent previously	1
Slow/poor service	1
Other answers	12

As envisaged, a high proportion of sheep farmers at present utilising "once only" sources indicated that they would be forced to search for future funds elsewhere. There were no other significant relationships between stated reasons and analytical parameters used but the small number of observations would have prohibited valid statistical analysis. The conclusions to be drawn from Table 4.20 are that:

- (i) The whole complex of "unfavourable" lending terms are not major factors influencing farmers to institute a search for new sources of finance. The observation has been made (4.7) that farmers on the whole have few problems in dealing with mortgage sources:
- (ii) A search largely results from the effects of the "once only" concept, and to a lesser extent the need for special non-purchase finance (e.g. for development) provided by only a few sources.

As a simple exercise in information awareness potential borrowers were asked to indicate the sources that they would approach and that they knew lent to farmers on a term basis. The approach was made in two ways:

- (i) For farmers contemplating an approach to a current finance source, the question was asked:
"What other sources lend mortgage finance to farmers?"
- (ii) For farmers not contemplating an approach to a current finance source the question was asked
"What sources lend mortgage finance to farmers?"

Results are not presented in detail but show that:

- (a) of the 64 farmers contemplating re-approach, awareness of other sources of finance was low. Nineteen per cent of these respondents knew of no other sources apart from their present ones;
- (b) of the 62 farmers contemplating approach to new sources, the State Advances Corporation (by 71%) and insurance companies (38%) were most frequently quoted;
- (c) interviewers reported that as a group farmers were not aware of available financial facilities. There may be a need for education but this ex-post observation was not pursued in detail in the questionnaire.

4.11 Reasons for Future Finance Source Choice

To attempt to discover the motivation behind the choice of future finance source the question was phrased:

"Can you say why you would try to borrow money from this source(s) in the future?"
(Table 4.21).

Table 4.21

Spontaneous Factors Influencing
Choice of Finance Source for Future Borrowers
 (% of respondents 126)

Money available	43
Low interest rates	43
Favourable terms	39
Good reputation	15
Good service/financial advice	19
Other answers	9
Don't know	1

These results support the validity of previous observations (4.6) that the major considerations influencing choice of long-term finance sources are interest rates, mortgage terms, and the availability factor. This latter factor assumed importance even though the majority of prospective borrowers had not "tested" the market. The interest rate factor assumed equal importance and was mentioned by significantly more prospective mortgagors of the State Advances Corporation than other sources. In the event, previous discussion has suggested that the interest rate factor is really only of secondary importance in relation to funds availability.

4.12 Summary

Whilst survey conclusions are only introductory they do provide a basis for future sociological, psychological and economic research in this field.

A description of the term debt structure has been presented and analysis made of the motivation of farmers in their past and future borrowing decisions. The factors influencing choice of both ex-post and ex-ante finance sources are similar. Funds availability was the dominant demand factor. This presents an identification problem since availability is also a supply factor. This problem was encountered by Hesser⁽¹⁸⁷⁾ in his econometric study.

Only one-third of the sample were even contemplating future term borrowing at the date of interview. This desire was a function of age of operator and his goal structure. The reasons for not borrowing were consistent with the thesis of the changing goal structure.

CHAPTER FIVE The Farm Credit Survey: Short-Term Credit
(Trading Banks)

In the United Kingdom the role of the trading banks as the short term financier of agriculture is almost complete. In New Zealand their role is less as a result of the development of an extensive stock farm sector, providing many similar facilities. Nevertheless the trading banks are an important source of finance and aspects of the role of the trading banks and bank credit in the farm business are both investigated.

5.1 Banks and Account Holders

Eighty-nine per cent of all farmers in the Survey operated a current account with a trading bank. The relationship with farm type (Table 5.1) does indicate the lesser role of the bank account in sheep compared with other types of farming. Such a hypothesis was tested and accepted as highly significant. The distribution of farmers with bank accounts was not biased on any regional basis. One exception was in Southland where only 67% of surveyed respondents operated an account with a trading bank. The strong local influence of the Southland Trustee Savings Bank providing a quasi-banking service for farmer customers

was the explanation for this phenomenon.

Table 5.1

Percentage of Respondents of Selected Farm Business
Types Operating a Bank Account

Principally dairy	99
Principally sheep	76
Sheep/beef	91
Sheep and cropping	81
Principally cropping	100
Market gardening	100

The distribution of farmer clients between the five trading banks conducting business in New Zealand highlights the importance of the Bank of New Zealand. (Table 5.2).

Table 5.2

Distribution of Farmer Customers
Between Banks
(% of farmers with an account - 329)

<u>Bank</u>	<u>%</u>
Bank of New Zealand	41
Australia and New Zealand Bank	22
National Bank of New Zealand	14
Bank of New South Wales	19
Commercial Bank of Australia	4
	<hr/>
	100
	<hr/>

Significantly more dairy farmers dealt with this bank than others. Study of other business and personal parameters did not reveal any significant differences between customers of the five banks.

5.2 Location of Branch

It was envisaged that branch location in relation to a respondent's business might have an effect on his familiarity with bank facilities and procedures. It was also envisaged that branches located in close proximity to their rural hinterland might evidence greater awareness of rural problems than city branches. The concepts of unsympathetic town, and sympathetic country branches were conceived.

From survey results 86% of respondents with an account kept it at the "nearest branch of any bank". Forty-one per cent of respondents indicated that their account was kept at a branch of less than 10 miles from their business base, 51% between 10 and 30 miles, and only 9% at a further distance.

Location variation is therefore not great. Since this factor was not a significant parameter in subsequent analysis the conclusion is drawn that the supposed town/country sympathetic/unsympathetic concept is a spurious one. Indeed, whilst the observation was not upheld by the Survey results, the Pilot Survey suggested that there was a trend amongst younger farmers to bank in large centres, primarily for social reasons.¹

¹ Stanbridge, R.J., op. cit., p. 7.

5.3 Reasons for Choice of Bank

Whilst this study is primarily concerned with credit, the availability of credit facilities was only one of a number of factors affecting a respondent's choice of bank. (Table 5.3).

Table 5.3

Factors Influencing Respondents
Choice of Bank
 (% of sample - 329)

	Spontaneous	After Show Card	Increase
Geographically convenient	10	24	14
Good service/advice	16	33	17
Family tradition	60	68	8
Advised to (e.g. by accountant)	10	18	8
Credit facilities	10	23	13
Personal reasons	13	19	6
Other reasons	7	-	-
Don't know	4	-	-

These reasons are self explanatory. Family tradition is shown to be the major determinant, suggesting that few farmers conduct a search for their optimum institution. Use of the show card has increased the response "good service/advice" significantly. However, show card listing may reflect ex-post satisfaction rather than act as a reminder of an ex-ante choice factor, i.e. respondents mentioning "good service" may be indicating that they are receiving such service. A significantly higher proportion of National Bank customers mentioned the service factor.

It is possible that the advertising campaign of this bank, based on "service", is the explanation, but no further data was available for investigation.

The age of respondent was related to stated choice factors. The hypotheses that both "good service" and "personal reasons" were more frequently quoted by older farmers (over 50) were tested and accepted at the 1% level. Two non-significant observations were that:

- (i) Younger farmers were more likely to have mentioned credit facilities as a choice factor;
- (ii) Where credit was cited "family tradition" was not.

Even though one quarter of the sample mentioned the factor, the role of credit facilities as an influence on bank choice is secondary. Since the trading banks offer broadly similar services and operate a number of cartel agreements (Chapter 11) it is unlikely that any one bank could offer significantly better facilities than any others. This conclusion is therefore not surprising.

5.4 The Importance of Bank Credit in the Farm Business

Even though credit facilities were not a major choice factor (5.3) it was envisaged that they would assume varying degrees of importance to farmers in the operations of their businesses. The question was phrased:

"You have mentioned/not mentioned credit facilities as one of the factors influencing your choice of bank. How important would you say bank credit facilities are in the conduct of your business?"

The attitude scale classification of response (Table 5.4) suggests that farmers consider these facilities either to be an important or a relatively unimportant element. There appeared to be little mid ground. A higher than expected proportion of farmers with bank accounts, 47%, indicated that bank credit facilities were relatively unimportant to them in their business operations.

Table 5.4

The Assessed Importance of Bank Credit
As A Factor in the Farm Business
 (% of Respondents - 329)

Very important	20
Important	19
Moderately important	14
Not very important	35
Of no importance whatsoever	<u>12</u>
	100

The attitude scale approach may be criticised conceptually as attempting to represent a response continuum on an arbitrary and mutually exclusive scale. Stated answers were closely related to objectively observable parameters (Table 5.5). Some confirmation is therefore available on the accuracy of subjective observation on the attitude scale. This is because:

- (i) There were significant differences between the value of farm businesses within "importance" rankings (F-test comparison of sub-sample means and variances). Larger businesses stated that they were and were more active absolute and relative users of bank credit;

Table 5.5

Mean Values of Selected Parameters
Classified According to Assessed Importance
of Bank Credit in Respondent's Businesses

<u>Parameters</u>	<u>Importance of Bank Credit</u>				
	<u>V. Imp.</u>	<u>Imp.</u>	<u>Mod. Imp.</u>	<u>Not V. Imp.</u>	<u>Of no Imp.</u>
Farm Business Assets (\$)	109,658	81,135	89,539	78,494	65,673
Equity (%)	62	63	67	72	72
Liquidity Ratio	2.5	3.7	4.3	7.1	12.5
Max. Bank Overdraft (\$)	4,887	3,441	3,359	1,012	546
Short term debt/ Farm assets (%)	6.3	6.6	5.1	3.6	1.9
No. of observations	67	62	47	114	39

- (ii) From (i), there were significant differences between maximum bank overdrafts within recorded classes;
- (iii) Despite the biasing effect of extreme observations, the liquidity ratio comparison indicated that increasing (relative) liquidity was associated with observed decreasing utility of bank overdraft facilities;
- (iv) Whilst not statistically valid, there was an observable relationship between equity of respondents and considered importance of overdraft facilities in their business;
- (v) There was a significant relationship between stated importance of bank credit facilities and stock firm credit facilities, for respondents dealing with both institutions. The conclusion follows that there is a core of farmers with large businesses to whom both bank and firm credit facilities are of extreme importance.

The parameter "importance of facilities" is used in subsequent analysis.

5.5 Transfer of Account (Ex-Post)

Some evidence of long run stability or instability in banking relationships was sought. In particular it was felt necessary to discover the extent to which farmers hampered by credit restrictions were prepared to transfer their accounts to another bank, in an attempt to try to alleviate the problem. The question was phrased -

"Have you ever banked with any other bank apart from...?"

Only 11% of respondents answered positively and there were too few observations to permit detailed statistical analysis. The reasons given for account transfer (Table 5.6) show that conflict between a farmer and his bank manager was a major contributory factor. Such conflict may also have been revealed in the answers "poor service" and "poor credit facilities" and a number of farmers gave multiple responses.

Table 5.6

Spontaneous Reasons for Transferring
Bank Account (in percentages)
 (sub-sample size - 38)

Personal conflict/reasons	32
Changed farm	30
Poor credit facilities	30
Poor service	19
Other	11

Of those who had transferred their business, 30% stated that credit played some part in the decision. A follow-up probe question was asked in an attempt to identify further the real role of credit as a transfer stimulant. The question was phrased:

"You have mentioned/not mentioned credit facilities as one of the factors influencing your decision to change banks. How important would you say this factor was?" (Table 5.7).

Table 5.7

The Importance of Credit as a
Factor Influencing Ex-Post Transfer
of Bank Account
 (% of respondents - 38)

Very important	35
Important	13
Moderately important	8
Not very important	30
Of no importance whatsoever	<u>14</u>
	<u>100</u>

Responses tended to be polarised towards the two attitude extremes and it appeared that inadequacy of credit facilities was a causal factor in slightly under a half of all transfers. There was some indication that:

- (i) Credit facilities were a more important explanatory factor for dairy than for sheep farmers;

- (ii) Respondents who mentioned "credit facilities" as an important transfer factor valued and used these facilities extensively with their present bank.

The overall conclusion is that whilst there is not evidence of widespread inter-bank transfer of business, inadequacy or supposed inadequacy of credit facilities was one of a number of causal factors, and was of critical importance in some cases.

5.6 Transfer of Account (Ex-Ante)

It was anticipated that at any one time there will be a dissatisfied fringe of bank customers who had not, but who had contemplated a transfer of account. Intra-farm community contact might be sufficient to induce such thoughts and a number of farmers mentioned having heard that "terms were better elsewhere". (Examination of this concept of information and opinion diffusion within the farming community would itself have been a worthwhile field of investigation). The question was phrased:

"Have you ever thought about banking with any other bank?"

Of the 31 farmers (9% of all respondents with an account) who had thought this way, personal conflict was

mentioned by 14, poor service by nine and the difficulties of arranging adequate credit facilities by only five. The mean equity of these five respondents was 20% at 30 June 1970, so it would be unlikely, *ceteris paribus*, that they would be able to obtain additional accommodation elsewhere.

The 31 dissatisfied respondents had a lower mean equity (57%), than the 298 respondents who had not contemplated such a transfer (68%). As nearly half of these dissatisfied respondents had already completed a transfer before (5.5), the conclusion is that there is a small dissatisfied fringe of bank users. Within this small group credit facilities are a factor inducing transfer, though are of secondary importance in relation to the personal conflict problem.

5.7 Uses Made of Trading Bank Services

Credit facilities are only one of the services offered by trading banks. To place in perspective the use made of credit facilities by the farm community, details were collected of their use made of all facilities (Table 5.8). The show card technique was used and it was apparent from interviewers' subsequent reports that many farmers were ignorant of services available.

Table 5.8

Uses Made of Bank Services
(% of Respondents - 329)

Cheque Services	99
(Credit facilities)	(65)
Safe custody	58
Savings/deposit account	46
Standing order payments	39
Travel arrangements	37
Financial/investment advice	15
Provision of economic/statistical information	3
Exporting/importing services	2

Since it is likely that all farmers with a current account use cheque facilities an observed error of 1% has occurred. This may be attributable to a reading oversight and is one of the disadvantages of the show card method of investigation.

A number of observations were significant. Older farmers were more frequently observed to be operating a savings account, a possible reflection of their liquidity (Table 3.7) and changing goal emphasis. In addition, they made more extensive use of safe custody facilities. Savings accounts were also a feature of dairy rather than sheep-type farming. This latter group have an observed closer relationship with stock firms (6.1), who themselves provide deposit facilities. Dairy farmers also made more use of standing order and safe custody facilities than sheep farmers. The hypothesis that lower equity farmers used standing order facilities more than higher equity respondents was accepted as highly significant. This observation was anticipated as lower equity farmers would be by definition more concerned with debt and

possibly instalment repayment.

5.8 Additional Services

Suggestions were invited as to additional services the trading banks might offer to farmers and 32% of respondents made some comment. (Table 5.9). Suggestions were a feature of respondents in weaker liquidity and equity positions (both hypotheses accepted at the 10% level), to whom careful financial management would be relatively more important.

Table 5.9

Suggestions for Improvements in
Trading Bank Services to Farmers
(% of respondents - 106)

Informality in customer relations	55
Agricultural training for bank staff	45
Marketing, management and financial advice	29
Lenient/flexible lending facilities	23
Reduced interest rates	16
Bookkeeping facilities	12
Local branch autonomy (in decisions)	10
Reduced bank manager turnover	6

Over half of those with suggestions were conscious of what they believed to be an over-formal banker - client relationship. Many made similar comments of the type "wish that the bank manager would come to the farm". The spontaneous answer was frequently made that "more agricultural

training" for bankers was needed, but in very few cases were respondents able to elucidate further. The real extent of this deficiency is therefore in doubt. A surprisingly high proportion of respondents felt that the banks should play a more active role in the management function of their business. Interviewers' reports suggested that the small number advocating "reduced interest rates" were at least nominal, and in some cases vocal adherents to Social Credit doctrines.

In conclusion, whilst suggestions that were made

A disadvantage of the survey method of analysis is that some respondents will suffer from time illusion. Caution must be exercised in interpretation of the result that 22% of farmers with bank accounts have never been in overdraft. It would probably be more correct to interpret this figure as the number of respondents without a business overdraft within say, the last decade. Even so, the conclusion that a large minority of farmers (35%) do not actively utilise credit facilities at present is still valid.

Age of operator and his equity (as measured on the equity quartile basis) were parameters significantly related to use of bank credit at the three intervals of time. Such relationships were not unexpected. There was also a relationship with farm type. Dairy farmers, mixed farmers and specialist farmers (such as market gardeners) were relatively more active users than sheep farmers who had greater recourse to stock farm facilities.

5.10 Maximum Use of Overdraft Facilities

An examination was made of the peak periods of dependence on bank credit. Such maximum usage was related primarily to type of farming (Table 5.11). For comparison the table also shows periods of maximum use of stock farm facilities. From column (vi), there were significant differences in periods of maximum demands. Stock farm

lending was concentrated during the spring and early summer, whereas bank lending was more evenly spread. These patterns reflect the seasonal operations of the types of businesses that these institutions are primarily financing.

The maximum demand on external funds by dairy farmers is through the winter months, whereas sheep farmers exhibit a later peak. Of those sheep farmers using stock firm funds in their businesses, 86% indicated that maximum use was in the fourth quarter of the year.

These results from survey data do correspond with published data on the seasonal flow of trading bank and stock firm lending to agriculture. (Appendix E).

5.11 Uses of Bank Overdraft

Whilst there are no official controls on bank lending to agriculture, there are restrictions limiting the extent of their lending activities in other fields. There are also explicit or implicit factors based on traditional banking canons, which restrict the uses for which funds are made available to farmers. Borrowers were asked whether they were aware of any of these factors and 89% replied positively. From limited information available, an estimated 70% had heard of restrictions from their bank manager, 22% through a newspaper and 8% from other sources. There was evidence to suggest that younger operators with lower equities were more aware.

Table 5.11

Peak Overdraft Periods of Selected Farm Types

	(i) Principally Dairy Farming	(ii) Principally Sheep Farming	(iii) Sheep/Beef Farming	(iv) Sheep and Cropping	(v) Market Gardening	(vi) All ¹
<u>Bank Overdraft</u>						
Jan-March	9	0	5	9	46	10
April-June	21	4	4	0	8	11
July-September	44	17	20	18	0	27
October-December	16	60	59	55	38	40
Don't know	10	19	12	18	8	12
Total	100	100	100	100	100	100
No. of Respondents	(68)	(53)	(56)	(11)	(13)	(257)
<u>Stock Firm Overdraft</u>						
Jan-March	5	0	7	0	*	5
April-June	23	0	7	8	*	6
July-September	41	9	27	17	*	21
October-December	27	86	57	67	*	62
Don't know	4	5	2	8	*	6
	100	100	100	100	*	100
No. of Respondents	(22)	(78)	(44)	(12)	(5)	(195)

* Insufficient observations available.

¹ Includes farm types not shown separately in columns (i) - (v).
Represents all respondents who have used facilities, and not restricted to current active users (5.9).

Bearing in mind this high awareness element, it was hypothesised that respondents would use their overdrafts in different ways according to their business structure, personal characteristics and farm type. Farmers who actively utilised bank credit in their businesses (i.e. within the last year) were asked to indicate the uses to which funds were put (Table 5.12). Only 3% of respondents spontaneously indicated that they did not know. The initial observation is the importance of bank funds as a source of seasonal finance and/or working capital.

After show card prompting, nearly 20% of borrowers deliberately "tried not to go into overdraft". The uses of facilities made by these farmers tended to be limited. The effect of the show card was to substantially increase the number of farmers who indicated that they borrowed for the payment of tax.

A lower equity was generally associated with borrowing for a wider range of purposes. Similarly, those rating credit facilities to be an important factor in their businesses (Table 5.4) were far more active users. Passive users (those to whom credit was not an important factor) tended to restrict their borrowings for seasonal and/or working capital purposes.

Table 5.12

Uses Made of Bank Overdraft Facilities
 (% of active users - 214)

<u>Purpose</u>	<u>Spontaneous</u>	<u>A.S.C.</u>	<u>Increase</u>
Seasonal finance	43	61	18
Working capital	41	65	24
Finance of development work	15	33	18
Purchase of plant and machinery	9	28	19
Tax payments	9	34	25
Stock purchase	15	36	21
Private purposes	12	28	16
To counter income changes	9	28	19
"Try not to go into overdraft"	12	20	9
Don't know	2	-	-

A comparison has been made between the uses made of bank and stock firm credit facilities (Table 5.13). There were no significant differences between numbers using funds for stated purposes, with the exception of stock purchase. This is likely to be a reflection of the dual role of the stock firm as both financier and supplier of livestock.

The stated uses of bank funds were in some cases significantly related to observable parameters and relationships are examined.

(i) Seasonal Finance

Such borrowing was envisaged to be a passive use of funds. Money would be typically borrowed for short periods and would be quickly repaid from receipts of produce sales. Despite prompting, respondents mentioning this use often did not mention others. They tended to be

in a relatively strong equity and liquidity position.

(ii) Working Capital²

Such borrowing was envisaged to be for farm trading expenses for longer periods than (i) above, but with the usual proviso that credit balance was attained at least once a year. There was a significant relationship (at the 5% level) between use and age of operator. A significant relationship (at the 1% level) was also observed between stated "importance" of credit (Table 5.4) and use. The conclusion was that young farmers who considered bank borrowing to be an important business tool were more likely to borrow for this purpose.

(ii) Finance of Development Work

Items classified as development work were taken from Johnson⁽¹¹⁴⁾. No significant relationships or trends were observed.

(iv) Purchase of Plant and Machinery

Such use of funds is self explanatory. The suggestion that lower equity respondents used facilities in this way was not significant. The "importance" of credit factor was significantly related to use at the 5% level.

² Some confusion arose in respondents' minds as to differences between (i) and (ii). Interviewers were instructed to explain differences in concept, but many still stated that they used facilities in both ways.

Table 5.13

Comparison Between Uses Made of Trading Bank and Stock Firm Overdraft
Facilities by Three Selected Farm Types
(% of Active Users - A.S.C. Response)

<u>All Farmers</u>		<u>Principally Dairy</u>		<u>Principally Sheep</u>		<u>Sheep/Beef</u>	
<u>Bank</u>	<u>Firm</u>	<u>Bank</u>	<u>Firm</u>	<u>Bank</u>	<u>Firm</u>	<u>Bank</u>	<u>Firm</u>
61	58	54	9	55	75	73	64
65	59	57	14	60	71	73	66
33	37	34	27	30	44	36	48
28	34	24	0	30	51	27	34
34	30	43	5	25	44	32	32
36	79	29	86	38	76	39	75
28	19	15	5	49	22	30	30
28	23	27	9	19	25	36	23
20	13	21	14	17	17	23	11
(214)	(171)	(66)	(22)	(51)	(76)	(54)	(42)
Seasonal finance		54		55		73	
Working capital		57		60		73	
Finance of development work		34		30		36	
Purchase of plant and machinery		24		30		27	
Tax payments		43		25		32	
Stock purchase		29		38		39	
Private purposes		15		49		30	
To counter income changes		27		19		36	
"Try not to go into overdraft"		21		17		23	
No. of respondents		(66)		(51)		(54)	

(v) Tax Payments

Relationships were observed between both equity quartile (significant at 1%) and age of operator (significant at 5%) and use. Younger farmers with lower equities were likely to use funds in this way. However the modal age group of users was the 41 - 50 class. Farmers in this group were observed to be earning higher mean net incomes than others, without having had time to accumulate relatively larger liquidity balances. (Table 3.7).

The "importance" of credit (Table 5.4) was significantly related to use at the 1% level, and dairy farmers were also observed to use bank credit in this way significantly more (hypothesis significant at 5%) than sheep farmers. (Table 5.13).

(vi) Stock Purchase

The trading banks are used relatively less than stock firms in the provision of such finance (Table 5.13). No other significant observations were made.

(vii) Private Purposes

The classification includes funds borrowed for off-farm activities such as family living expenses and motor vehicle purchase. The hypothesis that respondents earning lower rates of return on their farm assets were more

likely to borrow for this purpose was accepted at the 5% level. In some cases these farmers were earning low absolute incomes and borrowed funds might be needed to provide for living expenses.

From Table 5.13, only 15% of dairy type borrowers used facilities in this way, compared with 49% of sheep farmers. The difference was highly significant. It is explained as a result of the observed widespread practice of many sheep type farmers to conduct off-farm business through a bank account and on-farm business through a stock firm account. Dairy farmers have not got such ready access to alternative finance sources.

(viii) Finance to Counter Income Changes

Whilst macro-results suggested that changes in short-term debt were not inversely correlated with changes in income (1.4), it was envisaged that individual farmers may deliberately borrow as a cushion against the effects of falling income. Since 28% of respondents answered positively this process does occur at the micro-level, particularly amongst dairy farmers.

The use was significantly related (at the 1% level) to considered "importance" of credit facilities (Table 5.4). A relationship with profit/sales quartile was also significant (at the 5% level), and those earning lower rates were more likely to use facilities in this

way. Some farmers in the lower quartiles were earning low absolute incomes, and any fall would induce increased borrowing to maintain living standards.

(ix) "Try Not to Go Into Overdraft"

It was envisaged that there would be farmers who did use overdraft facilities, but not as a deliberate policy measure. A highly significant relationship was discovered between this response and equity quartile. The response was also a feature of older operators many of whom answered in this way spontaneously.

In conclusion, passive users of bank overdraft facilities ((i) and (ix)) were observed to be older operators and/or those with higher equities in their businesses. The more active uses were observed to be for working capital, plant and machinery purchase, tax payment and income buffer purposes. Such uses were related to considered importance of bank credit in the farm business (Table 5.4), which in turn was related to absolute dollar use of overdraft (Table 5.5). Some differences in uses made by farm type (Table 5.13) have been discussed and suggest that dairy farmers are more restricted in their sources of funds than sheep farmers.

5.12 Problems in Use of Bank Credit Facilities

It was hypothesised that problems would be experienced in the use of bank overdraft facilities. Direct use was made of the show card and respondents were asked:

"Have you come across any of these problems in your experience of borrowing money from the bank?" (Table 5.14).

Table 5.14

Problems Experienced by Users of
Bank Credit Facilities
 (% of Active Users - 214)

Credit expensive	14
High security required	13
Credit difficult/impossible to arrange	9
Rapid rate of repayment required	6
Banks excessively cautious in lending	17
Banks willing to provide only small loan	12
Interfere in running of business	2
Insufficient agricultural knowledge	19
None of problems experienced	61

Whilst the significant observation is the high proportion of the sample with "no problems", study of mean business parameters of respondents provides a useful framework for assessing the real validity of problems. (Table 5.15).

(i) Credit Expensive

These respondents were earning relatively low rates of return on their business assets. (Table 5.15). The margin between return and cost of borrowing would be relatively smaller than for other borrowers, with the result that such respondents might be more conscious of interest rate charges. Significant relationships were observed between the distribution of this response and profit/sales quartile (at the 1% level) and profit/assets quartile (at the 5% level).

The problem of expensive credit was mentioned particularly by older farmers, but the low level of aggregate response cannot support the view that interest is in the farmer's view, an excessive business burden.

(ii) High Security Required

There was a significant relationship (at the 5% level) between experience of this problem and equity quartile. From Table 5.15 the mean equity of such complainants was under 50% and their relative liquidity position was comparatively weak. These respondents would have little additional security to offer on further borrowing and as a result security margins might appear high.

Table 5.15

Average Business Parameters at June 30 1970 of Respondents Citing
Problems Experienced in Using
Bank Overdraft Facilities

No.	Problem	Equity (%)	Profit/ Sales (%)	Profit/ Assets (%)	CA/CL Ratio	Business Valuation (\$)	Maximum Bank Overdraft (\$)	Maximum Firm Overdraft (\$)	Short Term Debt % Assets	Business Drawings (\$)	No. of Respond- ents
1	Credit expensive	58	16	3.9	0.9	76,415	5,225	1,543	8.9	2,768	29
2	High security required	49	24	4.4	0.5	73,532	4,288	2,076	8.7	3,648	27
3	Credit difficult/ impossible to arrange	50	21	4.5	1.7	93,973	6,454	2,069	9.1	5,706	19
4	Rapid rate of repayment required	66	17	4.4	0.7	79,321	6,217	1,917	12.6	2,670	12
5	Excessively cautious in lending	60	21	5.3	0.8	76,548	4,493	1,110	7.3	3,824	36
6	Willing to provide only small loan	54	19	4.3	0.6	71,019	4,484	1,710	8.7	2,380	25
7	Interfere in running of business	46	38	8.3	1.0	58,216	3,644	750	7.5	3,452	4
8	Not sufficient agricultural knowledge	60	23	4.8	1.1	83,874	4,748	1,659	7.6	4,100	40
	None of problems experienced	67	29	6.6	1.5	82,546	2,541	1,667	5.1	3,039	131

Key: CA Current Assets
CL Current Liabilities.

(iii) Credit Difficult/Impossible to Arrange

Some indication of respondents' goals and motivations was available from interviewers' reports on each interview completed. Whilst only 7% of bank credit users experienced this problem, interviewers reported that this experience was a particular feature of progressive farmers. From Table 5.15, these operators had borrowed extensively to finance a relatively large business and to the extent that drawings are a reflection, enjoyed a comparatively high standard of living. They were extensive users of bank funds and were frequently operating at the overdraft margin. Interviewers' reports suggested that in a number of cases aspiration levels were on a higher plane than current business constraints would allow. The restriction of funds to this small aggressive minority, whilst in accordance with static security requirements has implications.

(iv) Rapid Rate of Repayment Required

There were no significant observations with selected parameters. Short term debt of these respondents was high in relation to business assets employed (Table 5.15). The desire of lending institutions to reduce their commitments to these businesses may therefore have induced this response.

(v) Other Problems

Whilst no parameter distribution was significantly related to experience of other problems sub-sample sizes were in some cases too small to allow statistical testing. The comment "excessively cautious" may be interpreted as a general observation rather than as a statement of a specific business problem. The same comment is applicable to the "agricultural knowledge" remark.

(vi) None of Problems Experienced

These respondents tended to be in a stronger equity and liquidity position than those with problems. (Table 5.15). They were also earning higher rates of return from their businesses. There was a significant relationship with considered "importance" of credit (Table 5.4) and such respondents tended to use bank credit to a lesser extent than those with problems.

5.13 The Role of Limits

A number of "problems" were examined in greater detail in the study. It was envisaged that a large number of farmers would be operating under an overdraft limit and that this limit if sufficiently restrictive, would be hampering the efficiency of their operations. Of the 214

users of bank credit, 76% indicated a specific limit to which their borrowing was constrained. There was no significant difference between the mean limit and mean "maximum borrowing" where no limit applied. (Table 5.16).

Table 5.16

Mean Limit/Maximum Borrowing
in Farm Businesses from Trading Banks
(y/e 30 June 1970)

		<u>No. of Resps.</u>	<u>% of Resps.</u>	<u>(\$)</u>
(i)	Limit	163	76	3,864
(ii)	"Maximum Borrowing"	51	24	4,004
(iii)	Mean borrowing (i) + (ii)	214	100	3,898

The range of overdraft limits was from \$400 to \$35,000 and the distribution was positively skewed. (Table 5.17).

Table 5.17

Distribution of Loan Limits by
Number and Volume

<u>Limit (\$)</u>	<u>No. (%)</u>	<u>Volume (%)</u>
Under 500	4.7	3.4
500 - 4,999	69.5	37.2
5,000 - 9,999	18.8	32.0
Over 10,000	<u>7.0</u>	<u>27.4</u>
	100	100
	163 respondents	\$0.630m.

There were highly significant relationships between presence of a limit and observable parameters. In particular:

- (i) Younger farmers were more likely to be operating under a limit than older farmers;
- (ii) Dairy farmers (83% of dairy type users of bank credit) were more likely to be operating under a limit than sheep farmers (63% of sheep type users of bank credit);
- (iii) Farmers earning lower return on sales were more likely to be operating under a limit (hypothesis significant at 5%). In some cases a lower return was a result of observed deficiencies of management. These may have been recognised by the bank manager as well as by the interviewer.

Of those 163 farmers operating under an overdraft limit 48% indicated that they had reached that limit during the year ending 30th June 1970. It was envisaged that there may be internal financial pressure on the business of these farmers, but that an upward adjustment of the limit might alleviate this strain. At the same time other farmers both voluntarily and involuntarily, would be reducing their limits. The questions were phrased:

"Has your overdraft limit changed at all in the last five years?"

"Have you always had your request for a change in overdraft limit granted?"

Interviewers were instructed to record the circumstances of cases where the second question was answered in the negative.

Of farmers currently operating under a limit, 48% had increased their limit during the past five years, 16% had decreased their limit, and 36% indicated that there had been no change (or did not know). Response distribution showed that limit reduction was a feature of older operators. Significantly more sheep than dairy farmers had increased their limits, suggesting that sheep farmers are increasingly active users of bank funds relative to dairy farmers.

These results, together with the observation that 82% (± 2.67) of respondents operating under a limit "always" had their request for limit adjustment granted, do not support the thesis that the farm sector is struggling for bank finance. The latter result may have been biased upwards as a result of personal pride and the desire of interviewees not to appear as "rejects". Even so, the restricting influence of overdraft limits on farm business behaviour appears to have been small for the majority of farmers.

Study of parameters of the small sample who had been refused a limit adjustment showed that the mean equity was 58% and lower than those who had always had adjustment. The modal explanation for refusal was "lack of security". The mean equity of these respondents was under 40%. Even though farmers were

exempted, several cited the 1967 credit restrictions as the contributory factor. A small number mentioned that a refusal was a result of the proposed use of funds for non-agricultural purposes. These circumstances therefore do not suggest that the farm sector at large is suffering from an inflexibility of or banker resistance to limit adjustment.

5.14 Overdraft Reduction and Refusal

As a further attempt to assess restrictive effects on the farm business, all active users of bank borrowing were asked:

"Have you ever been asked to reduce your overdraft?"

The effect of respondent's limited time horizons is that "ever" will not be strictly interpreted. This distortion coupled with the influence of personal pride, will mean that the result is likely to be suspect. No attempt was made to adjust crude response to take these factors into account as it would be ^adifficult and time-consuming procedure.

Of active users of bank credit, 20% indicated that they had "ever" been asked to reduce their overdraft. There was a significant relationship between positive response and assessed importance of bank credit as a business tool

(Table 5.4). A significant relationship was observed with equity quartile (28% of users in quartile one, compared with 13% in quartile four) and respondents earning lower returns on their business assets were more likely to have been asked for an overdraft reduction.

The explanations given for this request (Table 5.18) do not suggest any discriminatory treatment towards farmers, given current banking practice. No farmer intimated that his business had suffered in the long term as a result of enforced overdraft reduction. As a causal factor the role of security was relevant both directly and indirectly, through the operation of the limit system.

Table 5.18

Reasons Given by Bankers for a Request for
Overdraft Reduction
 (% of sub-sample 43)

<u>Reason</u>	<u>%</u>	<u>Mean Equity</u>
1967 credit squeeze	43	65
Overdraft limit exceeded	41	56
Limited security	5	30
Other	11	74

Even fewer respondents, only 7% of active bank credit users, had ever been refused an overdraft. With this small sample further analysis was not possible. The use of funds for non-farm purposes and lack of security were offered as explanations. This small proportion is further evidence that farmers are not finding difficulty in obtaining bank credit for legitimate farm purposes.

5.15 Farmers Without a Bank Account

Discussion (5.1 - 5.14) has been limited to the behaviour of the 89% of all Survey respondents with a bank account. It was hypothesised (2.11) that the 11% of the aggregate sample without an account would anticipate dis-utility from the use of bank facilities. During their farming career, 4% of the total sample had operated and closed a bank account. In all cases these respondents:

- (i) Were sheep-type farmers, able to use stock firm financial facilities;
- (ii) Felt that their use of an account was too limited to justify its cost.

In only two cases, credit facilities were cited as a factor in the final closure decision. One respondent with a current equity of 30% stated that his bank manager "refused (him) money once... so (he) left". Credit difficulties are therefore not a factor influencing permanent closure of an account.

Of all survey respondents, 7% had never operated a bank account. All of these were sheep or sheep-type farmers. Respondents were vague in their answers to the question:

"Can you say why you have never opened a bank account?"

They "preferred the firm" and could see "no advantage" in operating a bank account. Over half of them considered that none of the listed bank services (Table 5.8) would be of any benefit in the conduct of their businesses. From verbatim responses, they all had close personal, financial and historical associations with a stock firm. It can therefore be concluded that the dis-utility of operating a bank account would be greater than any concomitant advantages.

5.16 Summary

The role and uses of bank credit in the farm business have been examined. The conclusions are that:

- (i) Credit facilities are not the major factor influencing farmers in their choice of bank (5.3) or in a transfer of account (5.5).
- (ii) Bank overdraft facilities are relatively more important to dairy farmers (5.9). The major uses of overdraft are for seasonal purposes and working capital (5.11).
- (iii) Farmers in general are not critical of trading banks. Only 22% ($\pm 1.5\%$) of all Survey respondents indicated that they had experienced "problems" in their borrowings (Table 5.19).

Problems were experienced by younger farmers with less security and the marginal experience of problems may therefore be greater than the average. Examination of business parameters (Table 5.15) suggests, given current banking practice, that the business situation of some of these farmers was a cause, rather than a result of their problems.

- (iv) The operation of the overdraft limit system (5.13) does not appear to have had major effects on the operations of the farm business. Adequate bank credit has been available to farmers (5.14), up to the date of the Survey.
- (v) On the whole, the banking sector has met the farm sector's legitimate requirements.

Table 5.19

Percentage of Sample Experiencing "Problems" in
Use of Bank Credit Facilities

		<u>%</u>	<u>Number</u>
(1)	Total Sample	100.0	368
(2)	<u>less</u> without a bank a/c.	<u>10.6</u>	<u>39</u>
(3)	Respondents with bank a/c.	89.4	329
(4)	<u>less</u> non-active users of o/d. facilities	<u>31.4</u>	<u>115</u>
(5)	Active users of overdraft facilities	58.0	214
(6)	<u>less</u> "none of problems experienced"	<u>35.6</u>	<u>131</u>
(7)	Problems experienced	22.4	81

CHAPTER SIXThe Farm Credit Survey -Short-Term Credit

(Stock and Station Agents)

Stock and Station Agent firms are traditional suppliers of services and requisites to the agricultural sector. Their trading activities have led them to develop an extensive quasi-banking system for their clients, such that their collective financial commitment to the farm sector now exceeds that of the trading banks, and their farm sector deposits are nearly three-quarters of the volume held by the trading banks.

6.1 Firms and Account Holders

Since the nature of stock firm business has historically evolved from meeting the needs of the sheep farmer, the observation that significantly more sheep and sheep-type farmers were running a trading account was not surprising (Table 6.1).

Table 6.1

Percentage of Respondents of Selected Farm Business Types
Operating a Stock Firm Account

Principally Dairy	56
Principally Sheep	90
Sheep/Beef	69
Sheep and Cropping	76
Principally Cropping	64
Market Gardening	40
All Farmers	72

More respondents (30% of those with accounts) held their account with Dalgety New Zealand Ltd. than with any other firm. NMA Ltd. held 20% of the accounts, and Wright Stephenson and Co. Ltd., 10%. The remainder were held with the 16 regional members of the New Zealand Stock and Station Agents Association. NMA Ltd. held the accounts of significantly more sheep farmers than other firms, and also those with larger businesses (F-test significant at 5%). There were no other significant differences between the parameters of respondents dealing with the various firms.

6.2 Functions of Stock Firms

To place the lending role of stock firms in context, the question was phrased:

"What do you consider to be the main function of your stock firm?" (Table 6.2).

Table 6.2

Main Functions of Stock Firms to Farmers (% of Respondents - 264*)

Livestock purchase/sales	81
Wool buyers	46
Suppliers of Farm Requisites	55
Provision of Farm Finance	35
Service/Advice	27
Other Answers	2

* Multiple spontaneous responses are included.

The number listing the finance function was relatively small and the financial services offered by stock firms still appear to be, in farmers' minds, secondary to the traditional servicing functions. The distribution of the finance response was:

- (i) Significantly related to the business liquidity of respondents. Whilst 52% in the first liquidity quartile mentioned "farm finance" only 21% in the fourth quartile mentioned this factor;
- (ii) A feature of sheep (45% of sheep farmers with an account) rather than dairy (4%) farmers.

6.3 Reasons for Choice of Stock Firm

As a continuation of 6.2 above, an attempt was made to determine the role of credit services as a factor influencing choice of stock firm (Table 6.3).

Table 6.3

Factors Influencing Respondents Choice of Stock Firm
(% of Sample - 264)

	Spontaneous	After Show Card	Increase
Geographically convenient	10	26	16
Good prices offered	7	16	9
Credit facilities	18	45	27
Good service/advice	36	60	24
"Always dealt with them"	49	63	14
"Tied" to firm	6	12	6
Other reasons	16	-	-
Don't know	1	-	-

The influence of the show card was to markedly stimulate the responses of "credit facilities" and "good service/advice". The latter is likely to be a result of ex-post satisfaction (5.3).

The "credit facilities" factor assumed a larger role in choice of firm than it did in choice of bank (5.4). The show card effect was significantly higher on sheep-type businesses than on other types, and significantly more sheep farmers mentioned this factor than other farmers. A positive response was also associated with age of operator. Younger farmers mentioned "credit" as a choice factor more than older farmers (hypothesis significant at the 5% level).

Whilst not a strict choice factor, 12% of the subsample considered that their level of debt was sufficiently high for them to be "tied", through security restrictions, to a particular firm. This phenomenon was a feature of sheep-type farmers who were in the lower liquidity quartiles. No significant relationships were observed.

Not unexpectedly, tradition emerged as the major choice factor. This response was a feature of respondents with higher equities, but the hypothesis was not significant. Neither was the observation that respondents earning lower rates of return on their assets were more likely to mention prices. The price factor did not assume importance as there are generally only small price differentials between firms.

Only 26% of respondents mentioned geographical convenience as a choice factor. This was lower than anticipated as 86% of all respondents had indicated that they held their accounts with the firm that had the nearest branch to the farm, and 75% indicated that their accounting branch was less than 20 miles from the farm. The conclusion was that branch duplication in population centres has resulted in geographical proximity being a secondary choice factor.

6.4 Importance of Credit Facilities in the Business

As a probe into the considered role of stock firm finance in the farm business the question was phrased:

"You have mentioned/not mentioned the provision of credit facilities as a factor influencing you in your choice of stock firm. How important would you say stock firm credit facilities are in your business?" (Table 6.4).

Table 6.4

The Assessed Importance of Stock Firm Credit
as a Factor in the Farm Business
 (% of respondents - 264)

Very important	24
Important	19
Moderately important	18
Not very important	28
Of no importance whatsoever	11
	<u>100</u>

The distribution on the attitude scale of response confirmed that:

- (i) stock firm credit facilities are a far more important element in the businesses of sheep-type farmers than other types. Only 2% of dairy farmers considered credit facilities to be a "very important" factor compared with 40% of sheep farmers. Credit facilities were considered to be "of no importance whatsoever" to 33% of dairy farmers, compared with only 7% of sheep farmers;
- (ii) farmers in the lower liquidity quartiles rank credit facilities as a more important factor than those in a stronger liquidity position (hypothesis significant at 1%);
- (iii) farmers in middle age groups (31 - 60) rank credit facilities to be a more important factor than those in other groups (hypothesis significant at 1%);
- (iv) farmers with lower equities consider credit facilities to be a more important factor (quartile hypothesis significant at 1%).

Selected business parameters associated with each classification on the attitude scale (Table 6.5) give an indication of the magnitude of significant differences. The results lend support to the field accuracy of the scale assessment.

Table 6.5

Mean Values of Selected Parameters Classified According to Assessed Importance of Stock Firm Credit in Respondents' Business

<u>Parameter</u>	<u>Classification</u>				
	<u>V. imp.</u>	<u>Imp.</u>	<u>Mod. Imp.</u>	<u>Not v. Imp.</u>	<u>Of no Imp.</u>
Farm business assets (\$)	93,530	87,427	102,857	83,773	95,139
Equity (%)**	58	66	69	76	73
Liquidity Ratio	1.1	1.5	1.1	1.8	3.7
Max. stock firm overdraft (\$)**	6,786	3,023	2,244	695	417
Max. bank overdraft	3,320	1,317	2,789	1,464	2,275
Short term debt/farm assets (%)	10.8	5.1	4.9	2.6	2.8
No. of observations	64	51	46	73	30

Key: ** F-test: highly significant differences (1%).

The overall conclusion was that stock firm credit facilities assume especial importance to sheep farmers with lower equities and in a weaker liquidity position.

6.5 Transfer of Account - Ex-Post

It was envisaged that inadequacy of credit facilities might be a major factor in inducing a transfer of account from one stock firm to another. To examine this hypothesis

details of inter-firm transfer were recorded. Of respondents currently operating a trading account, 23% had previously held their primary account (rather than just a casual account), with at least one other firm. Despite the stability exhibited by three-quarters of the sample, the rate was double that of bank account transfer (5.5). The role of tradition as an inertia force is likely to be less for stock firms than banks as a result of stock firms multi-functional role in the farm sector. A significantly higher proportion of dairy farmers (to whom stock firms were of less importance) indicated that they had transferred their accounts. Only 14% of sheep farmers reported a transfer compared with 43% of dairy farmers. Respondents with poorer equities were also more likely to have made a transfer but this observation was not significant.

Reasons given for inter-firm account transfer do not suggest that credit inadequacy is the major stimulant (Table 6.6).

Table 6.6

Spontaneous Reasons for Transferring Trading Account
(% of Respondents - 61)

Poor prices offered	13
Changed farms	15
Poor service given	30
Inadequate credit facilities	23
Personal reasons	25
Other	25

No one dominant factor emerged. A significantly fewer number of respondents mentioned "change of farm" than as a factor in bank transfer (Table 5.6). Older respondents with relatively strong liquidity were more likely to mention "service" and "personal reasons" in explanation.

To verify the observation that credit facilities were not a major factor the probe question was phrased:

"You have mentioned/not mentioned credit facilities as a factor influencing your decision to change firms. How important would you say this factor was?" (Table 6.7).

Table 6.7

The Importance of Credit as a Factor Influencing
Ex-Post Transfer of Trading Account
 (% of Respondents - 61)

Very important	31
Important	16
Moderately important	15
Not very important	20
Of no importance whatsoever	<u>18</u>
	100

There was a close relationship between the assessed role of credit as a change factor and as a current tool in the business (Table 6.4). Results of the probe question revealed no significant differences between the relative importance of credit as a factor influencing transfer of bank or stock firm account.

In both cases the response distributions on the attitude scale were not significantly different from expected values of a random distribution. The conclusion is therefore indeterminate and, for the farm community, inadequacy of credit facilities is neither a major nor a minor factor influencing account transfer.

6.6 Additional Services Offered by Stock Firms

From Table 6.6 above, service was the modal factor influencing a decision to transfer an account. It was envisaged that farmers might have suggestions for improvements in services. These would not necessarily be financial but all account holders were asked:

"Can you think of any services that the firms could offer to be of help to you in the running of your business?"
(Table 6.8).

Only 22% of respondents made any suggestion and few made multiple replies. Interviewers reported that the effect of the distributed information sheet (Appendix M) was that in some cases suggestions were well prepared. In other interviews replies were loose and were restricted to the "better" and "more" type comment. Such spontaneous answers however vague, might still be useful in reflecting the general "feel" of the community.

Table 6.8

Suggestions for Improvements in Stock Firm
Services to Farmers
 (% of Respondents - 59)

Lower Interest Rates	24
Improved advisory services (e.g. budgeting)	19
Increased personal contact	14
Agricultural training for stock firm staff	12
Less restrictive lending	5
Other	28

A small number felt that improvement in the quality of financial service provided could be effected. The ability and willingness to pay for such improvements (e.g. budgeting) was not examined. The mean equity of respondents listing "restrictive lending" was 55%, substantially below the average of 67% of all farmers operating trading accounts. A number of respondents mentioned the interest rate differential of stock firm over trading bank lending, but did not appreciate the additional processing costs involved. Since such comment stemmed from a minority of borrowers in the first instance, the low order of observations does not suggest that the majority of farmers are dissatisfied with the present quality of financial services.

6.7 Characteristics of Firm Credit Users

Sixty five per cent of account holders were active users of overdraft facilities (Table 6.9).

Table 6.9Percentage of Respondents with Stock Firm Overdrafts at
Various Times

(No. of Respondents - 264)

	<u>Nov/Dec 1970</u>	<u>Y/e Nov/Dec 1970</u>	<u>Ever</u>
In overdraft	49.6	64.9	73.9
Approx. standard error	± 2.8	± 2.7	± 2.5

There were no significant differences between each of these three observations and similar bank data (Table 5.10). There were highly significant relationships between presence of overdraft at date of interview and:

(a) age of operator (Table 6.10);

Table 6.10Percentage of Respondents in Overdraft with
a Stock Firm Classified According to Age Group

<u>Age Group</u>	<u>Nov/Dec 1970</u>	<u>Y/e Nov/Dec 1970</u>	<u>Sample Size (Nos)</u>
21 - 30	64	72	25
31 - 40	57	69	67
41 - 50	54	73	85
51 - 60	44	62	61
61 and over	19	26	<u>26</u>
			264

- (b) type of farm. Only 23% of dairy farmers were in overdraft at date of interview compared with 63% of sheep farmers. This may be partially a result of farm cyclical patterns (Table 5.11);
- (c) assessed importance of credit as a factor in the business (Table 6.4);

(d) liquidity and equity quartiles.

It was envisaged that most active users of facilities would have been in overdraft at some time during the year preceding the date of interview. Non-active users were defined as occasional users of overdraft facilities ("ever") but who had not been in overdraft during the previous 12 months. A number of highly significant differences in parameters between active and non-active users were observed (Table 6.11). The t-test was used as the test statistic.

Table 6.11

Comparison of Parameters Between Active and Non-Active
Users of Stock Firm Credit Facilities

	<u>Active Users</u>	<u>Non-Active Users</u>
Farm Business Assets (\$)	95,101	79,220
Stock firm overdraft limit/ max. borrowing	4,396	126
Equity (%)	63	76
No. in sample	171	24

Despite their larger businesses (partly a reflection of farm type) active users might be expected to have relatively lower equities than non-active users. Results of Table 6.11 confirmed the thesis that farmers not in overdraft during the twelve month period were not significant users of firm credit. The mean overdraft limit/maximum borrowing of those in overdraft at date of interview was \$5,116.

From Table 6.9, 26% of account holders have never been in overdraft. (The biasing effect of faulty memory was not investigated). This phenomenon was significantly related to farm type (sheep and dairy); assessed importance of credit in the farm business (Table 6.4); age of operator; liquidity quartile and equity quartile. These observations support the changing goal thesis (2.8 - 2.12).

6.8 Uses of Stock Firm Overdrafts

Finance for livestock purchase was the major observed use made of stock firm overdraft facilities (Table 6.12), and this conclusion has since been confirmed by the Agricultural Production Council.¹

Table 6.12

Uses Made of Stock Firm Overdraft Facilities
(% of active users - 171)

<u>Purpose</u>	<u>Spontaneous</u>	<u>ASC</u>	<u>Increase</u>
Seasonal finance	37	58	21
Working capital	31	59	28
Finance of development work	10	37	27
Purchase of plant and machinery	9	34	25
Tax payments	6	30	24
Stock purchases	55	79	24
Private purposes	4	19	15
To counter income changes	7	23	17
"Try not to go into overdraft"	6	13	7
Don't know	2	-	-

¹ (168) p. 61.

The use of the show card had the effect of significantly increasing response levels in most cases by about a quarter. It was effective in stimulating response amongst lower equity and liquidity farmers, as measured on the quartile basis, particularly where such farmers ran sheep and sheep type businesses. Respondents who did not use bank overdraft facilities were observed to be more extensive users of stock firm facilities.

A number of significant observations were made and these are discussed under each listed heading.

(i) Seasonal Finance

Dairy farmers used their bank account rather than their stock firm account for this purpose (Table 5.13). There was a highly significant relationship between equity quartile and use. Farmers in relatively stronger liquidity positions were more likely to use facilities in this way (liquidity quartile hypothesis significant at 5%), rather than borrow for the more dynamic working capital purpose. Farmers in such positions might be expected to finance most of their working capital requirements from their own resources.

(ii) Working Capital

The difficulties of identification in respondents' minds have been discussed (5.11). The use was a feature

of lower equity respondents and there was a highly significant relationship between positive use and assessed importance of credit facilities (Table 6.4). This result supports the previous conclusion that "Working Capital" is a major use of borrowed funds (5.11).

(iii) Development Work

The only significant relationship was with the "importance" parameter (Table 6.4). For instance 52% of borrowers who considered credit to be a "very important" factor borrowed for this purpose, compared with only 17% who considered firm credit to be "not very important" in their businesses.

(iv) Plant and Machinery

Despite the stock firm's role in supplying plant and machinery, only 34% of active borrowers borrowed for this purpose. This may be a result of the infrequent nature of heavy machinery purchase, and as most farmers were observed to pay cash for small items (8.2). Borrowing for this purpose was restricted entirely to operators of sheep type businesses and was a feature of younger farmers. There was a significant relationship (at the 5% level), between this use and considered importance of credit facilities (Table 6.4).

(v) Tax Payments

Significantly more sheep than dairy farmers used facilities in this way (Table 5.13). It was a feature of middle-aged farmers and was critical to the extent that it was significantly related to the "importance" scale (Table 6.4). These results were similar to those of trading banks (5.11).

(vi) Stock Purchase

This was the predominant use of overdraft facilities. Analysis of the data classified according to age group suggested that use was a feature of middle aged operators, but the statistical hypothesis was not valid.

(vii) Private Purposes

The relationship between this use and the "importance" scale (Table 6.4) was significant at the 5% level. To farmers who considered firm credit to be an important business tool, the use was critical.

(viii) Finance to Counter Income Changes

With the exception of farm type (Table 5.13) no significant relationships were observed. This use was a non-significant feature of respondents with lower equities.

(ix) "Try Not to Go Into Overdraft"

The response was associated with a relatively strong equity or liquidity (Table 6.13). Interviewees who gave this response were unlikely to have given any other, but surprisingly it was not related to age of operator.

Table 6.13

Respondents Who "Try Not to go Into Overdraft" Classified
According to Equity and Liquidity Quartile
 (By Number)

<u>Equity Quartile</u>	1	2	3	4	<u>TOT</u>
No. of respondents	92	92	92	92	368
No. with stock firm a/c	72	66	63	63	264
Active users	52	52	46	21	171*
"Try not to go into overdraft"	7	5	6	4	22*
<u>Liquidity Quartile</u>	1	2	3	4	<u>TOT</u>
No. of respondents	92	92	92	92	368
No. with stock firm a/c	76	66	60	62	264
Active users	69	46	33	23	171*
"Try not to go into overdraft"	7	1	7	7	22*

* significant relationships with relevant parameter observation.

The small level of "don't know" response shows that users are aware of the ways that they use stock firm overdraft facilities. Apart from stock purchase finance there were no significant differences between uses (by number) made of farm and bank facilities. The differences lay in the type of farm business using the facilities.

Critical uses of firm facilities were observed to be those of working capital, plant and machinery purchase, tax, private purposes and to a lesser extent development. These were similar to those revealed by trading bank data (5.11).

6.9 Problems in Use of Stock Firm Overdraft Facilities

It was hypothesised that some farmers may be experiencing difficulties in their use of current account facilities. An attempt was made to quantify the extent of this experience (Table 6.14).

Table 6.14

Problems Experienced by Users of Stock Firm Credit Facilities

(% of Active Users - 171)

Credit expensive	47
High security required	6
Credit difficult/impossible to arrange	2
Rapid rate of repayment required	7
Excessively cautious in lending	5
Willing to provide only small loan	2
Interfere in running of business	4
Insufficient agricultural knowledge	6
None of problems experienced	53

The business characteristics of respondents with each problem have been summarised in Table 6.15.

(i) Credit Expensive

Whilst only 11% of respondents using bank facilities believed bank credit to be expensive, 47% of stock firm borrowers held this view. This significant difference reflected extensive awareness of the interest differential charged by stock firms. On the other hand interviewers reported that few farmers were aware of any processing cost variation, and many believed low interest rates to be a fundamental inbuilt feature of farm financing.

Respondents with this comment tended to earn a lower rate of return on their businesses (Table 6.15) and the margin between average cost of and return on capital would therefore be relatively smaller. The relationship of response with age was highly significant (Table 6.16), and there was also a relationship with equity and liquidity quartile.

Table 6.15

Business Parameters (Average) of Respondents Citing Problems Experienced in Using Stock Firm Facilities

No.	Problem	Equity %	Profit/ Sales %	Profit/ Assets %	CA/CL Ratio	Business Valuation (\$)	Maximum Bank Overdraft (\$)	Maximum Firm Overdraft (\$)	Short Term Debt as % Assets	Business Drawings (\$)	No. of Respondents
1.	Credit expensive	54	17.4	3.4	0.9	85,546	2,873	4,900	9.1	2,703	80
2.	High security required	50	21.4	3.1	0.3	75,237	2,370	3,804	8.1	3,455	10
3.	Credit difficult/ impossible to arrange	21	28.3	3.7	0.3	57,522	6,300	3,681	17.4	5,706	3
4.	Rapid rate of repayment required	50	25.0	4.6	2.3	83,551	4,117	1,692	7.0	2,809	12
5.	Excessively cautious in lending	56	27.1	7.0	3.1	77,804	3,813	2,288	7.8	3,824	8
6.	Willing to provide only small loan	42	25.7	3.7	0.6	109,681	7,975	8,825	15.3	2,380	4
7.	Interfere in running of business	55	-0.5	0.0	0.3	113,774	2,500	5,143	6.7	3,576	7
8.	Not sufficient agricultural knowledge	43	19.5	2.8	1.1	78,587	2,440	4,604	11.1	4,100	10
9.	None of problems experienced	71	26.2	5.0	1.0	92,108	1,884	2,773	6.3	3,018	91

Key: CA Current Assets
CL Current Liabilities.

Table 6.16

Percentage of "Users" believing Stock Firm Credit Facilities
to be Expensive
 (Classified According to Age Group)

<u>Age Group</u>	<u>%</u>	<u>Total Users (No.)</u>
21 - 30	64	18
31 - 40	51	46
41 - 50	43	62
51 - 60	43	37
61 and over	25	8

(ii) High Security Required

The restriction was mentioned by a significantly lower proportion than those borrowing from trading banks (5.12). This is likely to be a reflection of the less formal business relationship of clients with their stock firms.

(iii) Credit Difficult/Impossible to Arrange

All three respondents had low equities in small businesses (Table 6.15). They all rated firm credit as a very important business factor (Table 6.4), and their short-term debt was high in relation to their business assets. All three were young and from interviewer's reports were efficient farmers. Whilst the operation of their businesses may have been restricted, the low equity would be unlikely to support further borrowing. Note may be taken of the relatively

high drawings. However the sample was not sufficiently large for these results to be anything other than case studies.

(iv) Rapid Rate of Repayment Required

The mean equity of such respondents in their businesses was not high though earning power and liquidity were comparatively favourable (Table 6.15). Significantly more dairy farmers (25% of users of firm facilities) mentioned the problem than sheep farmers (1% of users). The observation may be a reflection of the traditional association of stock firms with the sheep, rather than dairy sector. Since trading banks are observed to be the major source of finance to dairy farmers, the conclusion is that the problem is not an extensive one experienced by the sample and therefore population.

(v) Excessively Cautious in Lending

Significantly fewer respondents had experienced this restriction than users of bank facilities (Table 5.14). No other observations were made but the small sample would prohibit any valid inferences.

(vi) Willing to Provide only Small Loan

Existing debts of these respondents to stock firms were large (Table 6.15). The "problem" was restricted to four farmers who considered stock firm credit to be an important factor in their business and who also used bank funds extensively. The small sample prohibited further investigation but a significantly fewer number reported experiencing this problem with stock firms than with banks.

(vii) Interfere in Running of Business

Whilst such respondents were on average employing assets of \$114,000 in their businesses they were earning negative returns (Table 6.15). They tended to be in a relatively weak liquidity position and with one exception were all in the 31 - 40 age group. This result ^{together} interpreted with interviewers' reports suggested that there may be managerial problems and that third party "interference" is the result. Detailed analysis of each individual case would be necessary to justify firm conclusions.

(viii) Insufficient Agricultural Knowledge

It was not unexpected that significantly fewer respondents would mention this problem in relation to dealings with stock firms rather than trading banks.

This is a result of the direct relationship of stock firms with the farm sector. Where made, the observation was a feature of younger farmers with relatively low equities (Table 6.15). The small sample problem limited further investigation.

(ix) None of Problems Experienced

These farmers had relatively strong equities (Table 6.15) and there was a significant relationship with equity quartile. They tended to be earning relatively higher returns from their businesses than those with problems. Age of operator played an explanatory role, and whilst 42% of borrowers in the 21 - 30 age range reported "no problems", 80% of borrowers over 60 years old gave the response. Younger farmers have been shown (Table 6.10) to use firm overdraft facilities more extensively and are therefore more susceptible to the effects of listed problems. Even so, the conclusion that operators in stronger financial positions experience less problems is valid, and is consistent with previous findings (Table 5.12).

6.10 The Role of Limits

The effect of bank overdraft limits was not shown to be a restrictive constraint on the business structure

of the majority of farmers (5.13). Only 28% of users of firm overdrafts were operating under stated limits and this was significantly lower than the proportion, 76%, of those operating under a bank overdraft limit. The suggestion is that overdraft limits have not been a traditional feature of stock firm lending.

Respondents operating under limits were not borrowing sums significantly different from those without limits (Table 6.17 - t-test conclusion).

Table 6.17

Mean Limit/Maximum Borrowing in Farm Businesses
From Stock Firms
 (y/e 30th June 1970)

	<u>No. of Resps.</u>	<u>% of Resps.</u>	<u>\$</u>
(i) Limit	48	28	4,194
(ii) "Maximum Borrowing"	123	72	4,476
(iii) Mean Borrowing (i) and (ii)	171	100	4,396

Significantly more younger farmers were operating under a stated limit (relationship with age distribution significant at 1%) and these were generally farmers with lower equities (Table 3.7) who rated firm credit facilities to be an important business factor (6.4).

Of the 48 respondents with limits, 17 had attained their limit during the year ending 30 June 1970, and a further 11 had reached their limit at "one time" during their farming career. Both these observations suggest that the use of the limit

device by stock firms has not proved restrictive to the majority of borrowers. The conclusion is reinforced by the reply to the question (put to borrowers currently operating under a limit):

"Have you always had your request for a change in overdraft limit granted?"

Only 9% indicated that they had not. With this low response and the vague explanations given, no further analysis was made.

6.11 Overdraft Reduction and Refusal

Only 13% of borrowers indicated that they had ever been asked to reduce their overdraft compared with 20% of those using bank facilities (5.14). Similarly, 96% of borrowers indicated ~~that~~ they always had their requests for stock firm overdrafts granted, compared with 81% of trading bank borrowers. Both stock firm observations were high, and may have been influenced by personal considerations. Respondents earning lower rates of return on sales, and those who considered stock firm credit to be an important business factor (Table 6.4) were more likely to have been asked to reduce overdraft. Both hypotheses were not significant.

It was originally hoped to build up a description of borrowers from stock firms who had been asked to reduce their overdrafts or who had in the past been refused accommodation. As the majority of respondents reported never having experienced these problems, this analysis would have been of limited usefulness.

6.12 The Role of Security

Whilst limits were not observed to be an important control over stock firm borrowing (6.10), security requirements may serve as an alternative limiting device. The borrowings of 25% of credit users were secured by way of a stock and chattel security deed. There were close relationships between the presence of secured accounts and observable parameters:

- (i) significantly more accounts of lower equity borrowers were secured;
- (ii) borrowers with weaker liquidities were more likely to be operating with a secured account, e.g. 34% of borrowers in the first liquidity quartile, compared with 17% in the fourth quartile (non-significant relationship);

(iii) younger farmers (particularly in the 21 - 30 age group) were more likely to be operating with a secured account (non-significant relationship);

(iv) respondents who considered stock firm credit to be a relatively more important business factor (Table 6.4) were more likely to be operating with a secured account (non-significant relationship).

These results suggest that security requirements are a feature of borrowers who use stock firm funds extensively in their businesses. Further information was sought on the attitude of farmers to the security requirement. Two questions were asked to all 368 farmers in the sample, rather than merely to stock firm borrowers:

- (i) "Do you normally expect short-term loans to be made to farmers on an unsecured basis?"
- (ii) "How do you feel about putting up security for a short-term loan?"

A third of the sample believed that short-term loans (such as trading bank and stock firm borrowing) should be made to farmers on an unsecured basis, 60% that they should not and 7% did not have an opinion. Study of the business parameters of

respondents making these replies shows that those in stronger equity, liquidity and relative profitability positions were more favourably inclined towards offering security (Table 6.18).

"Agreeable" farmers had on average more security available, even though there was no significant difference in the average value of business assets employed.

Younger respondents appeared less prepared (though more likely to be asked) to offer security than older farmers. For instance, 41% of respondents in the 21 - 30 age group believed that short-term loans should normally be made to farmers on an unsecured basis, compared with only 15% in the over 60 age group. For stock firm and trading bank account holders, the belief was independent of considered importance of credit (Tables 5.4, 6.4). There were cases of respondents who considered respective overdraft facilities to be "of no importance whatsoever" as a business factor, but who held strong views on security requirements.

Verbal expression of these views was generally vague but a summary indicates that some farmers consider a request for security to be a personal affront (Table 6.19). This was in view of their farming experience and personal integrity (self-considered), rather than their financial position.

Table 6.18Mean Business Parameters of Respondents Relative
to Their Attitude Towards Security

<u>Parameter</u>	<u>Disagreeable</u> (do not expect to offer security)	<u>Agreeable</u> (expect to offer security)
Farm business assets (\$)	87,131	87,011
Mortgage Debt (\$)	26,018	15,459**
Other Debt (\$)	6,968	4,504**
Equity (%)	61	72**
Profit/sales ratio (%)	23	29
Profit/assets ratio (%)	5.0	6.4*
Liquidity ratio	1.2	1.9
No. of respondents	124	219

Significance (t-test) ** 1%;
* 10%.

The majority of the sample accepted that a request for safeguard security was a legitimate business/and that lending institutions should not solely stand risk. If a borrower was assured of success of a project then he should not be unduly concerned with a request for security.

Table 6.19Summary of Major Reasons Behind the Attitudes on Security
(% of respondents)

- (a) Disagreeable (do not expect to offer security - 124 respondents)
- Extensive farming experience
(i.e. only borrow on sound propositions) 15
 - Loans only for short-term
(i.e. rapid repayment assured) 13
 - Possess high integrity 12
 - Loan only for small amount
(i.e. institutional commitment small) 10

(b) Agreeable (expect to offer security - 219 respondents)

Minimise risk to lender	45
Accepted business practice	33

Note: There were numerous "other answers"; also cases where respondents offered "no comment".

From these verbatim comments the use of the security measure as a pre-requisite to short-term borrowing from lending institutions did not appear to have significant effects. The farming community as a whole accepted the use of the device and understood its purpose.

6.13 Farmers Without a Stock Firm Account

The study (6.1 - 6.12) has been limited to an examination of the role of the stock firm account in the farm business. Twenty eight per cent of the total sample were not running an active firm account at date of interview (6.2), though 5% of all respondents had at one time operated but terminated an account. No significant parameters were related to these respondents and no factor was predominant in the explanation of account closure. "Preference" for use of bank facilities and the lack of any benefit in dealings with a stock firm on a current account basis were mentioned as the reason for half of the closures. The direct influence of credit as a factor was small. Three farmers (out of the 18 who had closed accounts) mentioned that "high interest rates" had

encouraged them to transfer their financial business to a trading bank, and three mentioned a dislike of being "tied" to a stock firm.

Of the 86 farmers without a trading account only 6% had ever thought of operating one. The questions were phrased:

- (i) "Can you say why you have never opened a trading account with any firm?"
- (ii) "Do you think that there would be any benefit to you in operating a trading account?"

Whilst 86% of these respondents could see "no advantage" in operating an account, few were able to substantiate their replies. A feeling that stock firms were "not interested" in dairy farmers was apparent in a few cases. Other farmers preferred to "shop around" as in this way they received "better service and attention". A fear of being "tied" was a deterrent to 25 farmers and 12 mentioned that "expensive" firm credit prohibited them from operating an active account. Whilst adverse features of stock firm lending in these farmers' minds is limiting their propensity to operate an account, additional motivational study is necessary than the interview framework would allow, before firm conclusion can be drawn.

6.14 Summary

The financial stock firm-client relationship has been examined. Some observations are similar to those of the trading bank investigation and the study concludes that:

- (i) Use of stock firm account and credit facilities are features of the sheep rather than the dairy farmer (6.1);
- (ii) In some cases credit facilities are an important factor in choice of firm (6.3), but do not have a major role in account transfer (6.5). To some farmers credit facilities are an important function of stock firms (6.2);
- (iii) The use of overdraft for livestock purchase is extensive (6.8). "Critical" uses are similar to those identified in examination of trading bank data;
- (iv) Farmers in general are not critical of stock firms. Only 22% (\pm 1.5%) of all survey respondents had experienced "problems" in their financial dealings with stock firms (Table 6.20). Interest rates emerged as the major complaint (6.9). The

financial position of respondents was related to reported incidence of "problems" (Table 6.15);

Table 6.20

Percentage of Sample Experiencing Problems in Use
of Stock Firm Overdraft Facilities

	<u>%</u>	<u>No.</u>
(1) Total sample	100	368
(2) <u>Less</u> without a firm a/c	<u>28.3</u>	<u>104</u>
(3) Respondents with firm a/c	71.7	264
(4) <u>Less</u> non-active users of o/d facilities	<u>25.2</u>	<u>93</u>
(5) Active users of o/d facilities	46.5	171
(6) <u>Less</u> "none of problems experienced"	<u>24.6</u>	<u>91</u>
(7) Problems experienced	21.9	80

(v) The use of overdraft limits as a rationing device is not widespread (6.10);

(vi) Despite the use in some cases of limits and security requirements, farmers believe that their legitimate financial requests have in the past been met by stock firms (6.11 - 6.12).

CHAPTER SEVENThe Farm Credit Survey:Other Sources of Finance(a) Dairy Companies7.1 Introduction

In the interview structure little attention was paid to financial implications of the farmer-dairy company relationship. This was primarily a result of the experience of the Department of Agriculture in their 1963 Credit Survey.¹ The Department observed that dairy companies accounted for under 1% of the volume of mortgage debt outstanding at that time and that short term lending by dairy companies was very limited. The small debt volume is primarily a result of the monthly milk cheque system, whereby monthly debt is deducted from the cheque. In this way debts do not normally carry over from month to month.

Only 15% of all respondents in the 1970 Survey operated a current account with a dairy company, and these were all dairy farmers. Of these respondents, 65% (or 36 farmers) reported that they used dairy firm overdraft facilities. Interviewers reported that the concept of a dairy company "overdraft" was unfamiliar to farmers, and that many considered the monthly cheque system to be hardly a financial relationship.

² Miller, J.G., op. cit. p. 19.

The figure above should therefore be interpreted with caution. Respondents in a less liquid position were more likely to use overdraft facilities, but the observation was not significant.

7.2 Uses of Dairy Company Overdrafts

An attempt was made to determine the uses made of the very short term overdraft facilities offered by dairy companies (Table 7.1).

Table 7.1

Uses Made of Dairy Company Overdraft Facilities
(% of active users - 36)

<u>Purpose</u>	<u>Spontaneous</u>	<u>ASC</u>	<u>Increase</u>
Seasonal finance	14	17	3
Working capital	22	31	9
Finance of development work	64	72	8
Purchase of plant and machinery	25	33	8
Tax payments	-	-	-
Stock purchase	11	11	-
Private purposes	6	6	-
To counter income changes	-	8	8
"Try not to go into overdraft"	6	8	-
Don't know	-	-	-

The prominent observation was that 72% of users indicated that they used facilities for minor development purposes. This was largely a spontaneous comment as the showcard only resulted in an 8% increase in response. The apparent importance of dairy company funds to finance this work was not apparent from Pilot Survey results, or previously

collected background information. It suggests the need for a more extensive investigation into uses made of dairy company credit than the Survey attempted. Despite prompting, other uses were low since the dairy farmer is able to use his bank account for these purposes (Table 5.13). No relationships were observed between any use and business parameter.

7.3 Adequacy of Facilities

Borrowers were asked:

- (i) "Would you say that in general the credit facilities offered by your dairy company are adequate for your purposes?"
- (ii) "Can you think of any improvements in credit facilities that your dairy company could make?"

Thirty-three borrowers considered in general terms that facilities were "adequate", one that they were "inadequate" and two that they did not know. The low level of apparent dis-satisfaction may be a reflection of the limited use made (or allowed) of dairy company facilities, or indeed whether they are offered anyway. Only four users made any suggestions for improvements, and in all cases these were farmers in the 21 - 30 age group with relatively low equities.

7.4 Summary

The brief examination of the use made of dairy company overdraft facilities has shown that farmers consider very little to be wrong with the status quo. As a result of pre-survey experience (7.1) no quantitative assessment of debt owing to dairy companies, as at June 30th 1970, was made. Ex-post study of reported uses (Table 7.1) suggests that the analysis could profitably have been made in more detail.

(b) Private Funds

7.5 Introduction

The role of private individuals as a source of finance in agriculture has traditionally been extensive, though the Agricultural Production Council in April 1971 noted that the marginal role, in the provision of new finance, is decreasing.² At 30th June 1970 this source of finance accounted for 31% of all farm debt outstanding (Table 7.2).

Table 7.2

Proportion of Total Sample Debt Owing to Private Individuals

	<u>\$m</u>	<u>%</u>
Total debt outstanding	10.094	100
Private Individuals (secured)	2.696	26.7
" " (unsecured)	0.413	4.1
" " (all)	3.109	30.8

7.6 Distribution of Private Debt

Private funds were defined to include monies loaned to a farm business and included as a balance sheet liability, but not secured under any formal deed. The classification included both short and long term loans, and was similar in concept to "cash loans" in the Department of Agriculture's 1963 Survey.³ Respondents were asked to indicate the loan balance outstanding as at June 30th 1970, and the average recorded debt per farm business was \$1,122 (+ \$4,629). There was considerable variation from this mean, which represented a 75% increase from the Department of Agriculture estimate of \$640. The presence and magnitude of debt was closely related to age of farm operator (Table 7.3).

Table 7.3

Proportion of Age Groups with Private Debt Commitment and Magnitude of Debt

<u>No. in Sample</u>	<u>Age Group</u>	<u>% of Group Owning Debt</u>	<u>Average Debt (\$)</u>	
			<u>Per Farmer/Age Group</u>	<u>Per Borrower</u>
29	21-30	34	1,258	3,648
92	31-40	27	2,300	8,464
115	41-50	27	1,034	3,835
92	51-60	14	360	2,548
39	61-	10	333	3,247
368	All	23	1,122	4,858

³ Miller, J.G., op. cit., pps. 21, 30, 115.

There were similar significant relationships with equity and liquidity quartile.

Unsecured private debt was therefore a feature of younger farmers in relatively weaker equity and liquidity positions, and in some cases was an important source of finance. Use was a feature of sheep rather than dairy type farming. Average levels of unsecured private debt were observed to be significantly higher in Canterbury and in the Hawkes Bay/East Coast region than in other areas of New Zealand. This result supports similar conclusions made in the Department's 1963 Survey.

7.7 Source of Private Debt

The 83 respondents who owed unsecured monies to private individuals were asked to indicate the source. Parents were the source in 48% of cases and wives in 29%. Younger farmers tended to borrow from their parents and older farmers from their wives (Table 7.7).

Table 7.7

Sources of Private Debt Classified
According to Age of Operator
 (as Percentage of Each Age Group)

<u>Source</u>	<u>Age Group</u>	<u>21-30</u>	<u>31-40</u>	<u>41-50</u>	<u>51-60</u>	<u>61-</u>	<u>ALL</u>
Parents		60	69	39	23	25	48
Wives		10	15	35	46	50	29
Other Family		20	16	23	31	25	21
Other		<u>10</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>-</u>	<u>2</u>
		<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>
Sample Size		10	25	31	13	4	83

7.8 Uses of Funds

Borrowers of private funds were asked:

"Can you say for what purposes you borrowed this money?" (Table 7.8).

Table 7.8

Uses made of Funds Borrowed from Private Sources
(% of Respondents - 83)

Land Purchase	47
Capital/development expenditure	19
Working Capital	15
Private Purposes	8
Other	17
Don't Know	1

A number of respondents gave multiple responses.

Nearly half of all unsecured loans of this type were borrowed for land purchase. Dairy farmers were observed to use funds relatively more for development purposes.

7.8 Reasons for Borrowing

It was envisaged that if funds were borrowed for land purchase they would be to supplement mortgage sources, as in most cases the unsecured debt reported (even though representing debt outstanding) would be insufficient to finance any substantial land purchase. This may be as a result of limits on the availability of finance from mortgage sources, forcing borrowers to complete purchase with private funds. To investigate this hypothesis the question was phrased:

"Can you say why you borrowed from...
(your private source)?" (Table 7.9).

Table 7.9

Reasons for Borrowing from Private Sources
 (% of respondents - 83)

Funds available/plentiful	51
Cheap funds	42
Personal reasons	29
"Could not borrow from institutions"	15
Less restrictions over use	8
Other	6

As only 15% of private borrowers mentioned institutional limitations, the "last resort" comment was secondary as an explanatory factor. Low equity respondents were more likely to have answered in this way, but the small sample size prohibited hypothesis testing. The effect of low and in some cases zero interest rates, and knowledge of availability were the major factors influencing private borrowing. Personal reasons (such as the re-distribution of assets in an attempt to reduce tax burden) influenced 29% in their decision to borrow from private sources. The favourable cost of funds was the major influencing factor for dairy farmers and availability the major factor for sheep farmers.

7.9 Propensity to Borrow from Institutions

As a check on these observations above (7.8), the question was phrased:

"If you had not been able to borrow privately do you think that you would have tried to borrow from a lending institution?"

Seventy-two per cent of private borrowers indicated that they would have approached an institution. Respondents who would not have approached an institution offered several explanations for their behaviour. There were insufficient reasons to permit any formal summary analysis and each explanation was interpreted as a case study. Only one borrower with an equity of 4% indicated that his initial request for finance had been refused by an institution. The difficulty of servicing an institutional rather than a private debt was mentioned by one respondent with an equity of 28%. Other borrowers suggested that their projects were not of sufficient importance to warrant institutional borrowing.

The role of private funds in the farm business therefore emerged as a supplement to institutional funds at a cheaper cost and in some cases was more readily available. In marginal cases this source of funds was critical but in relation to other sources of finance the role was still relatively minor.

CHAPTER EIGHT

THE FARM CREDIT SURVEY -DEMAND FOR PROJECT TYPE FINANCE8.1 Introduction

A description of structural parameters of and behaviour in the farm credit market has been presented (Chapters 3-7 incl.) from Survey data. The Survey also attempted to determine aspects of the ex-ante use likely to be made of credit facilities to finance projects. Four types of farm projects are considered (plant and machinery purchase, buildings erection, improvement and development work, and home capital expenditure) in relation to business need, propensity to borrow to finance the project and reasons for not borrowing, if borrowing is not an acceptable means of finance.

No attempt has been made from Survey data to predict future capital expenditure. This is as a result of the general recorded vagueness of farmers' plans, the difficulties of costing expenditure and the large subjective variance of individual and aggregate estimation.

(a) Plant and Machinery8.2 Methods of Payment

As a background to the study, payment methods for plant were investigated. The question was designed to be

unbiased but a request for information on expected¹ payment methods presented problems in interview. Different methods of payment might be expected for the purchase of an irregular and expensive, compared with a regular and inexpensive item. The method of payment might be a reflection of the state of capital stock in a business. A younger operator with a limited capital stock might be expected to buy heavier and more expensive items than an older operator. There were significant relationships between age of operator and method of "normal" payment (Table 8.1).

Table 8.1

Relationships between Expected Method of Initial Payment
for Plant and Machinery and Age of Operator
 (% of respondents in each age group)

<u>Method</u>	<u>Age Group</u>					
	<u>21-30</u>	<u>31-40</u>	<u>41-50</u>	<u>51-60</u>	<u>61-</u>	<u>ALL</u>
Cash	45	55	55	63	82	59
On account	38	30	27	22	5	25
Hire Purchase (terms)	3	8	4	4	8	5
Cash/terms	14	4	13	11	3	9
Other	-	3	1	-	2	2
	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>
Sample size	29	92	115	92	39	368*

* includes one respondent less than 20 years of age.

¹ Expected defined in its statistical context.

The table highlights the reliance of older operators on the cash payment method and the relative reliance of younger operators in the first instance, on the account method. Hire purchase has not yet become an extensive method of plant financing. The distribution of payment methods was also related to:

- (i) respondents' equity and liquidity (distribution of cash payment response significantly related to both quartile distributions). Respondents in a stronger financial position were more likely to pay cash;
- (ii) the nature of equipment purchased at the stage of the life cycle. Younger farmers with generally more expensive needs were more likely to pay initially through an account or on hire purchase terms;
- (iii) the changing willingness to incur debt (see below).

From investigation of the use made of stock firm and trading bank overdraft facilities (Tables 5.12, 6.12), 27% of the entire sample use their overdrafts for plant purchase in the first instance. This figure is comparable with the 25% of the sample who indicated that they normally make such purchases on account (Table 8.1).

8.3 Future Needs

It was observed that 68% of the sample had made some plant or machinery purchase during the year ending November/December 1970. Future demand would result from replacement requirements and the need for additional machinery not employed in the business at present. Interviewers reported difficulty in distinguishing between these concepts but 32% of the sample indicated a current need for replacement plant or machinery and 35% a need for additional plant or machinery. Both responses were significantly related to equity and liquidity of respondents. For instance 43% of respondents in equity quartile one indicated the need for replacement equipment compared with 23% in quartile four. The need for additional equipment was significantly related to age of operator. Whilst 52% of farmers in the 21-30 age group mentioned the need, only 28% in the over-60 group mentioned it. These conclusions are reasonable as the problem of capital scarcity in relation to productive possibilities available are likely to be more acute for the younger farmer.

Plant needs were related to farm type. Significantly more sheep than dairy farmers mentioned the need for replacement trucks, and vice versa for milking equipment. Tractors were the major replacement need, by number.

It was originally planned to list the needs of farmers and record their estimates of likely purchase date. As 51%

of respondents with needs had no firm plans when the items would be purchased, this approach was abandoned. There was a relationship between dollar value of need² and planned purchase horizon. The untested hypothesis was that there was a large element of impulse buying for smaller items of plant and machinery in the farm sector. A closer examination of this concept and a more detailed study of ex-post and ex-ante purchase decision factors would have been valuable but would have excessively added to interview time.

8.4 Attitude to Borrowing

Despite the vague nature of time horizon responses, farmers with stated plant needs (8.3) were asked:

"Have you thought about borrowing to buy...
(the stated item(s))?"

The nature of response was in some cases related to the type of item mentioned, and would not therefore fully reflect the respondents' general attitude to borrowing for plant. Experience on the Pilot Survey where more general questions on plant borrowing attitudes were asked, indicated the need to associate a specific item in the respondents' mind

² Interviewers were instructed to interpret "need" as "effective need" i.e. prepared to be supported by purchasing power, throughout.

as a prerequisite to any specific answer, and from this to try to understand collective attitudes to borrowing for plant³. As there was a wide range of needs mentioned, it was assumed that the biasing effect of specific items on attitude determination would be minimised. Despite the theoretically inconsistent question phrasing, the pattern of response did suggest that actual specific answers were related in aggregate to general attitudes prevailing in the sector.

Of the 192 respondents who indicated a need for new and/or replacement plant, only 22% had contemplated borrowing. There were a number of significant differences between "borrowers" and "non-borrowers" (Table 8.2).

Table 8.2

Mean Parameters of "Borrowers" and "Non Borrowers"
(Plant and Machinery Purchase)

<u>Parameter</u>	<u>"Borrowers"</u>	<u>"Non-Borrowers"</u>	<u>Signif. diff.</u>
Farm business assets (\$)	91,885	89,188	(t-test)
Mortgage debt o/s (\$)	31,154	20,376	1%
Short term debt o/s (\$)	10,023	5,816	1%
Equity (%)	55	65	
Liquidity Ratio	0.8	1.6	
Sample Nos.	42	150	

³ This represents the "association" approach to interview investigation. Specific answers relating to a specific item (e.g. attitude to borrowing for a specified item of plant) are used, in aggregate, to generalise an answer (e.g. attitude to borrowing for plant). The approach is useful when generalised questions (such as attitude to borrowing for plant) in the first instance, bring only hazy or incomplete responses.

Despite similar business sizes, "borrowers" were observed to be carrying a heavier debt load than "non-borrowers". They were in a relatively weaker equity and liquidity position and tended to be younger. The implication is that the demand for funds for plant purchase is likely to stem from the more heavily indebted farmers who have less marginal security available than "non-borrowers". Prospective borrowers were asked:

"Can you say why you haven't borrowed already?" (Table 8.3).

Table 8.3

Spontaneous Reasons for Not-Borrowing
(Already) (% of Borrowers - 42)

Purchasing plans not definite	52
Trying to arrange finance	17
Already borrowing	17
Other answers	14
Don't know	10

Table 8.3 shows that over half of prospective "borrowers" had not borrowed as the project itself had not been finalised. A smaller proportion were currently negotiating for finance, and those "already borrowing" indicated that plant purchase would automatically be added to their current account overdraft.

196.

5.5 Reasons for Not Borrowing

Non-borrowers were asked:

"Can you say why you would not borrow?"

Table 8.4

Spontaneous Reasons for Not-Borrowing
(% of Non-Borrowers - 150)

Finance expenditure from income	80
In sufficient debt already	17
Pessimistic about future state of farming	7
Can't borrow any more	3
Other	17

From macro-data, a close relationship between estimated disposable income and expenditure on plant and machinery was observed (1.4). Micro-survey data supported this observation, and a significant distribution of this response was associated with age. For instance only 31% of non-borrowers in the 21-30 age group replied in this way compared with 100% in the over 60 group. A significant relationship was also observed between response distribution and equity quartile. The conclusion was not unexpected that older farmers with stronger equities would be more likely to want to finance plant

purchases from income rather than borrowing. It was observed that significantly more dairy-type farmers than sheep farmers mentioned the income factor. Dairy farmers have been observed to use their overdrafts less for plant purchase than sheep farmers (Table 5.13).

From Table 8.4, 17% of non-borrowers stated that they had reached their limit of internal capital rationing, and only 3% that they had reached the external capital rationing limit.⁴ There was a significant relationship between age and the internal rationing factor. In the 21-30 age group, 38% of non-borrowers mentioned that they were "in sufficient debt already", compared with 8% in the 51-60 group and no farmers over 60 years of age. There was also a significant relationship between the internal rationing factor and equity quartile. Internal rationing is therefore a direct feature of younger farmers with relatively weak equities, and may act as a check on production maximisation for the farm sector as a whole. The "income" response, implying indirect internal rationing, was a feature of older respondents. Significantly more dairy than sheep farmers mentioned the internal

⁴ See Hesser (100), Nesser and Janssen (101), for theoretical discussion of these concepts. External rationing refers to credit not being made available to a business as a result of institutional factors (e.g. lack of security). Internal rationing refers to borrowing limits self imposed by the farm entrepreneur (i.e. his reluctance to incur debt).

rationing factor as such, but these farmers have been observed to be in a relatively weaker financial position (Table 3.8).

A small number of respondents mentioned that lack of confidence in the future of the industry was inhibiting their propensity to borrow. Response distribution was not related to any parameter but more farmers may have mentioned the factor if the prompting technique had been used. The observation that changes in debt level can in part be attributed to changes in confidence has been discussed (1.4).

In conclusion, through use of the "association" approach (8.4) attitudes towards borrowing for plant purchase have been briefly examined. Younger farmers with a lower equity and liquidity were observed to have a greater propensity to borrow. The majority of farmers prefer not to borrow for such purchase, and this is largely attributable to the desire to relate capital expenditure to income.

(b) Erection and Extension of Farm Buildings8.6 Future Needs

Capital sums⁵ on buildings had been spent by 33% of the sample during the year ending at the date of interview, and 50% had current building needs. Significantly more dairy farmers (63% of the total) had incurred ex-post capital expenditure than sheep farmers (34%). This is likely to be a reflection of the relatively greater role of buildings in the dairy type business. There was a relationship between ex-ante need and age of operator. Significantly more young farmers needed to carry out expenditure on buildings.

The "association" approach (8.4) was used as the determinant of question order and this required information on the type of building work contemplated (Table 8.5). Where more than one building project was cited, respondents were asked to indicate the principal need.

Table 8.5

Building Needs Listed by Respondents
 (% of Respondents - 183)

Hayshed	30
General sheds	28
Wool/shearing shed	23
Stock yards	10
Other	9

⁵ Interviewers were instructed to exclude repair and maintenance type work.

Interviewers reported that the desire for hay storage facilities was a direct result of the 1969/70 drought that many had experienced. Some building need may therefore be directly attributable to short-term expediency rather than long-term planning. The proportion mentioning the need for a woolshed was considered high in view of wool marketing prospects in late 1970.

Farmers appeared to be more definite in their building plans than in plant plans, and 58% indicated that they intended to complete their project within a year. This suggests that buildings assume a relatively greater role than plant in the planning horizon. Project completion date was related to age of operator. Younger farmers tended to have greater dollar building needs, whereas the projects of older farmers were generally more of an extension type nature, and likely to be completed in a shorter time.

8.7 Attitude to Borrowing

Of the 183 farmers who needed to carry out capital expenditure on buildings, 25% indicated that they would consider borrowing. Potential borrowers were younger, and were carrying a heavier debt load than "non-borrowers" (Table 8.6).

Table 8.6

Mean Parameters of "Borrowers" and "Non-Borrowers"
(Capital Expenditure on Buildings)

<u>Parameter</u>	<u>"Borrowers"</u>	<u>"Non-Borrowers"</u>	<u>Signif. diff.</u> <u>(t-test)</u>
Farm business assets (\$)	80,658	84,423	
Mortgage debt o/s (\$)	24,439	19,506	1%
Short term debt o/s (\$)	8,327	5,375	5%
Equity (%)	57	69	5%
Liquidity Ratio	1.2	1.2	
Sample Nos.	45	138	

Respondents who were contemplating borrowing were asked the supplementary question:

"Can you say why you haven't borrowed already?" (Table 8.7).

Table 8.7

Spontaneous Reasons for Not Borrowing Already
 (% of Borrowers - 45)

Building plans not definite	37
Trying to arrange finance	15
Already borrowing	15
In sufficient debt already	13
Can't obtain finance	7
Other	20

The distribution pattern was similar to Table 8.3 above and the modal response was that plans had not been finalised. A smaller proportion were currently engaged in the finance search process. Internal capital rationing was mentioned by 13%

of these respondents and external rationing by only 7%. This observation further suggests that external rationing was not a major feature of the farm sector financial structure in late 1970.

8.8 Reasons for Not Borrowing

The reasons for not borrowing (Table 8.8) were very similar to those listed above. (Table 8.4).

Table 8.8

Spontaneous Reasons for Not Borrowing (% of Non-Borrowers - 138)

Finance expenditure from income	81
In sufficient debt already	17
Doing work ourselves	13
Pessimistic about future state of farming	9
Can't borrow any more	1
Other	11

Only 1% of "non-borrowers" indicated that they had reached external capital rationing limits, whereas 17% had reached a level of internal rationing. This distribution was significantly related (at the 5% level) to both age of operator and equity, e.g. 24% of "non-borrowers" in quartile one made this comment but no respondent in quartile four did.

A macro-relationship between building work and income has been observed (1.4) and survey results support the validity of this result. A number of respondents mentioned that they would be carrying out the building work with existing business resources, and therefore had no need to borrow. Older farmers were more likely to make this comment, but their projects were more often of an extension-type nature (8.6).

Only 9% of non-borrowers indicated that pessimism was a factor and in all cases these were sheep farmers. It is likely that this result underestimates the real effect of confidence as a necessary stimulant to borrowing.

(c) Improvement and Development Work

8.9 Future Needs

There were practical difficulties in isolating and defining this capital expenditure, and Johnson's list of "improvements and development" work was used⁶ as a basis. In many cases this capital-type work would be indistinguishable from regular operations of the business. For tax purposes much capital development work is allowed as a current charge against profits. It is therefore unlikely that farmers

⁶ Johnson⁽¹¹⁴⁾, p. 10.

themselves make subtle distinctions between capital and maintenance development work.

All respondents were asked to study a showcard listing Johnson's "improvement and development" items and were asked:

- (i) "Have you spent any money on any of these items in the past 12 months?"
- (ii) "Do you plan to carry out any work of this sort in the coming 12 months?" (Table 8.9).

Table 8.9

Improvement and Development Type Work, Proposed and Completed
(% of Respondents - 368)

<u>Item</u>	<u>Carried Out</u> (y/e Nov/Dec 1970)	<u>Proposed</u> (y/e Nov/Dec 1971)
Development of virgin land/ scrub cutting etc.	27	26
Pasture replacement	57	53
Lucerne replanting/new planting	12	11
Plantation replanting/new planting	11	13
Orchard replanting/new planting	5	4
Irrigation/drainage work	20	22
Construction of landing strips/access roads	9	5
Purchase and siting of tanks and troughs	26	24
Purchase and erection of new fencing	70	68
None of these items	7	8

There were no significant differences between numbers carrying out each item of work, ex-post and ex-ante. Items were examined to determine relationships with analytical parameters. There were significant relationships between both age of operator and equity (as measured on the quartile basis) and ex-post and ex-ante expenditure of virgin land development. If the life cycle thesis is valid, the properties of younger farmers, with lower observed equities (Table 3.7), might be expected to be in a less developed state than the subjectively maturer properties of older farmers. Ex-post expenditure on tanks and troughs was also significantly related to equity. Lower equity respondents were more likely to have completed this work.

Ex-post and ex-ante expenditure on irrigation/drainage type work and on tanks and troughs was a significant feature of dairy rather than sheep type units. Significantly more sheep farmers had completed and planned further expenditure on virgin land development work, pasture replacement and construction of access roads and landing strips. These differences are a result essentially of environment and of the particular physical needs of sheep and dairy type businesses. No other significant observations were made, though for all items expenditure was a feature of younger rather than older respondents.

8.10 Attitude to Borrowing

Significantly more respondents, 35% of those with proposed development type plans, indicated their willingness to borrow, than for plant or building purposes. A summary of parameters of borrowers and non-borrowers (Table 8.10) confirms previous conclusions (8.4, 8.7). The propensity to borrow for development work is higher for a younger farmer with a weaker equity and liquidity than for an older farmer in a stronger financial position. For instance, 59% of respondents with ex-ante development needs in the 21-30 age group would consider borrowing to finance proposed work, compared with only 10% in the over 60 group. Borrowers were also operating significantly larger businesses than non-borrowers.

Table 8.10

Mean Parameters of "Borrowers" and "Non-Borrowers"
(Improvement and Development Type Work)

<u>Parameter</u>	<u>"Borrowers"</u>	<u>"Non-borrowers"</u>	<u>Signif. diff.</u> (t-test)
Farm business assets (\$)	100,360	83,417	1%
Mortgage debt o/s (\$)	26,424	15,702	1%
Short term debt o/s (\$)	8,261	3,902	1%
Equity (%)	60	74	1%
Liquidity Ratio	0.9	2.0	
Sample Nos.	128	211	

The need for plant or buildings at an instant of time can be envisaged as a stock observation. If a need was evident at interview date, and willingness to borrow determined, then the question "Can you say why you haven't borrowed already?" was meaningful. The need to carry out development type work is essentially a flow observation, and this question may therefore not be logical. This is because development needs are likely to be related to dynamic organisational variables, such as seasonal factors. The question was still put to prospective borrowers, and results highlighted this time factor (Table 8.11).

Table 8.11

Spontaneous Reasons for Not Borrowing Already
(% of Borrowers - 128)

Plans not yet executed	46
Already borrowing	30
In sufficient debt already	7
Trying to arrange finance	4
Can't obtain finance	2
Other	23

The question structure enabled probing to determine the extent of borrowing restrictions. Only a small number of "borrowers" indicated external or internal restrictions, and this supports previous observations. The number "already borrowing" confirms the observation that bank and stock firm overdrafts are used for this purpose (Tables 5.12, 6.12).

8.11 Reasons for Not Borrowing

Nearly 65% of respondents with development needs indicated that they would not borrow to finance the work. The reasons (Table 8.12), are compatible with earlier results. (Tables 8.4, 8.8).

Table 8.12

Spontaneous Reasons for Not Borrowing
(% of Non-Borrowers - 211)

Finance expenditure from income	72
Pessimistic about future state of farming	19
Normal farm work	13
In sufficient debt already	9
Can't borrow any more	2
Other	16

A lower proportion of respondents mentioned the income and internal rationing factors than for plant and building needs. There was an increase in numbers mentioning the pessimism factor which was a feature of sheep rather than dairy farmers. This data supports the commonly held belief that improvement and development type work is a volatile component of farm capital expenditure, extremely susceptible to confidence changes.

There was a feeling amongst 13% of non-borrowers that listed development items were normal farm work, and were therefore financed internally. It may be that these respondents confused borrowing particularly for minor

development work with borrowing for working capital, but probing was not attempted. Internal capital rationing was a feature of operators in weaker liquidity positions and earning lower rates of return, but hypotheses were not supported by testing. External capital rationing, according to farmers themselves, was a minor explanatory factor.

(d) Home Capital Expenditure

8.12 Future Needs

The farm-home expenditure conflict has been investigated by researchers, Heady et. al.,⁽⁹⁷⁾ Maddox and Chastain⁽¹²⁷⁾, and it was felt essential to briefly examine this conflict in interview. Capital sums needed to be spent in the home by 43% of all respondents, with a significantly greater need exhibited by lower equity farmers. The modal need was for home repairs, but as it was difficult in practice to isolate "capital" and "maintenance" components, responses were recorded verbatim (Table 8.13).

Table 8.13

Home Needs Listed By Respondents
 (% of Respondents - 159)

Repairs to house	74
Extension to house	14
Erection of new house	14
Major furniture/fittings	4
Other	3

There were no other observed relationships with analytical parameters, but these parameters may not be ideal for an investigation into home expenditure.

The planning horizons for this work appeared to be short as 63% of respondents with needs indicated that the work would be completed within a year of interview date. From interviewers' reports, the effect of the presence of wives at some interviews is likely to bias this result upwards.

8.13 The Conflict Problem

To determine the extent of the allocation problem the question was phrased:

"Do you ever find that there is a need for money to be spent on the home and at the same time on the farm?"

Prior evidence from an American study⁷ suggested

⁷ Nelson and Murray⁽⁴⁰⁾, Table 4.1, p. 27.

that the problem was associated with age of operator. Survey results supported this conclusion as there was a significant relationship between positive response and equity quartile. Whilst 80% of all Survey respondents reported experience of the problem, only 25% of the over 60 age group gave a positive response. The allocation problem was a particular feature of middle aged operators. It is suggested that young farmers have no effective choice as the hypothesised goal structure demands that money be spent on the farm, and older farmers have been observed to have a relatively greater volume of surplus funds (Table 3.7).

The 294 respondents who had experienced the problem were asked how this was normally resolved. Resources were always diverted to the farm by 62%, always to the home by 1% and 37% did not know or answered "sometimes one - sometimes the other". Evidence suggested that lower equity farmers were more likely to divert all resources to the farm, but this hypothesis was not supported by testing. The small group who always diverted resources to the home were all over 60 years of age.

8.14 Attitude to Borrowing

A solution to the problem might be borrowing in order to satisfy dual needs. Respondents who have experienced the allocation problem were asked:

"Would you ever borrow if such circumstances arose again?"

Response level would give an indication of the propensity to borrow for home purposes and 35% of respondents answered positively. Prospective borrowers were observed to be carrying a heavier debt load than non-borrowers (Table 8.14).

Table 8.14

Mean Parameters of "Borrowers" and "Non-Borrowers"
(Home Capital Expenditure)

<u>Parameter</u>	<u>"Borrowers"</u>	<u>"Non-Borrowers"</u>	<u>Signif. diff.</u> (t-test)
Farm business assets (\$)	92,411	87,177	
Mortgage debt o/s (\$)	27,585	22,752	
Short term debt o/s (\$)	7,037	5,116	1%
Equity (%)	63	71	
Liquidity Ratio	1.2	1.6	
Sample Nos.*	103	176	

* total less than 294, as 15 respondents answered "don't know".

"Borrowers" were observed to be in a weaker relative liquidity position and tended to be younger. Similar observations have been made (e.g. Table 8.10) in relation to farm expenditure.

8.15 Reasons for Not Borrowing

It was hypothesised that for a large number of farmers an allocation problem would not exist in practice, since funds would tend to be channelled into the farm business. The reasons given for not borrowing for home expenditure (Table 8.15) confirmed the thesis that the home was a residual funds outlet. Many respondents felt that they could "get by on their present home set-up" without recourse to borrowing.

Table 8.15

Spontaneous Reasons for Not Borrowing (% of Respondents - 172)

Can "get by on present set up"	51
Money always spent on farm	50
In sufficient debt already	7
Can't borrow any more	1
Other	15

Significantly more dairy than sheep farmers confirmed that the farm business was a funds priority. On the other hand significantly more dairy farmers mentioned that they could "get by...". A proportion of respondents mentioned that they had reached their internal borrowing limits and a smaller proportion had reached external limits. These results are consistent with earlier observations.

8.16 Summary

Items of farm capital expenditure have been examined in relation to their need in the business and the willingness of operators to borrow for acquisition. The study has shown that:

- (i) Farmers prefer in the first instance to finance capital expenditure from income rather than from borrowing, (Tables 8.4, 8.8, 8.12);
- (ii) Few farmers have reached the limits of external capital rationing. Slightly more have reached the limits of internal rationing (8.5, 8.8, 8.11, 8.15);
- (iii) Confidence is a contributory factor in farmers' propensity to borrow (8.5, 8.8, 8.11);
- (iv) Prospective "borrowers" are more likely to be operating larger businesses and carrying a higher debt load than "non-borrowers" (Tables 8.2, 8.6, 8.10, 8.14). They are likely to be in a weaker equity and liquidity position than non-borrowers. Age of operator is a major factor in the propensity to borrow (8.4, 8.7, 8.10);

- (v) Expenditure on the home is of secondary importance to expenditure on the farm (8.13, 8.15).

These conclusions have not been quantified but do provide a basis for future quantitative research.

CHAPTER NINE The Farm Credit Survey - Relevance
to Considered Theory

9.1 Introduction

Chapter Nine represents a summary discussion of the Survey results and relates findings to the multi-goal hypothesis formulated in Chapter Two. This data adds substantial support to the life cycle thesis as an inbuilt feature of New Zealand agriculture. Implicit in the design of the Survey was the need to assess the extent of debt aversion and credit gap operating within the farm sector. (See Introduction). The contribution of collected data to an explanation of these phenomena are discussed in 9.8 and 9.9 respectively. Some implications of the Survey results are mentioned, but these are partial as they have arisen as a result of a "demand" approach to the farm credit market. Policy considerations resulting from the interaction of observed demand-supply phenomena are discussed in Part Four. Simple arithmetic and algebraic models are utilised to complement this exposition.

9.2 The Ownership Goal

A basic hypothesis was that an older farmer anticipated a higher U_c than a younger farmer (2.8). Direct utility measurement was not attempted (2.3) but survey data indirectly

supported this formulated thesis. This was through a "revealed preference" type observation of actual behaviour.

From Table 3.7, there was a close relationship between equity and age of operator. Older farmers were observed to be carrying a significantly **lighter** mortgage debt load than younger farmers in terms of dollar volume (4.2) and number of securities (Table 4.5). Older farmers were also in a relatively stronger liquidity position (Table 3.7). In addition, the importance of and **use made of the credit facilities** offered by trading banks and stock firms was an observable function of age (for example, see 5.4, 5.9, 6.4). The hypothesis that disutility (expressed through criticism of credit facilities and institutions) was likely to decrease as maximum U_c approached was not supported by statistical testing of response distributions. However, non-significant observations were made (4.7, 5.12, 6.9) that younger farmers were more likely to be experiencing borrowing problems and have criticisms of their financial sources.

The hypothesised relationship between ex-ante propensity to borrow and age of operator (2.8) was supported by the data. The propensity for ex-ante term borrowing was significantly related to age of operator and equity (4.8). The explanations of decisions not to incur additional term debt (4.9) stress the role of age and "satisfaction" with the status quo. The propensity to borrow to finance projects (8.2, 8.6, 8.10, 8.14) was also significantly related to age of operator.

The changing relevance of the ownership goal is therefore indirectly supported by this data. It has a number of implications with respect to production and the efficiency of national resource use:-

- (i) the age structure of the farm operator population will influence the aggregate propensity to borrow. The farm sector propensity to borrow, F , can be expressed

$$F = \underline{A} \underline{B} - (1)$$

Where \underline{A} is the column vector representing the age distribution of farm operators; \underline{B} the row vector representing the average propensity to borrow within each age group.¹ From identity (1) above, an ageing farm population (from 3.3, the mean age of decision makers in December 1970 was 46) will ceteris paribus reduce the average propensity to borrow. This is likely to affect production levels;

- (ii) the general level of farm sector education was observed to be below that of the non-farm sector (3.3). There was also evidence that operators with no debt load were less active users of management techniques and extension services than operators with a debt load (Table 4.3). On the unproven assumption that use of management

¹ This identity and the "propensity to borrow" concept are further discussed in Chapter 16.

techniques and advice stimulates internal efficiency, the suggestion is that a debt load acts as an indirect production incentive by fostering use of extension services. The use of extension services is unlikely to be as acute for operators who have attained maximum U_c ;

- (iii) the ownership goal has been a traditional feature of the New Zealand farm sector. Despite comparatively low direct returns on assets employed (3.7) the desire for ownership is strong both for itself, and for the expectation of capital gain type income;
- (iv) low interest rates were observed to be major attractions of ex-post and ex-ante borrowing sources (Tables 4.16, 4.21). The level of interest rates was a major criticism of stock firm lending (Table 6.14). The nature of implicit responses suggests that the farm sector believes concessional interest rates to be a permanent inbuilt feature of its financial structure and as a means of achieving its ownership goal.

Some arithmetical implications are considered further in Part Four.

9.3 The Growth Goal

The listed theoretical conditions for growth "take-off" (2.9) were excess managerial capacity, satisfactory initial profitability, minimum starting size, unused resources and the availability of external finance. Survey results allow some observations on the validity of those conditions to be made. There was no evidence to suggest that prospective term borrowers whose businesses might be expected to grow at a faster rate, were earning higher returns than non-borrowers at present. There were no significant differences between the mean gross and net profits, rates of return on sales and assets (3.6, 3.7) and likelihood of future borrowing (4.8). Dairy farmers were observed to be earning higher rates of return than sheep farmers (3.9) though there was no significant difference in their future propensity to borrow. Similarly there was no significant difference between size of business and prospect of future term borrowing.

The availability of external funds emerged as an important factor in both the ex-post (4.6) and ex-ante borrowing decision. Aggregate survey results suggested that farmers themselves did not believe that there was a shortage of external funds (9.9) and only in a few cases did external rationing inhibit growth (Table 4.19). Income was observed to be a far more significant determinant of investment, and therefore growth. Survey results are however neutral in the support of the aggregate listed/growth "take-off" conditions.

Field investigation confirmed a number of formulated hypotheses (2.9). Investment in the home was observed to assume a lower priority than on-farm investment (8.13), and the majority of farmers were not prepared to borrow for home capital expenditure (8.15). Current users of credit facilities and prospective borrowers were identifiable (see 2.9 for hypothesis). Borrowers were younger, in weaker financial positions and tended to have larger businesses than non-borrowers. From cross section data rates of return earned by borrowers were not however significantly different from non-borrowers.

The hypothesis was also formulated (2.9) that when actual growth rate deviated from subjectively optimal growth rate there would be prima facie evidence of external capital rationing. Little evidence of external capital rationing arose from Survey results and internal rationing was more likely to be the "norm". This result supports Hesses's⁽¹⁰¹⁾ similar conclusion from an American field study. The implication is therefore that for the farm sector in toto, actual rate of growth is broadly equivalent to subjective optimal rate of growth. Growth is restricted by farm operators' attitude to risk, managerial deficiencies and the effect of the ownership goal.

9.4 Profit Utility

The formulated hypothesis (2.10) was that U_p would rise and subsequently fall as the life cycle evolved.

Absolute net profit and business drawings were observed to rise and fall with the age of farm operator (Table 3.7). However there were no significant differences between the respective percentages of both net profit and drawings to total assets employed, within each age group (Table 9.1). Such a difference might be anticipated as a result of changes in internal efficiency and the U_p structure. A further observation was that there was no significant difference between the average propensity to withdraw cash from the farm business, (in relation to profits earned), according to age of operator. Recorded data is however conceptually imperfect and the implication is that the changing U_p goal is neither supported nor refuted by the evidence.

Table 9.1

Percentages of Net Profit and Drawings
to Business Assets Employed, Classified According
to Age of Operator

Age Group	<u>21-30</u>	<u>31-40</u>	<u>41-50</u>	<u>51-60</u>	<u>61-</u>	<u>ALL</u>
N. Profit/Total Assets	3.9	4.3	4.8	5.5	4.7	4.7
Drawings/ " "	2.9	3.3	3.5	3.6	3.2	3.4
Drawings/Net Profit	72.3	75.6	71.7	63.4	68.7	70.0
Sample size	29	92	115	92	39	368*

* includes one operator of less than 20 years.

9.5 Institutional Utility

Very little criticism was forthcoming from interview of the sources of mortgage finance (4.7). Reputation of source was an ex-post choice factor (Table 4.16), though it was relatively minor compared with the funds availability consideration. For prospective borrowers a search for new financial sources was related to the "once only" characteristic of present sources (Table 4.20), and did not reflect widespread dissatisfaction with current sources of term finance.

Tradition emerged as the major trading bank and stock firm choice factor (5.3, 6.3), and the ex-post and ex-ante transfer rates were low (e.g. 5.5, 5.6). The influence of tradition has meant that many customers have developed a stable relationship with their institutions. On the other hand, all offer fundamentally the same service and 'optimal' choice may not be a very meaningful concept. The implication of observations is that the farm sector is "happy" with its institutional choices or that U_{IS} is an unimportant component of Total Utility.

Results showed that institutional preference was strong at the limit for respondents operating either a trading bank or a stock firm account (5.15, 6.13). There was some evidence of split business, but dairy farmers were observed to borrow predominantly from trading banks and sheep farmers predominantly from stock firms (Table 5.12).

This is essentially a result of the particular services offered by these institutions to the farm types.

9.6 Sheep and Dairy Farmers

The observations have been made in Chapter Three that the mean equity of dairy type businesses was significantly lower than that of sheep type businesses, but that rates of return were higher in the dairy farm sector (3.9). The debt structure of these two farm types (Table 3.8) indicates that:-

- (i) a higher proportion of the debt stock on sheep type businesses is for land purchase than for directly productive assets;
- (ii) a higher proportion of the debt stock of dairy farmers is on a long term basis.

Ceteris paribus, the debt stock of average dairy type businesses is on a sounder basis than sheep type businesses. This conclusion was not reflected by observable criticism and complaint, and factors not investigated (e.g. the effect of drought in influencing short term debt levels) may have contributed to recorded debt structure.

There were few significant differences between the response distributions of sheep and dairy farmers in the investigation, with the exception of use made of stock farm facilities. The conclusion is that farmers in general have similar attitudes to and experience of the market, and it would therefore be legitimate to use single parameters to represent the farm sector (e.g. the propensity to borrow) in models, rather than resort to sub-sector parameters related to farm type. It is important to remember however that the Survey represents a static cross-section rather than a dynamic expression of attitude and experience. The farm sector environment is dynamic and changes since December 1970, such as a falling lamb price schedule, may not support the above conclusion.

9.7 The Life Cycle Thesis

Evidence has arisen from the Survey to support the life cycle thesis as implicitly formulated in Chapter Two. This evidence is not repeated but conclusions are that:-

- (i) farm sector operators do have multiple changing goals;
- (ii) in particular, growth and profits are predominant goals of younger farmers, and ownership and financial security are major goals of older farmers;

- (iii) the effect of this changing goal structure has implications for farm sector output maximisation and credit needs (Chapter 16).

9.8 The Aversion to Debt

The aversion to debt concept was mentioned in the Introduction as being a central one to the investigation. Observations were that:-

- (i) nearly two-thirds of the sample considered it unlikely that they would be borrowing term finance in the foreseeable future (Table 4.18). Reasons given for this decision (Table 4.19) were related to the changing goal structure. Only 12% of future non-borrowers, or 3% of the total sample indicated that they "did not like being in debt";
- (ii) a small proportion of short term borrowers indicated that they "tried not to go into overdraft". (Tables 5.11, 6.12);
- (iii) there was a reluctance to incur additional debt for project type purposes (Chapter Eight). This was related to age of operator and by implication the changing goal structure. Direct economic factors such as lack of confidence also inhibited the propensity to borrow.

From field observation, a moral aversion to borrowing as such is probably experienced by under 5% of the total farm population and a marked reluctance to borrow by about 20%. The strong effect of the goal structure is likely to inhibit borrowing for major capital purposes by about 40% of the farm population and though this represents an aversion it is not moralistic in nature. The residual, about 35% of the population, are likely to be the most active borrowers at any instant of time.

This small proportion of active borrowers and the prevalence of debt aversion even in minor form does have policy implications in that output is, *ceteris paribus*, likely to be restricted. On the other hand debt aversion is a particular feature of older farmers who are likely to have a lower labour productivity than younger operators. Similarly an increasing farm sector average propensity to borrow will influence aggregate funds allocation in the economy and will have implications for overall resource efficiency.

The overall conclusion is therefore that debt aversion is a feature of the farm sector but is related primarily to observable goal structure dynamism rather than moralistic ethics.

9.9 The Farm Sector Credit Gap

Survey results do not suggest that there is a shortage of term finance experienced by operators within the farm sector. This is evidenced by:-

- (i) a limited search process (4.5) for ex-post finance, though search was increasingly an aspect of younger operators' behaviour;
- (ii) few "limitation" criticisms of sources of mortgage finance (e.g. "high security required", "not enough money lent") were observed (Table 4.17);
- (iii) ex-post finance limitations were not major factors inducing an ex-ante change (Table 4.20).

The investigation was however confined to farmers already operating within the sector. A credit gap may have been experienced by actors unable to achieve market entry. The Agricultural Production Council has disagreed with the above conclusion and believes that for all "farmers", (i.e. market actors and prospective actors).

"... the availability of long term finance is becoming a problem of real concern..."²

Survey evidence also does not support the thesis that farm operators are experiencing a shortage of short term finance. Evidence collected showed that:-

- (i) there were few "limitation" problems experienced in the use of trading bank and stock firm credit facilities (Tables 5.13, 6.14);
- (ii) the role of trading bank and stock firm overdraft limits were observed to be flexible. There was no evidence of undue restriction which would have consequent adverse effects on the business structure (5.13, 6.10);
- (iii) the small number of requests for overdraft reduction or refusal were not observed to have adverse effects on the farm business structure (5.14, 6.11);
- (iv) the request for stock firm security did not appear to have adverse effects on the business structure (6.12).

In addition, study of the propensity to borrow for project type purposes (Chapter Eight) showed that anticipated borrowing restrictions are internal rather than external in origin.

The overall conclusion is therefore that there is limited evidence of a credit gap or effective external capital rationing restricting the operations of farmers. Limitations are

largely internal and relate to the changing goal structure. The implications are that:-

- (i) farmers are obtaining the funds they require to operate their businesses in accordance with their goal structures;
- (ii) additional borrowing by the farm sector would not be immediately restricted by external capital rationing, and would be likely to increase aggregate output given the leverage effect of borrowing on farm performance (2.9).

PART THREECHAPTER TENTHEORY OF THE EFFICIENT MARKET10.1 Introduction

The aims of Part Three are to:

- (i) examine the factors affecting the flow and distribution of loanable funds both to and within the farm sector from three selected institutions. This represents a discussion of the supply aspects of farm credit and is made in the context of the economic market;
- (ii) to qualitatively assess the efficiency of this flow of funds both to and within the farm sector. This is made through consideration of marginal cost pricing, and the opportunity costs of resource allocation.

To provide a framework for the investigation the concept of economic "efficiency" is discussed, and a set of criteria prepared as a basis for field investigation.

(A) Considered Theory10.2 The Concept

Dorfman^(18 p. 126) defines an economic system as efficient if there is:

- (i) an efficient allocation of goods produced (the output mix);
- (ii) an efficient allocation of resources in the production of these goods (the input mix);
- (iii) an efficient allocation of goods produced amongst consumers.

Dorfman does not indicate if his definition is static or dynamic, and it is not clear whether he refers to technical, economic or welfare efficiency. Scitovsky¹ discusses these concepts and concludes that a system will be economically inefficient at any instant of time if any other distribution of resources would increase total output or reduce total costs. The fine distinction between economic and technical efficiency is not stressed, but

¹ Scitovsky, T., The Economics of a Fully Developed Economy. London: Allen and Unwin, 1952. Ch. 8., p. 148.

Scitovsky's description is not welfare in concept since this would imply distribution according to welfare criteria. The concept of cost assumes a major role in the economic definition. In Leftwich's^(33 p. 136) terminology, cost may be interpreted as:

- (i) "explicit" cost, referring to visible expenses actually paid out to factors. This definition is the basis of the marginal approach to efficiency, or;
- (ii) "implicit" cost, referring to the cost of opportunities foregone. This is the basis of the opportunity cost approach to efficiency.

10.3 Conditions for Maximum Efficiency

Maximum efficiency, where both buyers and sellers are in a state of equilibrium, is only attainable in a perfectly competitive economic system. The relevant features of this system are that:

- (i) economic resources are scarce, and the price system is allowed to assume the prime allocative role;
- (ii) there are many buyers and sellers such that none can manipulate the market price;

- (iii) there is product homogeneity so that buyers will be neutral towards sellers;
- (iv) there is freedom of entry to and exit from the market;
- (v) there is perfect information available and actively utilised by market actors;
- (vi) all market actors are rational and follow a goal of profit maximisation. This collective action will maximise market efficiency;
- (vii) the internal efficiency of similar resources is neutral;
- (viii) the long run flow of resources is unimpeded. Resources will be diverted where returns are greatest and/or where costs are cheapest;
- (ix) the market is not subject to external interference (e.g. government behaviour is assumed to be neutral).

In the simple case of a firm utilising two factors of production, A and B, and producing one final product, X, long run equilibrium and maximum economic efficiency is defined by the relationships:

$$(i) \quad \frac{MPP_A}{P_A} = \frac{MPP_B}{P_B} = \frac{1}{MC_X}$$

$$(ii) \quad MC_X = AC_X = MR_X = P_X$$

$$(iii) \quad \frac{P_A}{MPP_A} = \frac{P_B}{MPP_B} = MC_X = AC_X = MR_X = P_X$$

where, MPP_A = the contribution of a unit change in factor A, given factor B, towards the output of X

MC_X = cost of producing X at the intensive margin of production

AC_X = average cost of producing X

MR_X = revenue received from selling X at the intensive level of output

P_X = price of X on the open market to cover cost and normal profit.

Equation (i) equates the marginal rate of substitution between factors (indicated by the slope of production isoquants), with the cost ratio (the slope of the isocost line). Production is at the minimum cost, and this equation is an expression of the opportunity cost approach to resource allocation (10.2).

Equation (ii) shows that production is at a point where marginal cost, average cost and marginal revenue are equal, and equation (iii) the full equilibrium situation. This is the state of maximum efficiency, and in general will allocate resources to

the factor and product markets to maximise net national product in the long run. The assumptions of perfect competition (10.3) do not preclude misallocation in the short term.

10.4 Deviations from Efficiency - Market Structure

If in the applied investigation lending institutions and farm businesses were operating in the perfect environment, then the distribution of loanable funds both to and within the farm sector would in the long run automatically be efficient.

A priori observation suggests that these market actors are not operating in the perfect market. Other forms of market structure are in evidence and these structures will influence the efficiency of resource allocation. However the perfect market is a basic concept as it provides a standard of efficiency against which the conduct of economic institutions can be appraised. Two theoretical imperfect market structures are briefly discussed:

(a) Oligopolistic Market

Four predominant features of this market type are discussed by Grayson:²

² Grayson, H. Price Theory in a Changing Economy, New York: Macmillan and Co., 1965, p. 90.

- (i) there are a few large firms each holding an appreciable market share;
- (ii) there is product homogeneity;
- (iii) there is ignorance on the part of buyers;
- (iv) there is restricted market entry.

As a result of these features, price is not necessarily equated to marginal cost and is affected by demand elasticity. Since demand elasticity is not a static variable, market differentiation and therefore inefficiency may occur.

The oligopolist is generally assumed to buy resources competitively (and therefore face a cost structure similar to a perfect competitor) and operate under a profit maximising (or loss minimising) goal. A number of oligopoly market models have been developed by theorists (Naylor and Vernon (39 p. 49)). These are of three main types - organised and collusive, unorganised and collusive, and unorganised and non-collusive. In all these cases the demand curve faced by the oligopolist is influenced by the market activities of other firms and in the limit this is reflected by the kinked-demand curve model. As a result, non-price competition and seller communication are likely to be observable market features.

Inefficiency is a feature of the oligopoly market structure. There is no automatic tendency for sellers to operate at the optimum scale or level of technical efficiency. In the collusion model, output will depend on factors such as quotas and market arrangements, and price may be predetermined. As a result a restricted output is likely which is sold at a price greater than marginal revenue. In these circumstances excess profit will occur. There is also no tendency for prices to be related to average cost, since market entry is by definition restricted as a result of factors such as scale economies and the legal effects of franchises and patents. However, the optimum position of the oligopolist is still to operate in both the short and long term at the level where marginal cost equates with marginal revenue.

The effect of an oligopolistic market structure on efficient resource allocation can be envisaged as consisting of:

- (i) the deviation from the perfect market structure (10.3) i.e. the extent of oligopoly;
- (ii) the deviation from perfect pricing conditions i.e. the deviation of price from average cost and marginal revenue.

(b) Competitive Monopolistic Market

Four basic characteristics of this market structure are that:

- (i) the market can be divided into small separate segments;
- (ii) there is differentiation (real or induced) of individual producers' output;
- (iii) there is ignorance on the part of buyers;
- (iv) there is partially restricted market entry.

Under this market structure, market efficiency is not assured as there is no tendency for firms to operate at the point where marginal revenue equals price. Excess profits are likely to be made but in the long run the less restrictive market entry requirements will ensure that price equals average total costs, as firms are forced to incur expenditure on product differentiation.

Long run equilibrium in the firm will be at the point where marginal cost equals marginal revenue. The effect of a monopolistic competitive structure on the efficiency of resource allocation is therefore determined by:

- (i) the deviation from the perfect market structure;

- (ii) the deviation from perfect pricing conditions, i.e. the extent of the price-marginal revenue differential.

It is likely that features of both imperfect and monopolistic market structures will be evident in field investigation. These market types are similar and the optimum level of output under both market conditions is determined where marginal cost equals marginal revenue. This observation has pricing corollaries, given the deviation from the perfect market structure.³ These can be stated as efficiency standards against which to assess actual pricing techniques.

- (i) for the same commodity, prices charged to all customers should be equal;
- (ii) separate prices should be charged for "optional" services;
- (iii) two or more prices should be charged to cover the marginal cost of a commodity having semi-fixed marginal costs;
- (iv) prices should vary with marginal cost, if this is subject to cycles;
- (v) price stabilisation is inefficient.

These criteria are investigated under market conditions.

³ For theoretical discussion of these corollaries see Beckwith (8) p. 184.

(B) Extension of Theory10.5 Assumptions in Analysis

In subsequent discussion (10.6 - 10.9) considered theory and empirically observed phenomena are discussed in relation to the particular circumstances of the farm credit market in New Zealand, and the need to develop a set of efficiency criteria (10.1). The analysis is based on eight underlying assumptions. These are that:

- (i) the credit market is consistent with features of any theoretical market, and loanable funds is a specific definition of a market commodity;
- (ii) society believes efficient resource allocation to be achieved primarily through the price mechanism. Welfare is taken to be a secondary motive;
- (iii) financial and quasi-financial institutions perform the input-output function of the theoretical firm;
- (iv) the economy is dynamic and therefore the demand for funds from different sectors will change over time;
- (v) resources (i.e. loanable funds) should be free to flow to their most profitable use;

- (vi) the farm sector should not on efficiency grounds, have claim to special treatment in the market⁴ (e.g. preferential interest rates) and ceteris paribus should compete for funds on the same basis as other sectors;
- (vii) the goal of financial institutions is profit maximisation. Since marginal revenue to an institution represents marginal cost to a borrower, the implication is that the goal of borrowers is also profit maximisation. This has been shown to be one of several in the farm sector. However to relax this goal at the outset for all sectors would require considerable rewriting of efficiency theory in the market context, since unique marginal identification would not be possible. For simplicity in theoretical discussion, the assumption of borrower profit maximisation is maintained;
- (viii) to achieve this goal, institutions allocate funds to the farm sector in a two stage process, i.e. initial allocation to the farm sector in competition with other sectors, and subsequently funds allocation within the sector.

⁴ For further discussion of this viewpoint see Coombs⁽⁷⁶⁾.

Given these assumptions three sources of funds to the farm sector are considered. These are the trading banks (10.6), the stock and station agents (10.8) and the State Advances Corporation (10.9).

10.6 Trading Banks - Introduction

The major "input" of trading banks consists of deposit funds (i.e. current and term deposits) and the "production process" combines this input with other factors such as skilled labour, to produce an "output", loanable funds. It is assumed that loanable funds are a different commodity from borrowed funds. For instance, loanable funds may be generated as a result of the "credit creation" ability of trading banks.

Use of this analogy with the firm suggests that the "price" of loanable funds is the rate of interest charged and the "cost" of making a loan will consist of;

- (i) the direct cost of loanable funds, i.e. interest paid on deposit account balances, and service costs of retaining current account balances from alternative uses;
- (ii) the direct incidental cost of making a loan, i.e., the cost of servicing, control, advice, and all costs relating to credit quality;

(iii) the "cost" of the risk factor. The presence of risk refutes condition (v) of the efficient market (10.3).

Components (i) to (iii) above are the basis for the "marginal" approach to costing. The essence of this approach is that the marginal cost of making a loan should exclude any fixed cost component such as the rent for bank premises. It can be argued that in the bank's allocation of loanable funds the cost of attracting these funds, (i) above, represents a fixed cost and should not be included in the costing. As there is likely to be ^{and} some relationship between deposit/loanable funds, the cost of attracting and retaining deposits is variable in concept and therefore relevant. The cost of making a loan can also be considered in the opportunity cost context (10.2). Tobin⁵ has discussed the opportunity cost approach in the commercial bank context. For example, he considers that an implicit cost of making a loan is to reduce the yield on current bank bonds and stock. This is a result of an outflow of funds to investing financial institutions who may consequently bid up bond prices.

⁵ Tobin, J., "Commercial Banks as Creators of Money" pps. 408-419, in Deane Carson (ed.), Banking and Monetary Studies, Homewood Illinois: Richard D. Irwin Inc., 1963.

Use of either of these approaches suggests that the cost of a loan will vary according to its time horizon, risk and other factors such as spatial location of the borrower. The "non-interest" costs of making a loan are likely to be independent of the size of the loan but according to Freimer and Gordon⁽⁹⁰⁾, will tend to increase with it. The implication is that differences in the price of a similar dollar loan do not necessarily imply discrimination since the cost-revenue equality at the margin is a necessary efficiency condition. On the other hand discriminatory prices are an inefficient method of allocating loanable funds. Dahl⁽⁷⁹⁾ suggests that an ideal and efficient loan pricing procedure is to charge a single interest rate on all dollar equivalent loans supplemented by a separate service fee. In this way both trading banks and borrowers are better able to identify costs and returns at the margin.

Dahl does not give extensive consideration to the risk concept and this is a cost to be assessed at the margin. Hodgman⁽¹⁰⁵⁾ has carried out pioneer work on the effect of risk as an influence on funds rationing, through its discounting effect on marginal revenue, rather than its cost effect. A similar approach has been adopted by Lindner⁽¹⁸⁹⁾ who has developed an "effective yield" formula to determine "real" marginal revenue resulting from a loan. Lindner's formula has been slightly modified but in general states that:

$$j = E(i) / \left\{ 1 + c \cdot \frac{E(y) + E(x)}{a} \right\} \quad (1)$$

Where j = the effective yield on a loan excluding any service fee component and representing marginal revenue less an allowance for the risk factor.

$E(i)$ = the expected yield on a loan with no allowance made for risk, i.e. simple rate of interest.

c = the individual preference of a lender for yield versus risk aversion. A value of one implies neutrality, a value of greater than one a preference for risk aversion, and a value of zero a riskless loan. The value of c is likely to depend on the extent of market knowledge. (11.4).

$E(y)/a$ = an estimate of the mean risk attached to the loan, per dollar loaned, where a represents dollar size of loan. The estimate of risk of principal or interest loss and its variance, is likely to increase with loan size, i.e. $\Delta E(y) > \Delta a$, for all a . The estimate will depend on the estimate of the borrower's ability to repay.

$E(x)/a$ = a residual balance, based on the notion that as loan size increases the cost of not diverting resources to other uses will increase. This is an opportunity cost concept, and inconsistent with the direct marginal approach to allocation.

If the effect of risk alone can bring about funds allocation on the basis of equal opportunity cost then this variable will be zero.

From equation (1) above, the influence of risk on loanable funds allocation is two-fold:

- (i) risk reduces nominal marginal revenue from a particular loan or alternatively increases the effective cost;
- (ii) the effect of the discounting factor will limit the size of the loan, as it is likely to increase at a faster rate than the dollar value of the loan.

To retain marginal equilibrium in the dynamic context, risk must be quantitatively assessed. Cordes⁽⁷⁷⁾ has suggested from a study of successful and unsuccessful bank loans to farmers that net worth, total assets and total debts are critical factors in determining loan success. The practical effect of uncertainty is that bankers are unsure of their mean estimates of the future earning power of a loan, or the borrower's ability to repay. Resources may therefore be misallocated.⁶ In the

⁶ For further discussion see Lindner⁽¹⁸⁹⁾, Doll⁽⁸²⁾ and Stigler, G.J. "Imperfections in the Capital Market", Journal of Political Economy, LXXV, No. 3 (June 1967) 287-292.

farm sector this is primarily a result of the difficulty of forecasting trends of agricultural prices and incomes. Baker and Holcomb⁽⁶¹⁾ consider that rural education of bankers will increase their knowledge of this risk factor and formal methods have been developed to isolate potential bad debts.⁷ However practical difficulties of estimating risk and uncertainty factors have meant that bankers have historically utilised methods of loanable funds allocation that are inconsistent with marginal principles (10.7) (b).

10.7 Trading Banks - Criteria

(a) Market Criteria

The Market structure will affect the efficiency of loanable funds allocation (10.4). To the extent that the following structural factors are observable, the allocation of loanable funds both to and within the farm sector will by definition be inefficient.

- (i) there are a fewer rather than a larger number of trading banks operating;

⁷ Boggess, W.P., "Screen Test Your Credit Risks", Harvard Business Review, VL, No. 6 (December 1967), 113-123.

- (ii) there are no close substitutes for bank finance, and there is restricted entry to the market;
- (iii) there is ignorance on the part of bankers and farmers;
- (iv) discrimination and artificial differentiation of the product (loanable funds) is possible;
- (v) there is external influence, for example, government controls (Fig. 10.3).

On (ii) - Substitutes

There are primarily two sources of short term funds to agriculture in New Zealand, trading banks and stock firms. In this situation there may be a high cross-elasticity of demand for funds, though this was not observable qualitatively in field investigation. Buck⁽⁷²⁾ considers that alternative credit sources are an inducement to inefficiency as institutions and farmers are unable to equate costs and revenues at the margin. On the other hand alternative sources of finance may exert a competitive influence by forcing average revenue arising from a farm loan closer to its average cost.

On (iii) - Ignorance

Knowledge imperfections have been mentioned as a factor inducing inefficiency (10.6). There may be impediments to efficient borrowing arising from the farm sector itself in the form of

ignorance and social and psychological barriers. Brimmer⁽⁷¹⁾ argues that bankers therefore enjoy a psychological advantage over farmers. As a result of the observed inertia to change (5.5), a bank may appear as a monopoly to an individual farmer who may be ignorant of the "going" rate of interest, and therefore susceptible to discrimination.

Farm community ignorance may work in reverse. Coombs⁽⁷⁶⁾ has observed that farmers tend to decrease their expenditure when the outlook is unfavourable to the point where they overlook borrowing for profitable investment. There are also farmers with investment projects who have an aversion to borrowing (e.g. see results of Chapter Eight). These factors will also induce inefficiency by placing limitations on output maximisation.

On (iv) - Discrimination

Discrimination is possible market behaviour where:

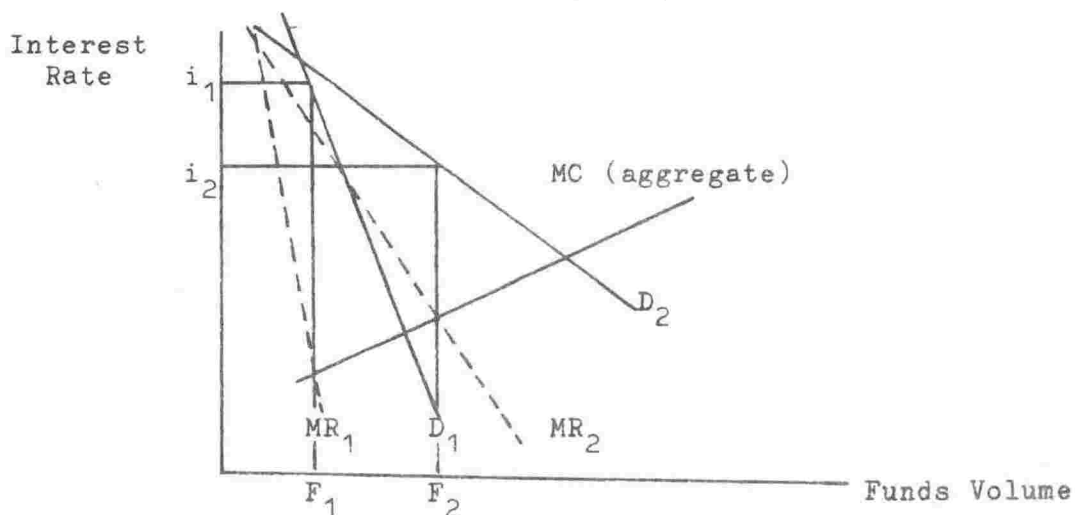
- (a) sellers possess market power;
- (b) market are divisible into small separable segments;
- (c) sub-market demands are differentiable;
- (d) the costs of separating markets are not high;
- (e) trade between sub-markets is limited.

To the individual farmer the market power of the banker is likely to be high, since the farmer has limited bargaining

strength. Other market sectors are likely to possess greater and more organised bargaining power and may be able to insist on more favourable treatment. In the theoretical market for bank funds, discrimination may be defined as the situation where variation in marginal interest rates is greater or less than variation in marginal cost.

From (c) above, market separation is a necessary discrimination pre-condition. On Fig. 10.1, an identifiable farm sector is shown to have an inelastic demand for bank credit (D_1) compared with a more elastic demand exhibited by the non-farm sector (D_2). Given the conditions (a) to (e) above, a bank could equate costs of and revenue from lending at the margin and charge two different prices with the higher price charged to the farm sector.

Fig. 10.1 Discrimination Effects of Separable Markets⁸
(Two Sector Economy)



⁸ See Bilas(9) p. 196, for further discussion of the implications of this diagram.

This inter-sector discrimination thesis can be extended to represent intra-sector discrimination. In the farm sector itself differences in socio-economic factors may facilitate separable market conditions. For example a borrower with an elastic demand for trading bank funds, a positive cross elasticity, large deposit balances and a widely known credit rating is, *ceteris paribus*, likely to receive more favourable treatment than a borrower of limited sums with an inelastic demand for funds, and no deposit balance. From this ~~discussion~~ the concepts of elasticity and separability are critical in determining the effectiveness of discrimination.

(b) Pricing Criteria

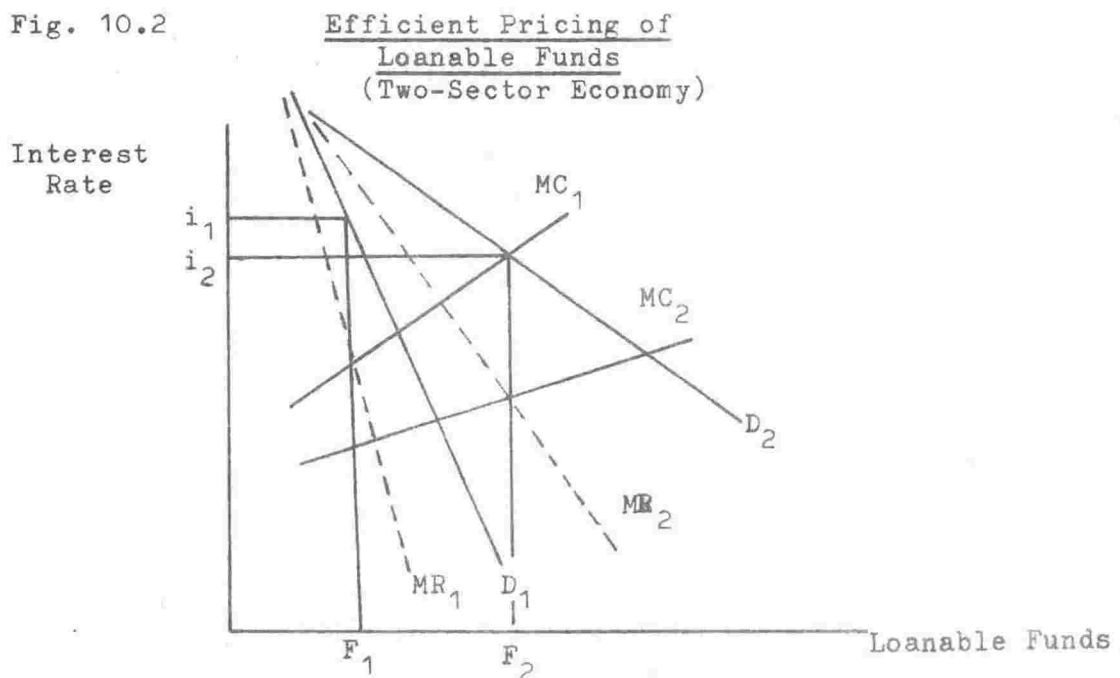
On the assumptions that markets are separable, and the marginal costs of lending to each sector can be uniquely identified, the pricing criteria for an efficient allocation of loanable funds in the dynamic context are that:

- (i) the marginal revenue from loans to each sector of the economy is equated with marginal cost of lending to that sector;
- (ii) the marginal revenue from each loan granted within the farm sector is equated with the marginal cost of granting that loan;

- (iii) optional services and other fees are charged for separately.

The prices charged to a sector are related to its elasticity of demand for funds (since this will affect marginal revenue to the trading banks) and the elasticity of cost increases, assuming risk to be an increasing cost (10.6) as an increasing volume of funds is lent to any one sector. In theory prices can be determined in all cases except where the elasticity of demand for funds, or of cost increases is unity. The concept of efficient pricing can be illustrated diagrammatically (Fig. 10.2). If therefore the demand for funds by the farm sector is inelastic, and cost increases are relatively inelastic, as a result of rapidly increasing risk, then higher farm sector interest rates are not discriminatory.

Fig. 10.2



Note: subscript 1 refers to the farm sector; subscript 2 refers to the non-farm sector.

To the extent that the following three factors are observable, the pricing policies will not be fully efficient:

- (i) profit maximisation is not the major goal of trading banks;
- (ii) the demand for funds is not related to the rate of interest;
- (iii) marginal pricing is not adopted in practice.

The profit maximisation goal is a basic condition of an efficient market (10.3 Assumption (vi)). This goal has been shown to be only one of several for farmers (2.2). To the extent that trading banks deviate from this goal the efficiency of funds allocation will be impaired. Since it would be difficult to determine the precise goal structure of trading banks from interview, the profit maximisation goal is maintained.

The marginal criteria is based on the role of the interest rate as the pricing factor. Empirical observation (2.5) has shown that the rate of interest was not a major determinant of ex-post or ex-ante borrowing, and this has been supported by the Credit Survey results (for instance see 4.4, 4.9

and Chapter Eight). Catt⁽¹⁷⁵⁾ has shown for other sectors of the New Zealand economy that the interest rate is a secondary factor. To the extent that the rate of interest is not a determining borrowing factor, deviation from marginal equilibria will occur.

Marginal pricing implies considerable flexibility of adjustment from institutions. For example, it necessitates a rapid upward adjustment of interest rates at the full employment level. Tucker⁽¹⁶⁰⁾ observes that the market for bank loans is imperfect as banks are slow to adjust their rates in the light of changing economic conditions. He argues that the effect of lags forces banks to ration loanable funds through imposition of direct limits rather than through the price mechanism. Borrowers with different credit ratings are allowed to borrow funds at a constant interest rate to a certain limit, beyond which the supply of funds is inelastic. This rationing may be accompanied by measures such as a refusal to loan for new enterprises, the provision of capital loans only on a short term basis if at all, and a list of "use preferences" for borrowed funds. For example, borrowing for seasonal expenses may be treated more favourably than borrowing for capital purposes. Baker and Irwin⁽⁶²⁾ contend that the effect of limits (usually based on available security) will lead to an inefficient allocation of funds. This is as a result of the deviation from the "future earning power" marginal principle and the adverse effect of a limit on the attainment of an

economically optimum organisation. The tendency will be for loanable funds to be diverted to borrowers already in stronger ex-post financial positions. Credit Survey results have highlighted the relatively weaker financial position of farmers with borrowing problems (Table 5.13).

The practical problems of implementing a marginal pricing system are therefore likely to encourage trading banks to utilise average or full cost pricing techniques in association with non-price rationing. Baumol⁹ suggests that these "rule of thumb" pricing systems are an easy alternative to marginal pricing and in many cases the resultant efficiency of resource allocation is "... not too bad...". There is a theoretical basis for the use of non-marginal pricing techniques, particularly if banks believe that the demand for loanable funds is inelastic with respect to price, that their costs are relatively stable, and that they should be receiving a "fair" and "just" return on their assets. Even so, non-marginal pricing techniques will lead to inefficiency in resource allocation where the marginal cost of a loan is at variance with the average cost. This may be where there are large seasonal

⁹ Baumol, W.J. Business Behaviour Value and Growth. New York: Harcourt, Brace and World Inc., 1967, p. 30.

fluctuations in aggregate demand for funds, or where free optional credit services, such as budgeting, are provided with a loan.

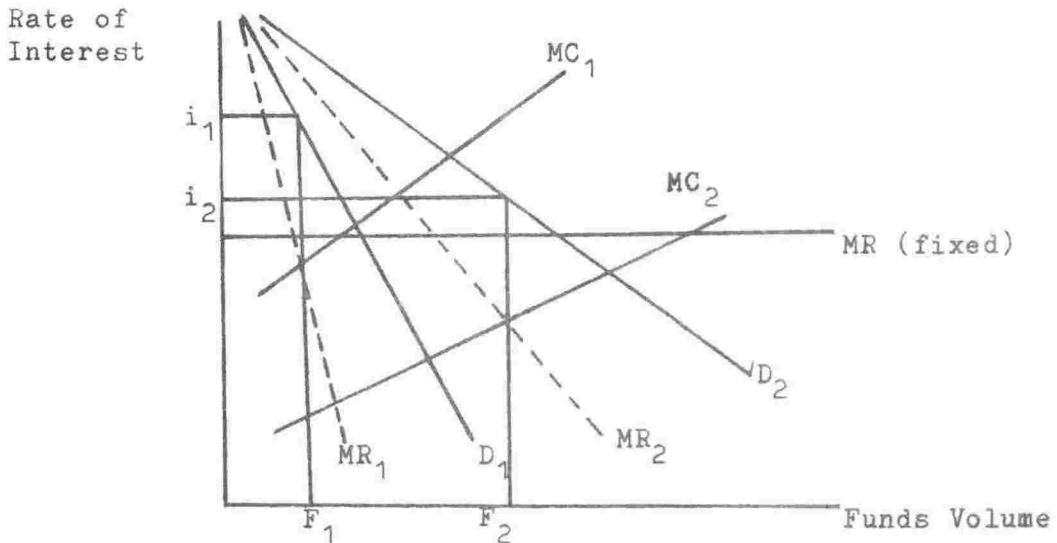
(c) Funds Allocation Under Institutional Constraints

Theoretical allocation analysis is based on the premise that the price mechanism is fully operative (10.3 Ass. (i); 10.5 Ass. (iii)). In New Zealand funds directives are imposed by the Monetary Authorities (11.8) and restrictions placed on the average interest rate charged by trading banks. This has traditionally been set at a level lower than the equilibrium rate at which the market would be cleared. The effects have been that:

- (i) there is an excess demand for funds at the going market rate;
- (ii) the trading banks aggregate marginal revenue curve from lending will tend towards infinite elasticity, at the fixed rate of interest. This is at variance with "real" marginal revenue schedules of different sectors and efficient allocation of resources cannot be achieved under the imposed marginal conditions (Fig. 10.3).

Fig. 10.3

The Effects of Institutional
Constraint on Resource Allocation
 (Two-Sector Economy)



in sector 1, where $MR_F = D_1$, $MR_1 < MC_1$)
) inefficient resource
) allocation
)
 in sector 2, where $MR_F = D_2$, $MR_2 > MC_2$)

Under this constraint other non-marginal allocation methods are a necessity. Such an allocation model has been developed as a result of empirical observation (11.18). It involves an extension of the marginal revenue concept to cover all aspects of the institutional-borrower relationship and is based on the opportunity cost approach to resource allocation (10.2).

10.8 Stock and Station Agents

The role of stock firms as a quasi banker has been discussed (Chapter Six). Much of the preceding discussion (10.6 - 10.7) is therefore relevant and is not repeated. An additional variable is that the stock firm's dual role enables them to obtain a trading return in addition to an interest return from lending funds.

Market criteria to be examined are similar to those of the trading banks (10.7(a)). To the extent that the following factors apply, resource allocation will be inefficient:

- (i) there are a fewer rather than a larger number of firms;
- (ii) there is no close substitute for stock firm finance;
- (iii) there is ignorance on the part of stock agents and farmers as to market operations;
- (iv) there is the possibility of discrimination and artificial differentiation of loanable funds.

There are a number of markets for stock firm funds. These will include farm loans, non-farm loans and investment and re-investment in the stock agent business. It is likely that these markets can be visibly differentiated. It is also likely that there will be variations in knowledge according to funds use. To the extent that funds are diverted to a controlled use, stock firm uncertainty is likely to be less than when funds are lent to the farm sector in small amounts.

Pricing criteria are also similar to trading bank criteria (10.7(b)):

- (i) marginal revenue from funds diverted for each purpose is equated with marginal cost;
- (ii) in particular, marginal revenue from each loan granted within the farm sector is equated with its marginal cost;
- (iii) optional service and other fees are charged so that costs and revenues are equated at the margin.

An extension of Lindner's⁽¹⁸⁹⁾ approach suggests that an effective yield formula on a loan of \$a might be:

$$j = E(i_1) / \left\{ (1 + c \cdot \frac{E(y) + E(x)}{a}) \right\} + E(i_2)$$

where $E(i_1)$, c , $E(y)/a$, $E(x)/a$ are defined previously (10.6).

$E(i_2)$ =expected yield from purchase of goods and services as a direct result of the loan.

This effective yield concept is one basis for the determination of an efficient funds allocation.

10.9 State Advances Corporation

The Corporation is the Government's leading rural and urban lending agency. The approach to the investigation of this institution could therefore be made in three ways:

- (i) an efficiency approach;
- (ii) a welfare approach;
- (iii) a combined welfare/efficiency approach.

An approach based on (i) would involve the rigid adoption of stated efficiency criteria (10.3) and a welfare approach would require the development of an alternative conceptual framework. A priori observation suggests that the market role of the Corporation is a socio-economic one, and its allocative mechanism is examined in this context. As a result the strict efficiency criteria are relaxed.

Basic analytical assumptions are still relevant (10.5) and in particular:

- (i) resources of the Corporation are not necessarily assumed to be limited;
- (ii) the rate of interest is assumed in theory to be the basis of funds allocation.

For an efficient macro-allocation of resources the Corporation should be free to attract inputs according to marginal principles. This would imply that profit maximisation is its major goal (10.3 Ass. (vi)). This goal is unlikely to be permitted by Government and Corporation funds and staff are limited by Government. These restrictions may induce inefficiency of resource allocation in the economy, since any fluidity of resource transfer is automatically impeded (10.3 Ass. (viii)).

Government interest rate restrictions are also imposed on the Corporation. Particularly when combined with a state of excess demand, this measure will force the development of non-price rationing criteria. The welfare role of the Corporation may permit concessionary rates to be charged even though this may result in deviations from optimal efficiency. The goal dichotomy of the Corporation necessitates the development of an alternative set of allocative criteria. To maximise the efficient allocation of funds to the farm sector the marginal criteria is maintained. In cases where welfare considerations are accepted by society, concessionary pricing is allowable as an allocative tool.

A formal statement of market structure and criteria is not appropriate as the close relationship of the Corporation with Government is assumed to ensure that it is essentially a benevolent monopoly.

Pricing criteria are more relevant and may be stated:

- (i) the marginal costs of granting Corporation loans are under normal circumstances equated with marginal revenue;
- (ii) (i) above holds for both inter- and intra-sector resource allocation;
- (iii) service and optional service fees are separately charged for.

The funds allocation process may be visualised in three stages:

- (i) the allocation of funds to the farm sector in competition with other sectors;
- (ii) the allocation of funds within the farm sector to broad uses, such as development or amalgamation;
- (iii) the allocation to borrowers within the defined use categories.

The effective yield formula may be utilised with allowance for a welfare factor, where:

$$j = E(i)/\eta + c \cdot \frac{E(y) + E(x)}{a} + E(s)$$

where j , $E(i)$, c , $E(y)/a$, $E(x)/a$ as defined and $c = 1$, assuming Government neutrality between yield and debt aversion.

$E(s)$ represents welfare yield of a loan. The practical difficulties of measuring this component would be acute but the theoretical effect is to adjust effective yield, j . Where the welfare component is zero, the bases of allocation are the marginal criteria alone.

Aspects of the Corporation's rural lending to farmers in the light of this loose efficiency framework are discussed in Chapter Thirteen.

CHAPTERS 11 AND 12 - INTRODUCTION

The market investigations have been conducted by way of the interview method of research. Lengthy unstructured interviews were conducted with economists, management staff, research and development staff and practical bankers and stock agents, primarily at Head Office level. All the national trading banks and stock firms were approached, and in addition representatives of two regional stock firms. Whilst the interview approach has the advantages of comprehensiveness and is able to assess motivational content, it has the disadvantage of lacking quantitative objectivity and is not a rigorous analytical approach. Refused requests confirmed that much of the real data necessary to conduct an objective quantitative investigation was unavailable, since access would impinge on legitimate business interests. In these circumstances, and since the overall study is envisaged as introductory in concept,

CHAPTER ELEVENSOURCES OF FARM FINANCE -TRADING BANKSA Market Structure11.1 Market Actors

Five trading banks currently operate in New Zealand. Their New Zealand activities have evolved from the mid-nineteenth century¹ and all have some tradition of operations within the farm sector. The inter-bank distribution of this business (Table 11.1) highlights the prominent market role of the Bank of New Zealand and the limited role of the Commercial Bank of Australia.

Table 11.1

Distribution of Aggregate Advances
and Demand Deposits Between the Five Trading Banks
 (% of 1970 Monthly Average)

	<u>All</u> <u>Advances</u> ¹	<u>Farm Sector</u> <u>Advances</u> ²	<u>All</u> <u>Deposits</u> ¹	<u>Farm</u> <u>Sector</u> <u>Deposits</u> ²
Australia and N.Z. Bank	22	23	23	25
Bank of New South Wales	13	9	14	16
Bank of N.Z.	40	50	39	42
Commercial Bank of Australia	7	4	8	4
National Bank of New Zealand	<u>18</u>	<u>14</u>	<u>16</u>	<u>13</u>
	<u>100</u>	<u>100</u>	<u>100</u>	<u>100</u>

¹ Butlin, S.J. The Australia and New Zealand Bank, London: Longman, Green and Co. Ltd., 1961, p. 188.

- ¹ Average Monthly Returns, published in the New Zealand Gazette, under s(31), ss(4) of the Reserve Bank of New Zealand Act, 1964.
- ² Trading banks, pers. comm.

Information is not available on the inter-bank distribution of farmer accounts by number. The problems of definition of a "farmer" are acute and trading bank decisions are based on the volume of sector business, rather than on the number of account holders. The estimated inter-bank distribution of accounts by number (Table 3.2) corresponds with the distribution by volume above (Table 11.1).

No information is available on the inter-bank spatial distribution of farm sector business. Any such distribution would primarily be a function of historical accident.² The distribution of trading bank branches according to rural and urban location reflects their farm sector involvement as per Table 11.1.

On the other hand, branch location also indicates the social value placed on rural sector business rather than its economic value. There is a loose economic relationship between

² For instance, see Butlin, op. cit., and Sinclair, K., and Mandle, W.L. Open Account - A History of the Bank of New South Wales. Wellington: Whitcombe and Tombs Ltd., 1961 for details of the early history, farm business and spatial location of two trading banks.

branch location and branch worth. There are practical difficulties of measuring and defining branch worth, and as a result there is an inertia amongst banks to close down branches which have become unprofitable in rural areas. Branch location is therefore unlikely to be a significant economic parameter.

B Market Characteristics

11.2 Product Differentiation

To the extent that trading banks are able to artificially differentiate and uniquely identify their services the efficiency of the market will be impaired (10.4(ii)). The banking sector competes for business in two ways:

- (i) with other financial institutions (inter-sector competition);
- (ii) between themselves (intra-sector competition), through
 - (a) price variation,
 - (b) service variation.

On (i): As a direct result of the restrictive nature of monetary policy in New Zealand, trading banks

have not grown as rapidly as other financial institutions.³ Demand deposits have been growing slowly and the community's funds have been diverted to more attractive uses. Bankers believe that farm sector deposits have been diverted in this way, though no quantitative evidence is available to support this hypothesis. To the extent that this resource shift does occur relative to other sectors, the farm sector may become more or less attractive to trading banks.

On (ii): The aim of aggressive advertising is to attract new deposits, as the situation of excess demand for loanable funds (10.7(c)) has alleviated trading banks from the necessity of selling this commodity. Despite low marginal returns the youth market is the major focus of advertising campaigns. This is particularly through television, even though this medium has the properties of being both non-selective and non-adjustable. The effect of this advertising has been to preserve the trading banks' status quo and its effect on deposit attraction has been small. As farm sector deposits are declining (Appendix E) and the sector is too small a uniquely defined area for the profitable use of mass techniques, the

³ See Anon. "New Zealand Monetary Policy and Trading Bank Growth", A.N.Z. Bank Quarterly Survey, XX, No. 3 (April 1971), 4-6 and Bayliss, L.C. "Monetary Policy in New Zealand", Paper presented to the Manawatu Economic Society, Palmerston North: March 1971.

effect of aggressive advertising on the operations of the farm credit market is likely to be small.

On (ii-a): To preserve existing and new balances trading banks engage in defensive advertising. Induced by Government interest rate controls (11.13), price cartels operate and price competition is restricted to marginal rate variations for deposits greater than \$25,000, or two years in duration. These deposits originate almost entirely from the personal sector and this limited price competition is unlikely to have any impact on the operations of the farm credit market.

On (ii-b): Service advertising is an adjunct to aggressive deposit advertising. Its aim is to promote services that are ancillary and complementary to deposit balance maintenance. All banks offer fundamentally similar services and this advertising is defensive in concept. Uses made by farmers of bank services have been discussed (5.7) and it is unlikely that these artificial differentiation attempts have any effect on farm credit market activity.

An ~~ex~~ception may be the convenience factor and this is related to branch network structure. It is an increasingly less important element under contemporary conditions as:

- (i) changing modes of transport has permitted increasing farm sector spatial flexibility (5.2);
- (ii) there is an increasing desire of bank customers to deal

with large branches for "big man" service, rather than small branches for "small man" service.⁴

Despite observed inertia, these factors have encouraged trading banks to contemplate accelerated branch rationalisation. Increasing rural representation is therefore unlikely, and decreasing representation can be envisaged as the norm.

The most effective rural advertising is a frequent and intimate contact with customers, and this has been observed to be lacking (5.8). Head Office policy is to encourage bank managers to visit rural clients and whilst this is time consuming and often directly unproductive, it does generate direct and supplementary goodwill, as a result of the diffusion effect through the rural community. In recent years dynamic changes in the banking structure, such as the development of computer accounting, have rendered bank managers to become increasingly immobile in their offices. This immobility is likely to have a qualitative effect on farm credit market operations.

An alternative means of fostering rural goodwill adopted by two trading banks has been to promote farm courses, scholarships and farmer exchange schemes. Whilst this advertising has a negligible effect on direct business generation, it does

⁴ One Trading Bank. Customer Service Investigation, (confidential report), 1970.

constitute an important element of the accepted "social responsibility" goal of trading banks.

Trading bank advertising policies are therefore designed to attract and retain deposit funds by inducing product differentiation. It is unlikely that these policies have any distorting effect on farm credit market operations.

11.3 Consumer Loyalty

In a perfectly competitive market the assumption of neutral loyalty is made (10.3). In the farm credit market strong consumer loyalty has been observed (5.3, 5.5, 5.6). Inertia to transfer business has the effect that the majority of farmers are voluntarily tied to their banks. Under the existing institutional infra-structure there would be limited personal or sectoral gain in any fluidity of business transfer. Indeed, consumer loyalty is a necessary pre-requisite to borrowing, and bankers view customers who do transfer accounts with inherent suspicion.

11.4 Freedom of Market Entry and Exit

Operators in an efficient market have freedom of entry and exit (10.3). As a result of capital entry requirements, the small number of trading banks in New Zealand is taken as given. This small number facilitates

comparatively easy and effective operation of a cartel pricing system (e.g. 11.2, 11.17) which will impair market efficiency, since it encourages use of average rather than marginal pricing. There is free market entry to potential depositors but prospective borrowers are subject to preconditions. Consumer loyalty is necessary (11.3) and *ceteris paribus*, loan applicants with a long credit history are likely to be more favourably treated than new market entrants. Ignoring the influence of security availability this implies that older borrowers are more likely to have ready access to loanable funds than younger borrowers, as past business has traditionally been weighted heavier than new business. There will therefore be a tendency towards resource misallocation. Following Lindner's formula (10.6), this can be shown algebraically. The simplifying assumptions are made that:

- (i) from 10.6, $E(x)/a$ is zero;
- (ii) $MC = AC = \text{constant}$ (i.e. cost of attracting deposits is constant);
- (iii) Nominal $MR = AR = \text{constant}$. (i.e. interest rate fixed, as per 10.7(c);
- (iv) risk is accounted for as a reduction from nominal MR , rather than as an addition to MC ;

(v) two loans granted to borrowers, j, k.

Effective marginal revenue from loan a, j_a , is therefore given by

$$j_a = E(i)_j / (1 + c_j \cdot E(y)_j / a_j)$$

(definitions as per 10.6).

Equilibrium is given where

$$E(i)_j / (1 + c_j \cdot E(y)_j / a_j) = E(i)_k / (1 + c_k \cdot E(y)_k / a_k) \quad - (1)$$

Assume true equilibrium is where

$$E(i)_j = E(i)_k \text{ from assumption (ii)} \quad - (2)$$

$$\text{and } E(y)_j / a_j = E(y)_k / a_k \quad - (3)$$

i.e. equal true risk for all equal dollar loans, then,

$$c_j / c_k = 1 \text{ is an equilibrium condition.}$$

Now, if risk/yield preference is such that

$$c_j = 2c_k$$

i.e. as a result of past business, loyalty etc., customer j is

ranked preferably to customer k.

Then perceived equilibrium is given where

$$\frac{E(y)_k}{E(y)_j} = 2, \text{ from (1) above.}$$

But from (2) and (3), this is not a true equilibrium condition and resources will be misallocated.

11.5 Market Information - Trading Banks

The theoretical role of market information has been fully discussed by Stewart^(46 Ch. Three), who argues that a correct appreciation of the benefits of information will lead to a more efficient resource allocation. **Four** classes of market information are considered.

- (i) informal rural education and experience gained by "on the job" training;
- (ii) formal rural education in the course of training;
- (iii) background market information collected for policy decision purposes;
- (iv) information collected in the course of an individual loan application.

On (i) - "On the Job" Training: Practical implementation of such training ensures that the majority of bank staff will receive rural branch experience. In addition, the nature of the New Zealand economy has in the past been sufficient to ensure that a high proportion of bank staff were recruited from rural areas.

A resulting phenomenon of "on the job" training has been the development of a set of "rural" and "urban" managers. This is partially a result of variations in necessary expertise according to the nature of predominant branch business, and partially a result of differences in education and ability. Rural branch management has provided an effective selective or self-imposed promotion limit. Standards of specialised banking expertise are therefore likely to be lower than in urban areas. On the other hand professional demands on individual bank staff in rural areas are more varied, but less complex in nature.

On (ii) - Formal Training: Formal training procedures have in the past not been extensively utilised in New Zealand as almost exclusive reliance was placed on "on the job" training and the accumulation of lengthy experience.⁵ Rural staff courses and seminars have played a minor educational role, in contrast to the United Kingdom where there has been a strong felt need for formal rural seminars and training. In recent

⁵ Bank of New Zealand, Annual Report, 1956.

years agricultural seminars have been held for New Zealand bankers⁶ though their information dissemination effect has not been analysed.

On (iii) - Policy Information: Ideally, internal and external information should be processed to supply policy making background material. In practice, far greater import is placed on information generated within the banking system than on information injected into the system. Internal information is likely to be restrictive in the context of dynamic resource allocation since its major purpose is to furnish the internal mechanism of the contemporary system. However the impact of Government lending controls (11.8) has been sufficient to negate any real benefit of external information (e.g. profitability of emergent industries) in determining dynamic resource allocation.

As a result of these factors the banking sector feels that it is sufficiently well informed on trends and developments within the farm sector and that there is little additional information that would be of any policy formulation value.

On (iv) - Loan Application: Information generated as a result of a loan application may be classified under:

⁶ For example "Agricultural Seminar for District Bankers", Lincoln College, November 1970.

- (a) the personal factor and past credit history;
- (b) financial planning skill and foresight;
- (c) dollar loan required and assessed sufficiency;
- (d) purpose of the loan;
- (e) the ability to service borrowing;
- (f) details of applicants assets and liabilities;
- (g) collateral and other business.

Bankers consider that adequate information is generated from the farm sector under these headings to competently assess the merits of loan applications.

In dynamic resource theory, security (item (g) above) does not play a prime allocative role. As a result of an excess demand for loanable funds in New Zealand at the given price (10.6(c)), security plays an allocative role in the first instance. Trading banks are able to reject all applications without first class security, and funds are subsequently allocated according to other criteria (11.18). The implications of this requirement are that:

- (a) trading banks are able to utilise conservative rule of thumb security valuation criteria (Table 11.2), with no formal allowance for managerial or location variance.

Table 11.2

Example of Standard Security Valuation
"Norms" Operated by a Trading Bank (April 1971)

Land

66c. in the \$1 of the unencumbered value established for mortgage purposes.

Stock

Winter numbers at conservative standard values, less 25% (sheep) and 15% (cattle).

Plant, Machinery and Vehicles

Under 12 months old - 50c. in the \$1 (unencumbered balance sheet value).

Over 12 months old - 33c. in the \$1 (unencumbered balance sheet value).

Other (readily saleable) Assets

33c. in the \$1.

- (b) the security requirements and valuation above, means that funds are likely to be diverted to larger units, operated by older operators;
- (c) with the excess demand for funds, the bargaining ability of individual farmers is limited, and banks are able to effectively demand excess security;
- (d) as a result of (c) above, future borrowing power might be excessively restricted. This result was not supported by Survey data (Chapter Five).

11.6 Market Information - Farmer Borrowers

In comparison with other sectors the farm sector has traditionally been less accustomed to supplying detailed information to support loan applications. This has been a result of a number of factors:

- (i) a lack of financial training, particularly amongst older farmers (3.4);
- (ii) the generally preferential lending treatment accorded to the farm sector in the past. Bankers believe that farmers have come to accept as a right the ready availability of bank credit;
- (iii) the comparative ease and simplicity of comprehension of farm accounts;
- (iv) the spatial immobility of the farm sector;
- (v) the traditional role of retained earnings as the predominant means of finance.

The result of these factors has been that for a proportion of farm loan applications information is inadequate, and for a larger proportion (an estimate of 50% of all applications has been made) information is incomplete. In this respect bankers are aware of the need

to promote a higher standard of farm sector budgeting and cash planning. The low proportion who have incorporated these techniques into their management practices has been discussed (3.4).

"Shopping around" by farmers for loanable funds is not a feature of market behaviour. With marginal inter-bank interest rate variation and the market entry requirements (11.4), there would be no advantage in such a search. The farm sector is therefore likely to be unaware of funds availability from other banks. On the other hand, similar factors will preclude other sectors from engaging in this search process. "Shopping around" is an observable market feature only in cases where large deposit funds are being lodged. (11.2).

The conclusion is that whilst the farm sector is unaware of alternative trading bank credit sources, this lack of information is unlikely to induce "information discrimination" since other sectors are in a similar situation. At the micro-level, information inadequacy is likely to preclude the acceptance of otherwise sound propositions. There may therefore be a misallocation of resources, though quantitative evidence is not available.

11.7 Sub-Market Identification - Introduction

Sub-market identification is a necessary prerequisite to market discrimination (10.7(iv) and associated resource misallocation. Two ways are considered in which the market for trading bank loanable funds may be uniquely identified:

- (i) inter-market distinction as a result of the operations of the tier system of monetary control (11.8);
- (ii) intra-market distinction as a result of:
 - (a) differences in the elasticity of demand for funds;
 - (b) the availability of alternative credit sources (11.9, 11.10).

The effect of the tier system on market conduct is considerable and detailed discussion is necessary.

11.8 Sub-Market Identification - The Tier System

The tier system of trading bank advances control has developed from the thesis that a one tier system of monetary control does not permit a system of priorities and does not automatically allow for the allocation of resources into sectors deemed desirable by the Authorities. In

March 1965 when the system was originally introduced,⁷ priority (upper tier) sectors were defined as the farm sector, freezing works, meat companies, woolbuyers and stock and station agents. An additional "special export" sector was introduced in 1967.⁸ All other sectors were deemed to be "lower tier".

Fixed targets are currently set for aggregate lower tier lending limits by Treasury and The Reserve Bank to reflect Government Credit policy. This has allowed for limited growth in advances. For instance in the financial year 1969-70, trading banks were permitted a 4.5% increase in aggregate lower tier advances, and in the financial year 1970-71, a 5.5% increase. Lending targets are set by Government six months in advance, with monthly breakdowns, and trading banks are required to report ex-post lower tier advances to the Reserve Bank. Excess lending over target is penalised. These penalties currently operate on a sliding scale of between seven and 10%, and the extent of target deviation determines both the volume of penal borrowing and the average rate at which it is charged.⁹ Supplemented by overdraft interest rate controls,

⁷ Anon. "Targets for Bank Advances", Reserve Bank of New Zealand Bulletin, XXVIII, No. 7 (July 1965), 72-74.

⁸ Memorandum from the Reserve Bank of New Zealand, to N.Z. Bankers Association, 21 July 1967.

⁹ Statement by the Hon. R.D. Muldoon, Minister of Finance, (B.6A), 27 October 1970, p. 15.

with an average rate of 6% (11.17), these penalties have proved to be effective.

Up to December 1970 upper tier advances were entirely free from control. At that time limits were imposed on upper tier advances¹⁰ and the exceeding of limits may involve trading banks in penalty borrowing. However, the farm and stock and station agent sectors have been exempted from this control.

A hypothetical example of tier system calculations is shown in Table 11.3 below.

Table 11.3

Simplified Example of the Arithmetic
Control of the Tier System and the Calculation
of Penalty Borrowing
(Bank A. Month B)

Borrowing

Month B - Aggregate Lower Tier Ceiling \$100 m.

	<u>Bank A</u> (%)	<u>Bank A</u> (\$)m	<u>All Banks</u> (\$)m
Line 1 <u>Lower Tier Advances</u>			
Four year average (1966-9)	20	20	100
Line 2 <u>Deposits</u>			
Four year moving average	20		
Current Month	<u>19</u>		
Change	-1		
Line 3 Adjusted Share of Lower Tier ceiling	19	19	100
Line 4 Actual lower tier advances (Month B)		23	110
Line 5 Amount over (+) or under (-) ceiling		+4	+10
Line 6 Less deposit adjustment*		2	6
Line 7 Penal Borrowing - Month B		2	4

¹⁰ Report in New Zealand Herald, 22 December 1970.

*Note: "adjustment for banks under ceiling" calculation has not been discussed.

The distribution of the aggregate advances target to each trading bank is based initially on a four year average distribution of lower tier advances between them. The base is currently (June 1971) the calendar years 1966 to 1969 (Line 1). This distribution:

- (i) assumes that the historical distribution was in some sense "normal";
- (ii) makes no allowance for "real" growth of individual bank advances. Actual growth is restricted to levels based on historical performance;
- (iii) therefore discriminates against trading banks whose lower tier advances would increase at a rate faster than the permitted rate;
- (iv) discriminates against banks with a historically larger proportion of lower tier business, and favours trading banks with a larger proportion of upper tier lending;
- (v) discriminates in favour of any bank increasing upper tier advances at a faster rate than the average of all banks.

The basis of target allocation therefore superimposes non-market forces on to the trading banks actual rate of growth and this will affect the efficiency of resource allocation.

The historical share of total advances is subsequently adjusted by an allowance for changes in deposits (Line 2). This is based on the assumption that a change in deposits will be reflected by an immediate adjustment in advances outstanding. This **procedure** will discriminate against banks with significant annual deposit fluctuations and takes no account of time lags. On the other hand this rolling average does allow for dynamic changes in deposit distribution.

With the "adjusted share of bottom tier ceiling" computation (Table 11.3, Line 3) is compared an individual trading banks' actual market performance for any month. The over or under-ceiling calculation is subsequently made (Line 5). Final adjustments are made to account for the influence of banks operating under the ceiling, and the effect of long term deposits. (Line 6). Penal borrowing is therefore determined (Line 7).

The deposit adjustment (Line 6) was designed as a means of encouraging trading banks to compete for term deposits.¹¹

¹¹ Statement, op. cit., p. 16.

The scheme permitted them to increase lower tier ceilings at the rate of eighty cents in the dollar for time deposits in excess of two years. From October 1970 trading banks proved singularly successful in attracting such deposits and were therefore able to increase lower tier advances and frustrate monetary policy by reintroducing a direct advance-deposit relationship. From March 1971 regulations were adjusted to allow for an eighty cents in the dollar ceiling increase for time deposits in excess of three years.

The effect of these adjustments on the determination of penalty borrowing is that deposit balance changes are critical (Lines 3 and 6). The tier system therefore accentuates the need for banks to attract deposits rather than lending business, and has diverted their attention to sectors with substantial deposit funds.

The effects of the tier control mechanism on banking sector operations has been substantial. In particular:

- (i) the system has effectively segregated the market for bank credit and introduced discrimination. This has been imposed by the Authorities rather than the trading banks themselves;
- (ii) bank managers are conscious of penalties and therefore forced to discriminate, from (i) above;

- (iii) the chance of success of an acceptable banking proposition not in accordance with official policy is reduced. A non-priority proposition may be accepted at one instant and rejected at another, merely as a result of changes in priority classification;
- (iv) potential lower tier customers are increasingly approaching other sources of more expensive finance in the first instance;
- (v) there has been a shift of resources into upper tier "priority" sectors (Appendix E);
- (vi) some rural branches are increasing loan business at a faster rate than urban branches, despite real growth factors;
- (vii) the system of control tends to preserve the "status quo" relationship. Banks are loyal to existing customers and new borrowers find it increasingly difficult to enter the market.

The tier system permits a short time factor for aggregate loan adjustment in accordance with targets and centralised lending control is inevitable. The system also strengthens the role of the managerial discretion control

mechanism. Under this funds allocation system, managers are generally free to grant loans up to a stated limit. This limit will vary from branch to branch according to location and predominant nature of business. One bank currently utilises the discretionary range of between \$2,500 for small branches and up to \$10,000 for large branches. Applications for sums greater than these limits are referred to Head Office for approval. Aggregate advance levels can therefore be controlled centrally with the degree of control being a function of the limits allowed.

The discretion control mechanism has effects on resource distribution. The speed of a loan decision will be a function of the particular branch a customer deals with. Discretionary limits granted will in the individual case bear no relationship to the proposal. It is therefore theoretically possible that equivalent propositions may receive different funds allocations. Quantitative data is unavailable to support this hypothesis.

11.9 Sub-Market Identification - Interest Rate Elasticity

There is no evidence available of any inter- or intra-sector variation in the interest elasticity of demand for funds. The impact of interest rate adjustment on the demand for funds is low in New Zealand.¹² This is

¹² Anon. "Financing of Small Business in New Zealand", A.N.Z. Bank Quarterly Survey, XVII, No. 1 (October 1967), 1-8. See also Catt (1975), p. 22.

because trading bank interest rates have in recent years been lower than other market rates and tax deductible interest payments are of minor importance to borrowers in relation to funds availability. Mandatory interest rate controls (11.17) are sufficient to preclude a conclusive empirical study of the effect of rate changes. It would therefore not be possible to uniquely identify the effect of interest elasticity for funds within the farm sector. A priori, this is likely to be negligible.

11.10 Sub-Market Identification - Sources of Borrowing

The availability of stock firm finance might permit identification of two sub-markets:

- (i) farmers who borrow entirely from the banking system, and;
- (ii) farmers who borrow partially from banks and partially from stock firms.

Ceteris paribus, the risk and consequent economic cost of split loan business might be envisaged as being higher than on an equivalent loan granted to a borrower who restricts his borrowing entirely from the banking system. No attempts have been made to identify and approximate these economic costs. However uncertainty will be a feature of "split" business, as there is no formal facility for

information exchange between the stock firm and banking sectors. Informal contact occurs, but the real effect of this contact is difficult to observe.

A priori the banking sector assesses applications from "split" borrowers less favourably. Special consideration is noted of the extent of funds split and the distribution of deposit balances. On the other hand despite these possible limitations, split level business offers a borrower an additional flexibility element in business control.

In conclusion, bankers agree that individual cases are treated "on merit" and that sub-markets based on business split cannot be uniquely identified except at the limit.

11.11 Trade amongst borrowers

In an efficient market, trade is not prevented amongst buyers (10.2). Conversely, a necessary condition for effective market discrimination is that such trade is prevented (10.7(a)). Stock firms and farmers are both upper tier borrowers (11.8), and trade between these two sectors takes place. In this respect trading banks may be considered as wholesalers and stock firms as retailers in the finance distribution chain. As a result of lending to farmers through stock firms, banks suffer the implicit cost of a loss of identity to farmers of finance source.

This on-lending may increase the efficiency of resource allocation as:

- (i) a high proportion of trading bank costs are fixed. The cost effect of an increase in the number of loans granted, by transferring loanable funds from the firm to the farm sector, or a decrease in the number of loans, will be inelastic;
- (ii) stock firms have a detailed specialised knowledge of farm sector behaviour and are technically competent to dispense credit in the course of their operations;
- (iii) the effect of the Moneylenders Act (1908), ensures that stock firm interest rate mark-up is limited;
- (iv) the peak demand for trading bank funds by stock firms (Table 11.4) does not coincide with the periods of peak demand for bank funds in aggregate. This seasonal profile suggests that the opportunity cost of lending to stock firms by trading banks is not high.

Table 11.4

Seasonal Indices: All Bank Advances
and Bank Advances to Stock Firms
 (Period 1963-70; base index 100)

	<u>All</u>	<u>To Stock Firms</u>
January	91.7	98.6
March	107.0	95.9
May	104.3	71.6
July	99.7	63.3
September	100.2	103.1
November	97.1	167.4

Source: Reserve Bank of New Zealand Bulletin (various)

(c) Market Conduct - Pricing Aspects

11.12 Loan Costs

The economic costs of making a loan have been discussed (10.6). They are:

- (i) the direct cost of loanable funds (11.13);
- (ii) the direct incidental loan cost (11.14);
- (iii) the "risk" cost (11.15).

To determine whether banks are allocating funds in accordance with marginal principles it is necessary to identify these costs, and show that they are variable in individual loan cases. This is the marginal approach to resource allocation (10.2).

11.13 Direct Cost of Loanable Funds(a) Time Deposits

A recent monetary phenomenon in New Zealand has been the rapid growth of interest bearing deposits as a proportion of all bank deposits (Table 11.5).

This is primarily a result of Government liberalisation measures over the control of interest rates and term lending.¹³

Table 11.5

Aggregate Banking Sector Time and Demand Deposits 1963-70

(Last Week in June, Seasonally Corrected Data)

<u>Year</u>	<u>Demand Deposits</u>	<u>Time Deposits</u>	<u>Time as % All Deposits</u>
1963	575.1	109.6	16.0
1964	620.3	119.1	16.1
1965	637.2	109.2	14.6
1966	611.7	126.9	17.2
1967	584.2	134.6	18.7
1968	584.1	151.8	20.6
1969	608.2	183.9	23.2
1970	619.7	294.8	32.2

Source: New Zealand Gazette (various)

This increase has originated largely from the private sector. The farm sector has played a minor role in this increase, and the proportion of aggregate time deposits currently accruing to the farm sector is

¹³ "Report on 1969 Budget", Reserve Bank of New Zealand Annual Report, 1969-70, p. 12, and Statement by Minister, op. cit., p. 16.

estimated to be 9%.¹⁴ This compares with the 12-13% of demand deposits that accrue to this sector.

The maximum rate of interest permitted by Government on time deposits of less than two years and/or under \$25,000 was 4.8% in June 1971. A trading bank interest rate cartel is in operation for deposits of specified duration up to two years. This agreement is likely to restrict the ability of aggressive banks to attract funds at the margin. Trading banks are free to compete for large long term deposits (11.2) and some banks are paying up to 6½% on substantial five year deposits. On-lending these deposits at 7½% is estimated as necessary to break even, and at 8½% to make a profit. At a 6½% rate of interest on deposits there is no profit margin.

No bank has made any formal attempt to quantify its cost of term capital (i.e. the average interest cost paid on deposit funds). From limited published data the average cost has increased from 3.65% for the June year ending 1968, to 3.89% for the June year ending 1971, an increase of only 6%. However the marginal cost of attracting capital is likely to have increased at a faster rate as a result of:

- (i) the increasing proportion of longer term time deposits;
- (ii) relaxation of interest rate controls.

¹⁴ Pers. comm. No published figures are available.

(b) Demand Deposits

The cost of attracting demand deposits may be envisaged as the cost of supplying cheque and associated services. Demand deposits have been growing at a compound rate of only 1% during the past decade (Appendix E), and the opportunity cost of maintaining idle balances is believed to be high (11.2). Costs of servicing current account balances have increased markedly as a result of:

- (i) the effects of wage inflation on a labour intensive service;
- (ii) the heavy initial costs of computer accounting.

Costs of servicing accounts vary directly with customer use. The average cost of processing one cheque is estimated to be 15 cents compared with an average return in charges of four cents. These mean estimates are subject to a large variance but most current account balances are run at a direct loss. For farm sector accounts this direct loss has increased as a result of the introduction of a uniform system of current account charges in November 1967 (Table 11.6). These uniform charges bear no relationship to costs of account servicing.

Table 11.6

Summary of Average Bank Charges
per Item Handled in the Farm Sector
 (Cents per Item)

<u>Account Description</u>	<u>Pre-1967 Charge</u>	<u>Post-1967 Charge</u>
Farmers-dairy	3.53	1.85
Farmers-sheep	3.08	2.54
Farmers-mixed	3.03	2.46

Source: Appendix to the Decision of the Trade Practices Commission in the Matter of an Inquiry into a Uniform System of Charges... by the Members of the New Zealand Bankers Assn., Wellington, 29 May 1970.

The profitability of an account will depend on the volume of idle cash and service costs. No banks have developed formal profitability evaluation methods of individual or sectoral current account balances. Bankers suggest that farm sector current account balances are "marginally profitable". Average farm sector profitability has been declining as a result of:

- (i) declining current account balances (Appendix E);
- (ii) the cost impact to the banks of the introduction of uniform charges;
- (iii) the rural branch infra-structure with its high fixed cost element necessary to service declining balances.

(c) Conclusion

Data is not available to objectively assess the direct cost of loanable funds. This cost can be identified subjectively and has been increasing in recent years as a result of interest rate liberalisation and increasing service costs in the face of near stagnant demand deposit balances. These costs vary on an inter- and intra-sector basis.

11.14 Direct Incidental Loan Costs

Direct incidental costs of granting a loan will include the costs of interviewing and investigating applicants, appraising security, closing and collecting loans and keeping records. Identification of these costs is a function of the time factor but practical problems are those of fixed cost apportionment and the theoretical inconsistency of using this approach to determine the marginal cost of a loan. No bank has yet developed a system of loan standard costing and quantitative cost estimates are not available.

The cost burden of loan administration is estimated to be heavier on smaller rather than larger loans.¹⁵ Servicing costs are not believed to vary appreciably with loan size, except in the 'fixed-variable' case where loan application is referred to Head Office. It is likely that a study of loan administration costs would reveal that the

¹⁵ Report into Management Operations of One Bank, 1971. McKinsey Management Consultants.

average cost per dollar lent of servicing a farm loan would be higher than in other sectors as:-

- (i) farm loans are generally small. The mean value of one bank's farm loans outstanding at June 30th 1971 was only \$1,700 (Table 11.7).

Table 11.7

Farm Sector Loans of One Trading
Bank Classified According to Borrowing Level

<u>Class (\$)</u>	<u>Loan (\$ volume)</u>	<u>Number</u>
Under 500	9	41
501-4,999	44	49
5,000-9,999	17	6
10,000-99,999	25	3
100,000 and over	<u>5</u>	<u>1</u>
	100	100

- (ii) farm inspection costs involve a heavy time factor.

A priori, larger loans are less expensive to service than smaller loans. On the other hand large dollar loans might result in a lower utilisation of the fixed cost element, and to restrict small loans might have the effect of discouraging small deposits.

The conclusion is that whilst direct loan cost can be identified, the difficulties of fixed-cost apportionment have precluded quantitative measurement.

11.15 The Risk Cost

A risk element (defining risk as the possibility of loan default) is an implicit loan cost (10.6). No bank has developed any objective for identifying this factor. As a result of stated resource allocation through the tier system (11.8) and an excess demand for loanable funds at the given interest rate the necessity for active field risk evaluation has not been acute. Two risk concepts can be subjectively identified - inter- and intra-sector risk.

Inter-Sector Risk: The incidence of farm sector bad debts has historically been low relative to other sectors. This has been a result of implicit Government guarantees of the industry's viability, its relative immobility, the ready saleability of farm assets and the equality of managerial and ownership control. Variation in farm sector income increases sector risk relative to other sectors (e.g. services) which have a smoother flow. This large variance has had the past effect of turning short-term self liquidating loans into "hard core". Farm sector risk will therefore increase as loanable funds become "locked in".

Intra-Sector Risk: Traditionally the order of security has determined a farm loans quality and risk content. A first mortgage over stock and chattels is considered to be prime security. A second mortgage is less attractive security and is likely to influence loanable funds allocation

in a subjective fashion. Lending to sheep farmers is generally considered to be more risky as a result of a larger income variance. A regional risk component can be subjectively identified. As a result of climatic and topographical factors, the major risky regions of rural lending are: Canterbury, North Otago, Nelson, Wairarapa, Hawkes Bay and North Auckland. Southland, Taranaki and the Waikato are considered to be less inherently risky.

11.16 Loan Costs - Summary

The economic costs of lending have been discussed (11.12 - 11.15) and identified subjectively in the practical context. In particular:

- (i) trading bank's costs of attracting funds have been increasing in recent years (11.13);
- (ii) the direct costs of making loans to the farm sector is considered to be high (11.14);
- (iii) there is an identifiable intra-farm sector risk component but risk by default is considered to be low (11.15).

There are therefore variations in loan costs and for efficient resource allocation these will be reflected in loan price.

11.17 Loan Pricing - Background

The average bank overdraft interest rate has been controlled in New Zealand since 1942. It was increased from 5.84% in August 1965 and is currently fixed at 6% (June 1971). The range of interest rates charged by banks is therefore small (Table 11.8).

Table 11.8

Volume of Loanable Funds Outstanding
at Stated Rates of Interest
 (March 1971)

<u>Rate of Interest (%)</u>	<u>Funds Volume (%)</u>
Under 5.5	3.7
5.5-5.9	43.6
6.0-6.4	10.0
6.5-6.9	17.1
7.0 and over	25.6
	<u>100.0</u>

Total loans o/s. \$749.4 m.
 Mean rate of interest 6.08%.

In addition, use of moral suasion techniques under statutory powers given to the Reserve Bank¹⁶ exhorts trading banks to lend to farmers, meat companies and the export sector at "favourable" rates. Farm sector loans are primarily made within the range of 5½% - 6½%. Interest rates are calculated on a daily basis, and the real cost of borrowing is lower

¹⁶ Reserve Bank of New Zealand Act, (1964), s.8 (ss. 1, 3); s.(31).

than this nominal cost. Direct allowance is also made in loan pricing for deposit balances. These are compensated for twice in the bank credit market. They permit initial market entry (11.4) and are allowed for in loan pricing.

In addition to interest, trading banks are permitted to charge two other loan fees, both of which are operated under a trading bank cartel. These are:

(i) The Overdraft Limit Fee

The fee is designed to prevent nominal use of large overdraft limits. It is charged (June 1971) at the rate of $\frac{1}{2}\%$ on 90% of an overdraft limit, with a rebate of $\frac{1}{2}\%$ on actual average overdraft, and a rebate of $\frac{1}{2}\%$ on actual average credit balance. Income from this fee is added to interest payments for purposes of the average rate computation above. The real effect of the fee on resource allocation and trading bank's income is therefore small. No fee is levied on limits of less than \$20,000, and it will therefore have limited farm sector application.

(ii) The Overdraft Service Fee

The fee is intended to cover the direct cost of loan account administration. The current fee scale is levied such that its incidence is heavier on smaller accounts. (Table 11.9). The relative burden is therefore

likely to be heavier on small farm sector loans. However it has been argued that there is no strong relationship between loan volume and variable administrative cost (11.7).

Table 11.9

Scale of Overdraft Service Fees
(June 1971)

<u>Overdraft Limit</u> (<u>\$</u>)	<u>Fee Range</u> (<u>\$</u>)
Under 600	0- 6
601- 1,000	6- 8
1,001- 2,000	8-10
2,001- 10,000	10-12
10,000-100,000	12-60
Over 100,000	\$100

11.18 Opportunity Cost of Funds Allocation

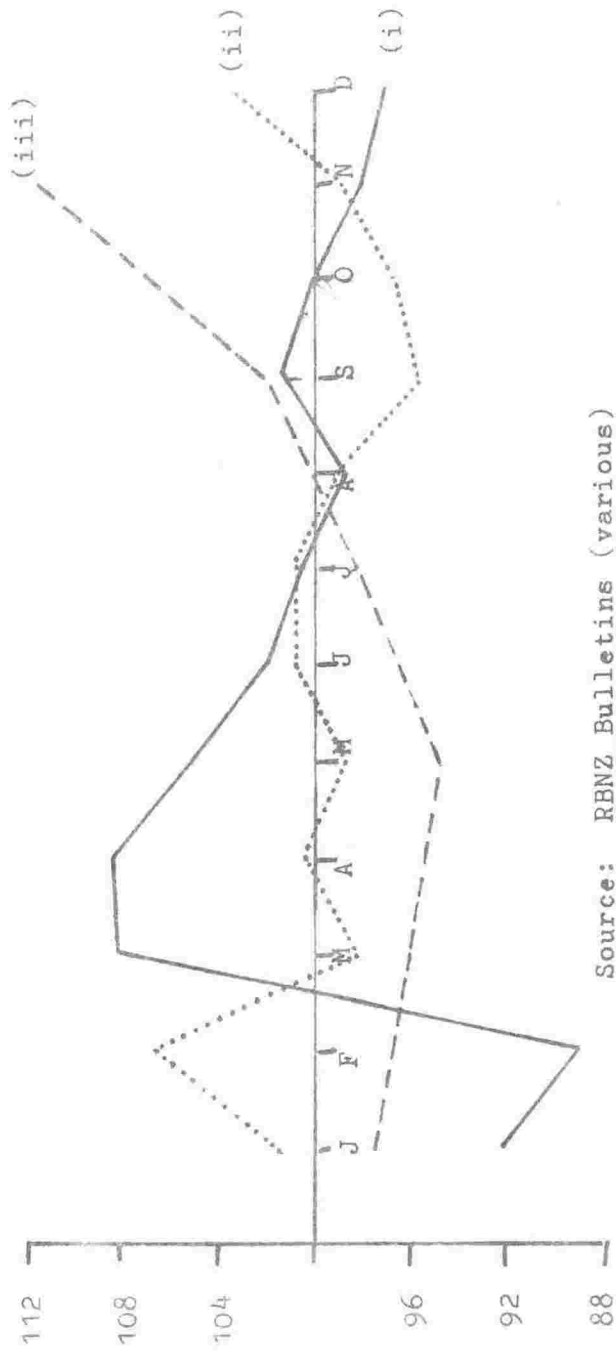
The costs of and direct returns from loans have been discussed (11.12 - 11.17). For an efficient resource allocation, sector loan returns and costs should be equal at the margin, and the opportunity cost of funds allocation should be equal (10.3). To assess market efficiency the opportunity cost of resource allocation needs to be identified given that:

(i) the average overdraft interest rate is fixed (11.17);

(ii) there is an excess demand for funds at this rate (10.7(c));

Fig. 11.1 Seasonal Indices 1963-70

(i) All Bank Advances.
(ii) Advances to agriculture (excl. farm services, forestry, fishing etc).
(iii) All Bank Deposits.



Source: RBNZ Bulletins (various)

- (iii) there is a seasonal flow of advances and demand deposits.

Under these institutional circumstances, borrowers prepared merely to pay the given market rate are of no real economic significance to trading banks. An aggregate approach is necessary, and the real profitability of a sector's borrowing will depend on:

- (i) the rate of interest charged;
- (ii) the amount borrowed;
- (iii) the volume of overseas exchange business attaching to a sector's **borrowing**. Trading banks agree that this is their most profitable business activity;
- (iv) the volume of deposit business attaching to an account;
- (v) the timing of advance and deposit flow, in relation to seasonal demands for and receipts of aggregate funds.

A formal procedure for evaluating **sectoral** (or **an individual account's**) net worth under these conditions has been developed (Table 11.10). Monthly weighting indices are calculated to give a heavier weighting to off-peak borrowing and to deposit balances in periods of liquidity shortage. The weighting index is based on the inverse of the monthly aggregate seasonal index (Fig. 11.1), and reflects an economic cost approach. The calculated net worth of a sector's business should exceed the direct incidental cost of administering that sector's business, any risk factor, and in aggregate cover fixed costs.

Table 11.10

Formal Sector Account Worth Evaluation
Procedure (Yearly Basis)

- (i) Weighted monthly average overdraft $\frac{12 \sum \text{index} \cdot \text{overdraft}}{1 = \text{Jan.} \quad 12}$
- (ii) Actual interest earnings on overdraft balances
- (iii) Actual overseas exchange earnings.
- (iv) Imputed interest on deposit balances $\frac{12 \sum \text{index} \cdot \text{balances}}{1 = \text{Jan.} \quad 12}$
- (v) Earnings (ii) + (iii) + (iv)
- (vi) (a) Direct incidental loan costs
 (b) Direct costs of maintaining deposit business.
- (vii) (v) less (vi) as a percentage of (i)
- (viii) less rate of interest to be earned on any account
 (average overdraft interest rate).
- (ix) Net worth of sector overdraft business (as a %).

The method is not conceptually ideal as a method of business evaluation as it has been developed within the constraints of a given financial environment. It is static and a dynamic evaluation procedure, based on future business discounting would be more in accordance with accepted economic principles. It is based on ex-post data and can only give a guide to future funds allocation, given present constraints.

Ideal data is not available, but the net worth of farm sector business to trading banks has been calculated on this basis between 1963 and 1970. (Table 11.11). Calculations are based on the assumptions that:

- (i) linear interpolation provides a reasonable estimate where data is unavailable;
- (ii) the farm sector is charged a concessionary rate of interest, at $\frac{1}{2}\%$ below average overdraft interest rate (11.17%);
- (iii) interest on weighted deposit balances is credited at 3% for the period;
- (iv) the effect of time deposits is ignored. This is because of data inavailability;
- (v) farm sector direct foreign exchange earnings are zero.

Table 11.11

Farm Sector Net Worth to Trading Banks
(1963-1970; Calendar Year)

<u>Calendar Year</u>	<u>1963</u>	<u>1964</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>
(i) weighted monthly o/d bals. (\$m)	63.0	59.7	62.7	65.3	70.0	71.8	74.9	79.2
(ii) actual interest earnings (\$m)	3.35	3.22	3.45	3.60	3.85	3.98	4.08	4.36
(iii) weighted deposit bals. (\$m)	96.6	104.3	102.5	95.9	84.5	83.3	83.2	81.8
(iv) imputed interest on deposits (\$m)	2.90	3.13	3.08	2.88	2.54	2.50	2.50	2.45
(v) Total earnings (\$m)	6.25	6.35	6.53	6.48	6.39	6.48	6.58	6.81
(vi) earnings as % of (i)	9.92	10.64	10.40	9.92	9.13	9.03	8.79	8.60
(vii) <u>less</u> ave. o/d interest rate (%)	5.80	5.80	5.90	6.00	6.00	6.00	6.00	6.00
(viii) Net worth of sector business (%) ¹	4.12	4.84	4.50	3.92	3.13	3.03	2.79	2.66

Note ¹: to cover direct costs of maintaining sector business, any risk factor, and fixed cost apportionment.

Comparisons are made with the calculated net worth of other sectors. (Table 11.12). Calculations are ex-post average measures, rather than ex-ante marginal measures but trends can be compared.

Table 11.12

Net Worth of Selected Sectors to Trading Banks
(1963 - 1970; Calendar Year)

<u>Calendar Year</u>	<u>1963</u>	<u>1964</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>
Agriculture	4.12	4.84	4.50	3.92	3.13	3.03	2.79	2.66
Manufacturing	1.82	1.93	1.84	1.81	1.66	1.96	2.03	1.77
Personal	11.14	10.93	10.43	11.19	11.89	11.82	10.55	10.40
Commerce, Trade and Finance	4.29	4.22	3.49	3.31	3.13	3.72	3.43	3.19
Services	21.27	20.95	20.15	20.55	19.96	18.33	17.81	17.56
Construction	4.48	4.25	3.80	4.46	4.45	4.30	4.22	3.81

Notes:

- (i) Source of data - Reserve Bank of New Zealand Bulletin, and Trading Banks, pers. comm;
- (ii) the effects of time deposits are ignored;
- (iii) estimates of overseas exchange earnings have been made from information given by bankers.

As a result of large deposit balances relative to advances, the net worth of the services and personal sectors are high. The manufacturing sector has the lowest calculated net worth, as a result of heavy borrowings in relation to deposits, and at peak times. From Table 11.12, the net worth of farm sector business is proving to be increasingly unattractive to the trading banks.

Under institutional constraints and a static environment, an efficient allocation of loanable funds by trading banks might be achieved by equating the net worth of all sector business. From Table 11.12, there is considerable imbalance under present allocation. A change in sectoral net worth can be achieved by:

- (i) increasing/decreasing advances outstanding;
- (ii) stimulating/discouraging deposit balances;
- (iii) stimulating/discouraging overseas exchange business;
- (iv) manipulation of advances/deposits timing;
- (v) adjustment of interest rates.

Ceteris paribus, from the trading banks viewpoint resources should be diverted away from the farm sector to the personal and services sectors, or the net worth of farm sector business should be stimulated through methods (i) to (v) above.

In recent years farm sector deposits have been exhibiting a downward secular trend (Appendix E). Trading banks consider that it is unlikely that this trend will reverse. Farm sector advances indicate a peak in the spring and early summer and deposits are increasing when banks are experiencing an aggregate liquidity shortage. As a result of the farm cyclical pattern, it is unlikely that timing could be adjusted to favour the sector any more than at present. Measures to increase farm sector net worth are therefore limited to (i) and (v) above.

11.19 Marginal Pricing

The observed net worth inequality suggests that marginal pricing is not utilised in the market (11.18). Efficiency of funds allocation at the margin is a function of (10.7(b)):

(i) the Equating of Loan Cost with Loan Price

Interest rate control precludes automatic adjustment of cost and price. The study has shown that:

- (a) there has been an increasing disparity between the average and marginal costs of attracting deposits (11.13) and the average rate of interest charged on loans (11.17);
- (b) the small range of interest rates effectively allowed does not facilitate price rationing;
- (c) other methods of funds allocation have been developed.

The tier system is the major allocative device (11.18). Given this system the volume of deposit balances and the extent of overseas exchange business are the devices (11.18). An excess demand for funds at below equilibrium

interest rates has necessitated the security factor to be the initial rationing device (11.5(iv)).

(ii) the Equating of Service Costs with Service Fees

The rigid overdraft service fee scale (11.17) is not related to cost. A service fee is not charged where loan application is refused, even though this processing involves a direct cost. A more efficient cost apportionment system in theory would involve:

- (a) a loan application fee being charged commensurate with direct loan processing cost. For example, an initial fee would be greater than a subsequent fee, since some credit history would be compiled;
- (b) a loan service fee being charged to cover direct administration cost.

Under this system, the cost to the farm sector would be likely to increase (11.14). However this separation of charges has the theoretical effect of inducing a more specific identification of cost at the margin.

11.20 The Ex-Post Efficiency of the Market: Appraisal and
Conclusions

Both conduct (11.2-11.11) and pricing (11.12-11.19) aspects have been examined with reference to the farm sector.

(a) Conduct Aspects

Three observable features comply with perfect market conditions (10.2):

- (i) loanable funds are a scarce commodity;
- (ii) as interest rates are controlled (11.17), buyers and sellers can only influence price marginally;
- (iii) trading banks offer practically identical services and facilities (11.12).

A number of behavioural factors have been observed that represent deviations from this perfectly competitive state:

- (i) positive consumer loyalty is a factor (11.3), but is unlikely to influence market efficiency;
 - (ii) information supplied by farmer borrowers is incomplete (11.6). In individual cases, funds are not forthcoming for what may be a sound project;
 - (iii) market information utilised by banks is largely restricted to that internally generated (11.5).
- This has the effect of restricting the information

- basis on which a dynamic allocation of resources could be guided;
- (iv) there are a few large sellers (11.1). This permits an easier and more effective use of cartel price (11.17) which may raise prices to some borrowers, and over-rule marginal identification;
 - (v) entry to the borrowing market is restricted (11.4). Security requirements, past credit history and deposit balances are all entry requirements. These factors ensure that ex-ante funds are allocated on the basis of ex-post criteria. This is inconsistent with a dynamic efficient allocation process;
 - (vi) the market is split into uniquely identifiable segments as a direct result of the tier system of monetary control. The distorting effects of this mechanism have been discussed (11.8), and its effect has been that resources are artificially diverted to the farm sector. The tier system is inconsistent with an efficient allocation process.

(b) Pricing Aspects

The distortions created by the tier system have been accentuated by interest rate controls (11.17), that have also favoured the farm sector. This control has effectively prevented actual

utilisation of marginal pricing (11.19), even though cost variations have been identified (11.14 - 11.15). The interest rate and tier controls have attracted and trapped funds within the farm sector and as a result the net worth of the farm sector to trading banks has been declining (11.18). Relaxation of these controls is necessary for a more efficient distribution of resources through ex-ante discounting and price rationing. This relaxation would have effects on the availability of funds to the farm sector:-

- (i) the rate of growth in the volume of bank lending to the farm sector would decline;
- (ii) there would be an upward drift in farm sector interest rates and in all interest rates, but with a wider margin than at present.

The effect of these two adjustments would be to increase the net worth of the farm sector to the trading banks. The diversion of loanable funds to other sectors, in particular the personal and services sectors, would lead to a closer alignment of net worth indices and a more efficient ex-post resource allocation, under the institutional environment.

11.21 A Note on Term Loans

Term loan finance has not been investigated in detail. This loan facility was introduced in 1963¹⁷ and offered trading banks the opportunity to make loans of fixed duration. Up to October 1970, strict quantitative controls were maintained on aggregate lending, and the sector allocation was predetermined by the Monetary Authorities. Since that time term loans have been free from quantitative restriction but subject to lower tier control.¹⁸ The effect has been an increase in term lending relative to overdraft lending. The farm sector has not benefited from this control relaxation as:

- (i) interest rate controls are not imposed on term lending. Market rates are charged and these are greater than the farm sector has traditionally been accustomed to pay;
- (ii) term lending is subject to lower tier control. Bankers are reluctant to lend to the farm sector on this basis, when they are able to provide farm sector finance on an overdraft basis without penalty. As a result of these institutional

¹⁷ "Statement by the Minister on Term Lending", Reserve Bank of New Zealand Bulletin, XXVI, No. 1 (Jan. 1963), p. 7.

¹⁸ Statement by Minister, 27 October 1970, op. cit., p. 16.

constraints, bankers believe that under present conditions the farm sector will be virtually excluded from access to this source of medium term capital.

CHAPTER TWELVE Sources of Farm Finance -

Stock Firms

12.1 Introduction

The nature of the stock firms' relationship with farmers has been discussed (Chapter Six). Stock firms are the predominant short term financiers of New Zealand agriculture, by dollar volume (Table 12.1), and also hold substantial farm sector deposits.

Table 12.1

Stock Firm and Trading Bank Advances to,
and Deposits from the Farm Sector
(\$m)

<u>As at</u> <u>June 30th</u>	<u>Stock firm</u> <u>Advances</u>	<u>T.B. Advances</u>	<u>S.F. Deposits</u> ¹	<u>T.B. Deposits</u> ²
1966	107	68	59	118
1967	107	71	54	106
1968	104	74	58	107
1969	108	78	69	110
1970	112	88	76	92
1971	140	99	72	95

¹ Mainly farmers; no detailed breakdown is available.

² Includes an estimate of farm sector time deposits.

In recent years stock firms have increasingly endeavoured to diversify their activities laterally, partially to spread the risk of portfolio asset allocation, and partially to take advantage of developing investment outlets in a growing economy. For instance, one national

company has diversified into activities such as motor trading, home appliance manufacture, restaurant trading and land development. The farm sector is therefore competing with other sectors for funds and the efficiency criterion is that stock firms equate the marginal return with marginal cost of sector business. Alternatively this criterion may be expressed as an equation of the opportunity cost of funds allocated to each sector. The profit maximisation assumption is therefore made.

Average and marginal returns from lending to the farm sector will result primarily from business generated since stock firms readily accept at the outset the hypothesis that farm lending is a necessary precondition to sales stimulation and retention, rather than a profitable use of funds in itself.

Examination of the market is treated such that emphasis is placed primarily on the efficiency of lending to farmers under the present market structure, rather than a determination of equilibrium efficiency as defined above. An aggregate firm approach has been adopted, even though the variance of individual stock firm behaviour is greater than in the banking sector.

A MARKET STRUCTURE

12.2 Market Actors

There are three national stock firms in New Zealand and 16 smaller companies, but the study has been limited

to an examination of the market behaviour of the three national companies and two largest regional companies. The degree of market concentration is high. Based on the handling of the New Zealand Wool Clip in the 1969-70 season, these five firms account for 72% of farm sector business volume. Some market structural parameters are presented below (Table 12.2).

Table 12.2

Market Structural Parameters of Investigated Stock

	<u>Firms</u> (June 1971)				
	<u>Nat. A</u>	<u>Nat. B</u>	<u>Nat. C</u>	<u>Reg. D</u>	<u>Reg. E</u>
(i) No. of "rural" accounts	30,000	35,000	N/A	4,400	4,000
(ii) No. of "farmer" accounts	9,000	11,250	N/A	2,000	1,800
(iii) (ii) as % of (i)	30	32	N/A	45	45
(iv) No. of secured "farmer" accounts	1,500	1,500	N/A	1,050	900
(v) (iv) as % of (ii)	16.6	13.4	N/A	31	50

Notes:

- (i) This and subsequent information has been given on the understanding that confidentiality is maintained and direct reference is not made to individual companies;
- (ii) All figures are estimates, apart from (iv) which were taken from company records at the date of interview;
- (iii) "Rural" accounts includes ALL accounts related to traditional stock and station agent business. The number will include permanent and sundry farmer clients, butchers, retailers etc;
- (iv) "Farmer" accounts covers farmer clients who deal "substantially" with stated stock firm. Some double counting is likely to be inevitable.

The distribution pattern of advances at date of interview of two stock firms (Table 12.3) are broadly comparable.

Table 12.3

Distribution Pattern of Customers - Two Stock Firms
(June 1971)

	<u>Nat. B</u>	<u>Reg. D</u>
(1) No. of "farmer" accounts	11,250	2,000
<u>Proportion of (1) - %</u>		
(2) Primarily cash payments	40	48
(3) Seasonally financed (up to \$2,000)	33	27
(4) Primarily financed (\$2-7,000)	20	17
(5) Heavily indebted* (generally secured)	<u>7</u>	<u>8</u>
	100	100

* Average debt approximately \$10,000; Range from \$7-30,000.

These structural parameters indicate that:

- (i) there are a high proportion of "farmer" accounts where payment is made in cash, and no stock firm finance is involved;
- (ii) regional companies show a higher proportion of farmer to rural accounts. They cater relatively less for "sundry" business than the national firms;
- (iii) a higher proportion of regional company accounts are secured. This observation has implications for resource allocation (12.14).

B MARKET CHARACTERISTICS

12.3 Product Differentiation - Advertising

Formal advertising techniques utilised by stock firms to attract farm business are defensive and selective in nature. Provincial newspapers, farming magazines and company newspapers are the prime media. There is fundamentally little difference between services and facilities provided by stock firms and this advertising has limited effect on business stimulation and transfer. Aggressive advertising is carried out through the use of representatives calling at the farm gate. This activity is designed to foster inter-firm heterogeneity, based on speed and quality of service. Emphasis is placed by stock firms on the personal qualities of the representative as his ability is critical in influencing both real and artificial product differentiation. The operation of a price cartel, with fixed industry commission charges precludes price variation as an effective competitive device. Inter-firm competition is therefore limited to the service factor. Formal advertising whilst a feature of imperfect competition, is therefore unlikely to affect the efficiency of resource allocation within the farm credit market.

Stock firms do not advertise for prospective borrowers. As lending is necessary to attract some business, clients who pay cash may be envisaged as having a higher worth to their company. Stock firms also do not formally advertise for customers' deposits, even though they offer deposit facilities and these balances do represent a source of capital. The development of the deposit facility has been a function of historical circumstance. One national firm isolates all farm deposit funds received from the company's general funds pool. As this company therefore neutralises any potential **advantage** of this source of capital, advertising would be of little benefit. On the other hand other companies do use these balances more aggressively, and they will therefore affect the **cost** of capital (Table 12.4) and the net worth of clients (12.7). In these circumstances, formal advertising for deposit funds might be profitable. Tradition and word of mouth are major advertising methods currently used by firms to attract deposits.

12.4 Consumer Loyalty

Tradition has been observed to be an important factor influencing stock firm choice (6.3). Stock firms confirm that positive loyalty is a feature of the relationship between them and their farmer clients. Loyalty of some clients will be enforced as a result of the terms of the stock and chattels mortgage device (12.4),

but stock firms believe that loyalty stems from service and tradition rather than financial factors. Farm sector loyalty is considered to be more pronounced than loyalty exhibited by other sectors, such as car buyers or retailers, and a feature of South Island rather than North Island business. No quantitative estimates have been made by firms of customer loyalty. Under conditions of perfect competition neutral loyalty is the norm and positive farm sector loyalty will have an effect on resource allocation. Farmers will be reluctant, for instance, to transfer their business in the short term to a more efficient firm. In cases where they are financially committed it may be difficult for them to do so.

12.5 Freedom of Market Entry and Exit

This is a necessary efficiency condition (10.3). The heavy fixed capital costs of market entry for a stock firm are at present incompatible with the rate of growth of farm sector business and new sellers are therefore unlikely. Indeed, through the evolutionary market amalgamation process and practice of "the survival of the fittest" doctrine, the degree of market concentration is more likely to increase. One national firm particularly has expanded almost entirely as a result of horizontal integration.

Free market entry and exit is assured to the farmer client who pays for services and requisites in cash. Free movement of heavily committed clients is restricted as a

result of security devices (12.14). New farmer clients who require credit facilities to finance purchases are subject to entry vetting procedures. The three national companies all vet new borrowers as follows:

Company A: All new clients who require finance are referred to Head Office. A statement of assets and liabilities and a property report accompanies each reference.

Company B: All new clients who require seasonal finance of initial sums greater than \$2,500 are referred to Head Office. A branch managerial discretion is allowed for sums less than \$2,500. All clients requiring term finance are referred to Head Office.

Company C: Similar to B above; managerial discretion \$4,000.

Entry to the loanable funds market is in essence centrally controlled. The ease or difficulty of entry will be a function of new business anticipated (a dynamic consideration), the firm's liquidity position and the general economic climate prevailing. The weighting of those factors will be variable but will preclude unrestricted entry to the loanable funds market.

12.6 Market Information - Stock Firms

Four classes of market information have been identified (11.5) and the conclusion reached that information actively utilised by the banking sector is generated within

that sector. There is a similar observation with respect to stock firms.

"On the job" training and internal promotion is the norm. Recruitment of staff is localised, particularly for the two provincial firms where recruitment is limited entirely to the local labour market. Apart from regular managerial conferences, at which policy questions are discussed, no firm has any formal training programme. As a result, the experience of stock firm managerial staff is one of an overwhelming emphasis on practical training in trading, rather than in business principles. This has led to an identification problem. The goals of stock firm branch managers as a whole are thought to be sales maximisation rather than profit maximisation (12.1), and client retention, regardless of economic costs involved. In particular provincial managers are thought to be unaware of:

- (i) alternative uses of funds within the Company;
- (ii) the costs associated with increasing sales and financial commitment to the farm sector. As a result, branch managers themselves may actively encourage in complete unawareness, a misallocation of resources.

The effect of this goal dichotomy between a firm's policy makers and it's implementors has led one national company to

recognise the need for formal business training of senior staff. The decision to introduce training has however been considered and deferred. Such training, based on the premise that stock firms are faced with a variety of resource uses, would be likely to lead to a greater appreciation of an efficient allocation of funds.

New funds opportunities by definition are only recognised as a result of information injection into the stock firm sector, but farm lending policy is based primarily on information internally generated. One senior executive stated that:

"... Farm lending policy is based solely on the practical situation on the farm (as evidenced by the financial position of that firm's customers) and expected income levels on the farm..."

There was some felt need by firms to assess future commodity market prospects and price levels but published farm sector information (e.g. overseas trading reports, producer board reports) is not utilised. An exception is the use made by one company of external information on the economic climate to determine critical parameters for target budgeting purposes.

The problems of utilising internally generated information only have been discussed (11.5). This restricted information utilisation may induce inefficiency, since the planning horizon will tend to be limited, and discovery of new market opportunities will not be assured as speedily as possible.

12.7 Specific Information and Loan Control

Stock firms request similar information to trading banks in the individual loan application (11.5). National companies are increasingly relying on the use of annual budgets and cash flow statements in support of an application for finance. In interpretation of this information emphasis is placed on:

- (i) the credit-worthiness of the borrower;
- (ii) the timing of the advance and the volume of funds required;
- (iii) the profitability through increased business of the advance.

Unless credit is arranged, an account becomes payable upon expiry of the traditional "free credit" period.¹ All national companies operate a discretionary advance limit system and rural limits are generally higher than those operating in the banking sector. As stock firms are not faced with the need to comply with credit control regulations, centralised control at the outset is not as necessary as in the banking sector. However all firms maintain subsequent advance control centrally.

¹ For example, "Fourteen Days", "21st of the Month".

For example, one national company refers to Head Office for vetting all temporary advances of regular clients greater than \$200, and outstanding for longer than three months. The separate process of granting and controlling loans may induce an excessive allocation of loanable resources to the farm sector as:

- (i) initial control of advances is exercised at branch level where goals are believed to be at variance with overall company goals. (12.6);
- (ii) there are practical and social problems arising from an immediate repayment request as a result of an ex-post misallocation.

The possible distorting effect of this split procedure was not observed in the case of the two regional companies. For these companies granting and control of all new and existing loan business was centralised.

In conclusion, the role of market information has been briefly examined. Despite extensive probing all stock firms considered that macro and micro farm sector information was adequate. As a result of their long history of operations within the farm sector, more historical information was available to them on farm sector activities than on other activities. Particularly at lower management levels this state has led to an internal resistance to diversification, and ex-post and ex-ante resources may continue to

be devoted to agricultural financing as a result of inertia.

12.8 Market Information - Farmer Borrowers

Four classes of farmer client can be identified:

- (i) the client entirely committed to his firm as his "banker";
- (ii) the client with a bank account, whose borrowing is conducted primarily through his stock firm;
- (iii) the client with split borrowing business;
- (iv) the client who pays cash, and who may borrow from his bank.

Class (iv) is not considered as it is irrelevant in the context of the stock firm farm credit market.

On (i): A traditional function of stock firms particularly in the South Island, has been to act as a banker for clients. This facility is now discouraged and no new accounts are taken on by the national companies but farmers who do use full facilities are voluntarily tied to their stock firms. It is unlikely that these clients will have any knowledge of alternative credit sources.

On (ii) and (iii): Farm sector loyalty to stock firms has been observed (12.4). This will preclude detailed knowledge of alternative borrowing potential. In any case the ability of an individual farmer to borrow from other firms is limited as:

- (a) loanable funds are theoretically allocated in conjunction with anticipated ex-ante trading business. A search for alternative credit sources must be associated with a spread or total transfer of business;
- (b) stock firms maintain an unofficial internal contact network to determine the extent of a customer's borrowing and business split;
- (c) stock firms maintain an official information exchange network within their Association² at local and national level through the "Account Callover" system. This system is designed to isolate farmer clients with debit balances at various firms;
- (d) the inter-firm commission agreement on secured clients (12.14) will limit their ability to transfer business.

The operation of these factors ensures that farmers are not able to borrow extensively and are therefore likely to lack inter-firm knowledge of borrowing potential.

It is easier for farmers to gain knowledge of their trading bank borrowing potential. The banking and stock firm sectors are interested in fundamentally different collateral

² The New Zealand Stock and Station Agents Association is a pressure cell with the function of co-ordinating and planning the industry's strategy and public behaviour.

business. Even so, stock firms collectively feel that a customer with a bank and stock firm account will tend to borrow from the firm. The potential availability of this knowledge is therefore not extensively utilised.

The Credit Survey (6.9) showed that a high proportion of stock firm borrowers considered the cost of borrowing to be high. Stock firms confirm that an increasing proportion of farmers are aware of the differential between the stock firm and trading bank rate of interest, though this small differential alone was insufficient to stimulate a radical adjustment of financial behaviour.

The conclusion is that stock firm borrowers do lack knowledge of the availability of alternative credit sources, though many are aware of an interest rate differential over trading banks.

12.9 Sub-Market Identification

It has been shown (11.8) that the market for bank credit is uniquely identified as a result of the tier system of monetary control. Market separation in the stock firm sector is not as necessary but may result from:

- (i) inter-sector separation, as a result of the demand for funds from various sectors (12.9);
- (ii) intra-sector separation as a result of:
 - (a) interest-inelasticity of demand;
 - (b) split borrowing (12.10).

Stock firm funds may be utilised in a number of ways: for the purchase of fixed assets (i.e. direct investment, or the purchase of a controlling interest in other companies), term investment (i.e. the purchase of shares in other companies), increasing debtors or stocks, increasing bank balances and for other minor purposes. It is suggested (12.1) that the opportunity costs of use of funds in these ways must be equalised. It is primarily necessary to observe whether these uses are uniquely identified.

Fixed asset purchase and/or term investment is necessary for sustained business growth. The proportion of funds utilised from year to year for takeover purposes and term investment, in particular, is likely to have a large variance as new market opportunities cannot be planned for in any flow fashion. This variance hypothesis is supported by an empirical funds flow statement prepared for one stock firm (Table 12.4). The statement also indicates that there is some inverse relationship between the annual ex-post proportion of funds utilised for fixed asset purchase and term investment, and funds utilised to increase debtors, i.e. funds allocated primarily to the farm sector. That is, in years when asset purchase has been heavy, the relative proportion of funds utilised in increasing debtors is lower. This statement (Table 12.4) does not however indicate funds volume.

Table 12.4

Sources and Uses of Funds¹ - National Stock and Station Agent Company
(Expressed as a Proportion)

<u>Sources of Funds</u>	Y/e 30th June	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970
Profits and depreciation reserve (after tax and dividends)		13.8	10.8	20.9	44.7	19.4	23.6	17.6	27.9	27.1	29.9
Reserves and Ordinary Shares		23.9	1.9	-	5.9	50.4	17.1	1.1	2.2	3.3	4.2
Term Loans		46.3	45.0	16.9	13.8	6.3	33.2	50.3	36.1	20.2	8.1
Customers Deposits (mainly farmers)		15.0	5.9	29.8	21.2	18.2	4.1	-	21.3	34.7	13.9
Bank ³		1.0	35.0	-	4.3	-	15.0	28.7	-	-	33.9
Other		100.0	1.4	32.4	10.1	6.7	7.0	2.3	12.5	14.7	10.0
<u>Use of Funds</u>		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Fixed Assets ⁴		49.2	43.3	44.2	38.0	30.0	45.9	51.9	53.5	39.4	22.6
Term Investments ⁵		4.9	-	-	-	-	10.3	9.2	1.0	3.6	50.8
Debtors (mainly farmers)		16.3	23.6	-	29.9	40.9	20.6	1.3	-	32.7	13.6
Customers deposits (mainly farmers)		20.4	-	-	-	-	-	6.9	-	-	-
Bank ⁶		-	-	45.7	-	10.6	-	-	31.0	15.7	-
Other		9.2	33.1	10.1	32.1	18.5	33.2	31.7	14.5	9.6	13.0
		100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Notes:

- 1 defining funds as working capital;
- 2 includes debenture stock, mortgages on property and fixed deposits;
- 3 includes cash, Government stock, minority interests, sale of shares in associated companies, debtors, trade creditors and stock in trade;
- 4 includes own fixed assets and full purchase of subsidiaries;
- 5 mainly shares, and convertible notes in associated companies;
- 6 cash, Government and local body stock, minor investments, stock in trade and trade creditors.

It appeared from interview that attempts are being made to instil into branch managers of national companies an increasing awareness of alternative funds uses. This education process is impaired as:

- (i) there is an incompatibility in goal structure. The major goal of branch managers is sales maximisation (12.6), but increasing debtors is associated with sales increase;
- (ii) branch managers do have intimate contact with the "rural" aspects of a stock firm's business. They do not have a policy formation role. In addition they do not generally have authority to spend funds that are diverted to other sectors. It is probable that there is a loss of personal identity and prestige as funds are increasingly diverted to other sectors. This will have a restraining effect on branch managers conception of and perception of alternative funds uses.

At Head Office level, an attempt to identify the markets for stock firm funds is made through use of budgeting techniques. These are increasingly becoming an important aspect of two national companies' financial planning and control procedures. The technique has not been developed to any sophisticated level by the regional companies, both of whom are faced with an essentially

less complicated funds allocation problem.

Budget forecasts are prepared by the two national companies to estimate cash flow, profit and likely capital expenditure. Budgets are not utilised to fix and control aggregate and branch expenditure limits. In particular, whilst estimates are made of farm advances, these estimates are not mandatory. Actual debt levels outstanding are controlled by other measures (see below), such as regular account reviews. Budgets are prepared at branch level to cover a 12 month forecasting period, in the first instance. Subsequently monthly aggregate budgets are prepared at Head Office level. At branch level the budgeting system is designed to generate estimates of trading parameters, and the design of budget forms and requests for information do not facilitate estimation of alternative non-farm sector uses of funds. These are not relevant at that primary information input level anyway. Monthly aggregate and branch budgets are subsequently compared with actual market performance. In particular, the variance of branch budgeted "farm debtors" figure from the actual level has for both firms been historically large. This is thought to be as a result of:

- (i) lack of care and experience at branch level in the use of budgeting techniques. In particular, insufficient account is taken of the debtors-sales relationship.

- (ii) variation in non-controllable causal factors, such as the effect of drought, sharply falling prices;
- (iii) alternative means of advance control. This is through a labour intensive account appraisal method. The advance control procedures of the five investigated companies are:

National Company A: All accounts greater than \$200 are referred quarterly to Head Office for review.

National Company B: All accounts with a debit balance are referred to Head Office for quarterly review.

National Company C: All accounts with a debit balance of \$2,000 and greater are referred to Head Office monthly. All applications for interest and mortgage instalment payments are referred to Head Office immediately and all accounts annually.

Regional Company D: All accounts with a debit balance are inspected in March. This allows three months (to 30th June balance date) to achieve the goal of minimum aggregate advance balances. All accounts owing greater than \$5,000 are referred to Head Office monthly.

Regional Company E: "Heavily indebted" accounts referred to Head Office on an ad hoc basis. All accounts referred to Head Office annually.

The broad effect of divorce of the control of farm lending from the budgetary system is to limit the effective use of

the budgeting technique as a means of funds use identification. However the very reliance of budget forecasting on the ex-ante interpolation of largely historical data will preclude identification of new market opportunities or funds uses. Identification of new funds uses will originate largely from Head Office and will be a function of market opportunities and their perception. These opportunities if acted upon will demand immediate structural adjustment to funds budgets, and will affect funds flow to already identified market sectors. It is therefore not possible to uniquely identify in the dynamic context, markets for stock firm resources. In the static situation budgets will identify uses, but in practice financial control of farm lending is divorced from this tool.

12.10 Sub-Market Identification - Other

It is also difficult to uniquely identify aspects of the intra-farm sector demand for stock-firm funds. The narrow range of interest rates currently charged by stock firms precludes isolation of borrowing markets defined according to interest elasticity. In any case at the margin the availability of funds is considered to be of greater significance than interest cost. One senior executive commented that

"... some farmers are prepared to pay any rate of interest..."

Split trading bank and stock-firm borrowing as adopted by some farmers may in theory be envisaged as permitting the identification of two sub-markets. Such possible market separation is unlikely to foster a state of market discrimination as:

- (i) trading banks and stock firms are interested in fundamentally different collateral business;
- (ii) stock firms are willing to allow trading banks to assume an increasing responsibility as sources of farm finance. No firm actively pursues a policy of encouraging clients to obtain finance from trading banks, but it is likely that a policy of closer collaboration between these institutions will increasingly develop;
- (iii) from (ii) above, no stock firm attempts to attract loan business at the expense of trading banks.

Whilst split-level borrowing will increase economic costs to the stock firm an increasing proportion of borrowing from trading banks will increase the net worth (12.17) of an account. This increase is likely to offset any increase in economic cost. Ceteris paribus, these costs will be at a maximum when borrowing is divided on an equal basis between a bank and stock firm. Discriminatory behaviour as a result of the operations of the

trading banks in the stock firm farm credit market cannot however be identified.

C MARKET CONDUCT - PRICING ASPECTS

12.11 Introduction

The efficiency of funds allocation to the farm sector by stock firms is examined:

- (i) through the marginal cost-marginal revenue approach (12.12 - 12.16);
- (ii) through the opportunity cost approach, (12.17).

The marginal approach necessitates the identification of loan cost components, viz. the direct cost (12.12) incidental direct cost (12.13), and risk cost (12.14).

12.12 Direct Cost of Loanable Funds

The direct cost of loanable funds is equated with the "cost of capital" concept. A company's average cost of capital is defined to include the rate of dividend payment on ordinary³ and preference shares, the rate of interest on debentures and fixed deposits, and the current rate of interest on average stock firm overdraft with trading banks. In addition the cost of retaining call and customers' credit balances is included. These balances

³ The effect of tax on the determination of the "real" dividend rate has been assessed. The real cost of dividend maintenance is assumed to be double the declared rate, given the company tax rate of 50c. in the \$1.

originate primarily from the farm sector, and have had the effect of reducing the real cost of capital of all stock firms investigated (Table 12.5).

Table 12.5

Estimated Average Cost of Capital of Five Stock Firms During
the Year Ending 30th June 1970¹ (as a percentage)

	<u>Nat. A</u>	<u>Nat. B</u>	<u>Nat. C</u>	<u>Reg. D</u>	<u>Reg. E</u>
(1) Nominal cost of capital ³ (excluding call and credit balances)	11.68	11.17	10.76	16.14 ²	11.95
(2) Modified cost of capital ³ (including call and credit balances)	9.71	7.89	8.78	9.98 ²	8.24
(3) Reduction in cost $\frac{(1) - (2)}{(1)}$ as a %	16.90	34.73	18.20	38.17	31.05

- Notes:
- (1) Data source - published Balance Sheet data and/or pers. comm.
 - (2) Cost of capital calculation includes rebates on purchases paid to ordinary shareholders.
 - (3) Weighted average on basis of:
 - (a) permanent capital outstanding at balance sheet date;
 - (b) variable capital (such as bank overdraft) at average balance through the year.

There has been marginal variation in the ex-post average cost of capital to companies in recent years. This has been a function of the manner in which new capital has been raised. For instance, this estimated nominal cost to Company C above has been 11.61% (year ending 30th June 1965), 12.04% (1966), 11.74% (1967), 11.39% (1968), 11.23% (1969), and 10.76% (1970). Two observations are apparent:

- (i) National companies have tried to raise capital through debenture issue, rather than through ordinary shares. The issued ordinary share capital of Company C has increased by 9.3% between 1965 and 1970 from \$13.7m. to \$14.9m., whereas issued debenture stock outstanding has risen by 209.8% from \$5.7m. to \$17.8m. over the same period. The average ex-post cost of capital to that company has fallen. On the other hand, the marginal cost of debenture capital has increased, as a result of rising debenture and fixed deposit interest rates. The average rate of interest on Company C debenture stock for the year ending 30th June 1965 was 5.87%, compared with 6.64% at 30th June 1970;
- (ii) All stock companies have tried to maintain a stable dividend rate in the past. This cost of capital may therefore reasonably be taken as given and when stock firms have raised ordinary capital, the marginal cost has been equated with average cost. Every 1% increase in dividend rate implies a need for an increase of 2% in profitability as a result of the taxation structure.

Ceteris paribus, for an efficient control of ~~and~~ allocation of resources by stock firms the price charged to farmer borrowers for the use of loanable funds must at least be equal to the modified cost of capital. One practical difficulty is the need for dynamic pricing, given historical cost of capital data.

A second difficulty is that the observed cost of capital (Table 12.5) will partially be a function of historical accident. Some stock firms have benefited to a greater extent than others from the use of customers' deposits. As shown the modified cost includes the rate of interest cost of holding clients current balances. Investigated firms pay from three to $3\frac{1}{2}\%$ on these daily balances and this is at parity with ruling rates on trading bank savings banks call deposits. These funds are a less expensive source of short term capital to firms than bank borrowing. Balances are basically utilised as company working capital, and supplemented by bank overdraft. Current account balances have not shown any marked trend in recent years (Table 12.6). A distribution analysis of the

Table 12.6

Stock and Station Agent Sector:
Average¹ Fixed Deposits Outstanding and Current Account
Balances Held (\$m) - Mainly Farmers

<u>Y/e 30/6</u>	<u>Fixed</u> <u>Deposits</u>	<u>Credit</u> <u>Balances</u>	<u>Y/e 30/6</u>	<u>Fixed</u> <u>Deposits</u>	<u>Credit</u> <u>Balances</u>
1957	4.7 ²	37.8 ²	1964	12.0	32.9
1958	5.2 ²	31.4 ²	1965	18.5	34.1
1959	6.8 ²	28.6 ²	1966	23.3	33.1
1960	9.7 ²	35.6 ²	1967	22.6	29.3
1961	9.6 ²	30.9 ²	1968	23.9	28.7
1962	8.4 ²	28.1 ²	1969	29.3	32.7
1963	10.8	29.9	1970	34.3	34.0

Source: Reserve Bank of New Zealand Bulletin (various).

- Notes:
- ¹ Average of quarterly balances.
 - ² June 30th balances only.
 - ³ See also Table 12.1 for trading bank comparison.

current account balances of one company indicates the extent of their volume (Table 12.7). It is likely that other firms have a similar structure. Despite the dollar volume, firms are conscious that these current account balances largely owing to farmers are on demand and are therefore at some risk. Policy has been to encourage the transfer of current balances to call balances and call balances to fixed deposit balances. The effect in recent years has been considerable, and there has been a large increase in fixed deposit volume (Table 12.6). Whilst these deposits do not entirely originate from the farm sector firms agree that a ... "considerable proportion..." was attributable to current and

Table 12.7

Distribution of the Current Account Balances of One Company
as at 30th June 1970

<u>Balance</u>	<u>% of Clients</u>	<u>% of Funds</u>
0 - \$1,000	37.5	5.5
\$1,001 - \$2,000	17.8	7.8
\$2,001 - \$5,000	25.3	25.8
\$5,001 - \$10,000	12.4	27.2
\$10,001 - \$20,000	5.8	25.3
\$20,001 -	1.2	8.4
	<u>100.0</u>	<u>100.0</u>

Source: pers. comm.

ex-farmer clients. The average rate of interest on fixed deposit finance has been increasing in recent years, and the current rates (June 1971) are between five and $7\frac{1}{2}\%$. Even so there is a differential between these rates and ruling debenture rates.

The effect of farm sector deposits has been observed to reduce stock firm's nominal cost of capital. It might be envisaged that this effect would be reflected in the allocation and pricing of loanable funds to the farm sector. However stock firms indicated that deposit balances did not directly influence pricing and allocation as:

- different
- (i) suppliers of funds were in many instances /from borrowers;
- (ii) the supply of deposit balances makes the farm sector a more attractive investment opportunity anyway than it would be otherwise;
- (iii) current account balances are on demand.

Despite their observed stability in aggregate, national stock firms are reluctant to commit these funds other than extremely cautiously⁴ and therefore their real effect in lowering average cost of capital is reduced. As a result of closer and more intimate client contact, regional companies were observed to utilise these funds in a more dynamic fashion. However considerably more empirical investigation is needed in this field before firm conclusions can be drawn.

In summary, two static cost of capital concepts have been identified. It is likely that a true historical average cost would be between the two empirical measures. These measures should

⁴ As a matter of policy, one national company treats even two year fixed deposits as "call" money.

provide the theoretical bases for the minimum average rate of interest to be charged on farm advances, for a firm merely to break even.

12.14 Direct Incidental Loan Cost

There has traditionally been little attempt in the stock and station agent sector to formally assess the costs of accepting and servicing farm loan business. One executive commented that:

"We do a lot of free service... and are interested in retaining farmers' goodwill...".

As a result, no stock firm is quantitatively aware of direct incidental loan costs. There may be an identification problem as a large proportion of these costs will be fixed but firms collectively believe that specific incidental costs bear no relationship to loan size. The impact of any apportionment would therefore be heavier on smaller loans.

An exception is in the case of budgets. Stock firms are increasingly insisting on a personal budget to accompany loan application. Traditionally this budget service has been provided free of charge. As some stock firms are hiring specialist staff specifically to prepare budgets, a charge in accordance with marginal principles would

increase the efficiency of, and justify the allocation of resources in the provision of this service (12.16).

12.14 The Risk Cost

Two risk cost elements may be considered:

- (i) the risk of loan default;
- (ii) the risk of a loan developing into a "hard core" debt.

On (i) - Default Risk: Risk of farm loan default is a function of the nature of trading, spatial location and asset backing. The national companies collectively consider that Canterbury, the Marlborough plains and the Wairarapa are the "riskiest" physical areas on climatic grounds. In addition, they all operated on the notion that increasing loan size was associated with increasing risk, regardless of business generated. On the other hand, all companies considered farm lending to have a very low inherent default risk, both absolutely and relatively. This was largely a result of physical and social sector immobility.

Risk by default may be minimised through use of the stock and chattels mortgage device. This places considerable constraint on the actions of a borrower. In addition to traditional security requirements, under the terms of the

standard stock and chattels mortgage deed of one company:

- (a) "... the grantor will during the continuance of security purchase and take of or from the grantee all farm and station stores and requisites...".
- (b) "... the grantors hereby appoint the grantee and the grantee agrees to act as the sole agent of the grantors to affect all sales...".
- (c) "... the grantee shall have full and absolute powers of determining the mode and time and place of the sale and disposition of... stock, wool, crops, produce and other chattels...".

The security documents of other investigated companies have similar provisions. The economic effects of these clauses are:

- (i) to ensure that trading business is generated from an account and therefore pre-supposing a positive account net worth. This was a more important factor than limiting loan volume;
- (ii) to reduce the uncertainty of possible business spread or transfer of a secured client;

- (iii) to transfer the security requirement from a static tool merely preserving invested funds from loss, to a dynamic tool, providing obligatory business.

The practical effectiveness of the security device in these ways is enhanced through the operation of a cartel agreement between stock firms. Any company carrying out commission business on behalf of a client whose security documents are held by a second company must transfer the proceeds of sale to that company, and in addition, at least 20% of the commission fee. This agreement has been sufficient to ensure that "tied" clients remain "tied".

Despite the practical effects of the stock firm mortgage, its use has traditionally not been widespread, particularly amongst the national companies, where an average of 15% of permanent clients were estimated to be secured as at 30th June 1970 (Table 12.2). A significantly higher proportion of the permanent clients of the regional companies were secured. Observation suggested that for these companies, the security device was a more important funds rationing device than a trading business generating device.

On (ii) - The Risk of "Hard Core" Debt: Stock firms are financing farm advances from essentially short term sources, and to maintain capital structure equilibrium aim to ensure that advances are short term. The problem of identification of the parameters

that cause the transition of a fluctuating debt into a "hard core" debt prohibits the discussion of any clear cost concept. The economic cost is only apparent ex-post when the marginal return (commission income) from an individual account is less than the marginal increase of loanable funds necessary to obtain that return. A priori, observation suggests that the risk of debt hardening is a function of:

- (a) the purpose for which funds are used;
- (b) the managerial ability of the client;
- (c) the variance in physical and climatic conditions relating to the client's business location.

Increased control over these influences might be facilitated by extensive use of funds flow accounts, formal mean estimates of anticipated future business, the use of overdraft limits, and an excess weighting factor on funds allocated on a term basis in the first instance. No stock firm at present makes formal use of these measures, though their use would help to check the drift of an account into a hard core debt, without an associated increase in business. As such, the risk element would be reduced.

12.15 Pricing Policies - Background

The costs of granting a loan have been discussed (12.12-12.14). As a further necessary prelude to marginal

discussion (12.16), information was collected on stock company pricing policies.

(i) Commission Charges:

An inter-firm commission charge cartel agreement operates in New Zealand. Commission charges range from 2% of dollar sales volume for wool handling to 5% for pigs and stud stock handling (June 1971). A mean commission charge on a typical weighted basket of trading activities would be about 4%. Standardised margins are not in operation on merchandise, wines and spirits, and other directly non-farm trading, but average gross margins on these activities are believed to be 10% of volume.

(ii) Loan Application and Incidental Financial Charges:

No stock firm currently charges for a loan application or for loan servicing costs.

Two national companies now charge fees to clients for budgets prepared in support of a loan application and for the client's use. The range of fees charged by one company is from \$20 to \$30, and in the other company from \$25 to \$50, with supplementary fees where "extra supervision" is required. Both companies state that these charges "barely cover the cost". The third national company makes no charge for budgetary services, and estimates that "only 1%" of its clients are operating on budget, a significantly lower

proportion than its competitors. Neither of the regional companies currently charges a budget preparation fee but one firm is actively planning to introduce a \$50 flat fee. All companies however:

- (a) are aware of the use of manpower in providing this service;
- (b) are faced with a demand for budgets by their clients;
- (c) indicated that they are advocating increasing use by clients of external budgeting services (e.g. prepared by private farm advisors);
- (d) are actively considering policy changes to introduce a flexible system of budget charges.

A charge is made where clients use the services of the stock firm as a banker. Charges are made in the range of 10-15 cents per book entry. This is considerably higher than comparable bank charges (Table 11.6) and charges are levied to cover an "inconvenience" factor.

(iii) Interest Rates on Loans:

The basic interest rate scale is determined by the Stock and Station Agents Association. The pricing goal is to maintain a differential over the ruling mortgage institutional rate of 1%, but at June 1971 this was only $\frac{1}{2}$ %. The standard rate at June 1971 was 8% and the

observed range of interest rates charged on farmer lending was in all cases small (Table 12.8). All companies indicated that there is an upward pressure on rates, to achieve the 1% differential goal. An interest rate constraint of 10% may be envisaged for practical purposes as lending above this rate would necessitate the registration of stock firms as finance companies.

Table 12.8

Range of Interest Rates Charged by Stock Firms
on Farm Sector Accounts
 (May-June 1971)

<u>Company</u>	<u>Standard Rate</u>	<u>Range</u>	<u>Prime Reasons for Range</u>
National A	8	7½-8	Debt term, geographical, security.
National B	8	7½-8¼	Risk, business continuity, geographical.
National C	8	NIL	Administratively convenient to maintain constant rate.
Regional D	8	NIL	Administratively convenient to maintain constant rate.
Regional E	7½	7 -8	Risk, security.

12.16 Marginal Cost Pricing - Comment

The average interest rate charged on loans (Table 12.8) was in most cases less than the average cost of capital (Table 12.5). There is also little interest rate variation. These factors therefore make interest return a secondary factor in loanable funds apportionment. The reasons for this state are that:

- (i) commission and merchandise business generation is considered by stock firms to have far more impact on the profitability of an account than interest rate variation;
- (ii) the influence of the small effectively permitted range of rates is considered to have an insignificant effect on the behaviour of farmer borrowers;
- (iii) stock firms have not traditionally used interest rate adjustment as a manipulative tool to equate variation in economic cost.

A number of factors have however been identified that will influence the real economic cost of funds commitment and ideally should be reflected in price.

(a) The Security Device

By introducing an element of near certainty into the stock firm-borrower relationship, the security device (12.14) enables business volume attributable to an account to be quantified within closely defined limits. Ceteris paribus, the economic cost of servicing and committing funds is likely to be lower to a secured client than to an unsecured client. Only two firms in practice reflect this cost in pricing, which is expressed as a $\frac{1}{2}\%$ interest rate

differential in favour of a secured account.

(b) The Loyalty Factor

The loyalty of South Island farmers to their stock firms is generally believed to be greater than their North Island counterparts (12.14). The economic cost of anticipating and retaining trading business is therefore generally lower in the South Island. One national company operates a standard $\frac{1}{2}\%$ North Island-South Island interest rate differential. Another national company has recently abolished this differential in the interest of uniformity. Ceteris paribus, its South Island clients are therefore being discriminated against.

(c) Other Risk

Only two of the investigated companies make an allowance for regional and farm type risk through the pricing mechanism. One of these considered a 1% interest rate range to be adequate for all types of risk. Other companies used the security device and to a limited extent loan volume restriction in an attempt to control risk differentials.

Apart from interest, other observed market pricing policies do not comply with marginal principles. The absence of loan

and servicing fees has been noted (12.15). Since each application is considered individually, the introduction of such charges might appear to be necessary in a cost-revenue approach. However there are practical difficulties in apportionment of what are essentially fixed costs. The irrelevance of fixed costs to marginal theory, would inevitably mean that true marginal charges would be small, and the impact limited.

On the other hand, since each farm budget is unique, the problem of cost identification is not as acute. An efficient resource allocation demands that, unless the opportunity cost of staff preparing budgets is zero, a charge for budget services is necessary. To the extent that charges are not made, or are at a flat rate (12.15), the distribution of resources will be inefficient. Alternatively, given buyer resistance to the imposition of variable charges, to the extent that stock firms are unable to divert the demand for budgeting services their resources will be misallocated.

12.17 The Opportunity Cost Approach

The approach adopted (12.11-12.16), based on loan costs and pricing has identified marginal cost variation, but has shown that average pricing techniques are generally utilised.

This analysis is incomplete since it gives no guide as to an efficient allocation of resources both to and within the farm sector. To develop such a guide, the opportunity cost or net worth approach is utilised which considers the whole stock firm-borrower relationship.

Activity diversification has been observed to be a phenomenon of stock firm behaviour (12.1). To achieve efficiency within the firm the opportunity cost of diverting resources to these activities should be equalised, given ex-post sunk costs incurred. Available data did not permit a detailed inter-sector net worth comparison on an aggregate basis and analysis is partial since it only attempts to develop a methodology for measuring the net worth of the farm sector to stock firms, rather than the net worth of all sectors. The methodology is shown to be useful in determining intra-farm sector allocation of stock firm funds (12.18).

Since loanable funds are a pre-requisite to sales stimulation (12.1) a fundamental assumption is that an increase in the volume of loanable funds lent to the farm sector by stock firms is accompanied by an increase in

commission and trading earnings. The policy aim of a firm must be to:

- (i) maximise sales from a given loanable funds commitment or;
- (ii) minimise loan commitment for a given sales volume.

The success or failure of this policy goal may be identified through account worth analysis.

In theory, the worth of an individual farm account to a stock firm will depend on:

- (i) the average yearly overdraft, weighted according to the timing of funds demand;
- (ii) the volume of commission and other business arising from that account;
- (iii) the average rate of interest charged on that account;
- (iv) the direct incidental costs of operating the account and of loan administration. For instance, cartage costs borne by the stock firm are likely to be directly correlated with farm location in relation to the store;
- (v) the timing and nature of deposit balances.

Ideally, the discounted future value of these parameters should be measured. In practice, static and comparative static analysis is only feasible, but ex-post observation is useful in determining ex-ante allocation. A formal statement of account

worth calculation is presented below (Table 12.9).

Table 12.9

Methodology of Stock Firm Account Net Worth Analysis

- (i) Weighted monthly average overdraft $\frac{\sum_{1=Jan.}^{12} \text{index} \cdot \text{overdraft}}{12}$
- (ii) Actual commission earnings on account
(e.g. wool and livestock commissions).
- (iii) Actual profit on merchandise purchased, and other earnings
(e.g. insurance commissions).
- (iv) Actual interest charged on overdraft.
- (v) Imputed interest on average monthly fixed deposit balance $\frac{\sum_{1=Jan.}^{12} \text{index} \cdot \text{balance}}{12}$
- (vi) Imputed interest on average current account balance $\frac{\sum_{1=Jan.}^{12} \text{index} \cdot \text{balance}}{12}$
- (vii) Add (ii) - (vi) = Gross earnings from account.
- (viii) Direct incidental loan and business conduct costs.
- (ix) Interest (imputed) to be earned on any account.
- (x) (viii) and (ix) = gross account charges.
- (xi) (vii) less (x) as a percentage of (i) equals net worth of an account.

Notes: Items (i), (v) and (vi): There is a marked seasonal pattern in the movement of stock firm advances and deposits (Table 12.10). The opportunity cost approach attempts to transform "actual" advances and deposits dollar values into "economic" dollar values, through the use of weighting devices.

Table 12.10

Stock Firms - Seasonal Indices

1963-70

(Balances as at Last Day of Stated Month: Monthly Figures are not Published)

<u>ADVANCES</u>	<u>March</u>	<u>June</u>	<u>September</u>	<u>December</u>
Unsecured advances	104.7	88.3	101.2	105.7
(weighting index)	"	"	"	"
Secured advances	98.6	90.5	104.5	106.4
(weighting index)	"	"	"	"

Table 12.10 (continued)

	<u>March</u>	<u>June</u>	<u>September</u>	<u>December</u>
<u>DEPOSITS</u>				
Fixed term deposits	90.7	98.1	102.0	109.1
(weighting index)	110.3	101.2	98.0	91.7
Current account deposits	107.4	111.2	84.9	96.4
(weighting index)	93.1	89.9	117.8	103.7

Source of basic data: Reserve Bank of New Zealand Bulletin (various).

The use of seasonal indices as weighting devices will tend to favour borrowing at "off peak" times (i.e. during the winter) and use of the relevant index inverse will tend to favour depositors at times of aggregate funds decrease and shortage, during the summer.

Items (ii) and (iii): As a result of the cartel agreement, commission rates are standardised (12.15). They are therefore a given variable and the worth of an account is influenced by variation in volume rather than price. Retail margins on merchandise are not fixed by the Association but mean margins do not vary extensively, and are also taken as given.

Items (v) and (vi): Imputed interest on fixed deposits may be envisaged as the differential between the current rate of interest on debentures and the current rate on fixed deposits of similar term since these two sources of finance are able to be used for similar purposes. This differential was in the range of $\frac{1}{2}$ to 1%

at June 1971.

Similarly, imputed interest on current account balances may be envisaged as the differential between the current bank rate of interest and the current rate paid on deposit balances. This differential was about two to 3%.

Item (viii): In theory such costs are able to be defined in net terms, i.e. gross direct servicing costs less service charges. Since no charges are made for these services (12.15), gross and net measures are in this context equivalent.

Item (ix): In the short term partial context this rate may be envisaged as the average rate of interest, weighted by volume, charged on all overdrafts. In the long term it will become equivalent to the average cost of capital concept i.e. long term percentage returns in aggregate less than the average cost of capital will force the firm out of business.

Item (x): The net worth concept gives an index of comparison between accounts.

Use of this measure enables a formal statement of allocation criteria to be made:

- (i) the net worth of any account must be positive;
- (ii) the gross worth (before deduction of item (ix)) of individual and aggregate farm sector accounts must in the long term cover the company's modified cost of capital (Table 12.5).

- (iii) the net worth of farm sector business must be equated with the net worth of other funds uses. For inter-sector comparison, item (ix), would have to be modified to represent a standard measure of alternative funds use; the return on long-term Government stock is a commonly accepted standard. The methodology for comparing alternative uses of funds has not been fully developed, even though these uses have been identified (e.g. Table 12.4).

12.18 Aspects of the Net Worth Concept

Some properties of the net worth measure are discussed, in the context of the effectiveness of variable manipulation. Applied use of the technique by stock firms is also discussed.

(a) Terminology

(all year j)

$$\bar{x}_1 = \sum_{i=1}^{12} \frac{\bar{x}_i \cdot w_i}{12}$$

1 = Jan.

\bar{x}_1 = weighted monthly average overdraft balance.

\bar{x}_i = actual balance outstanding, month i.

w_i = weighting index.

Commission earnings, $r_1 z_1 / 100$

r_1 = average rate of commission earnings (%)

z_1 = volume of commission business.

Trading earnings, $r_2 z_2 / 100$

r_2 = average rate of trading profit (%)

z_2 = volume of trading business.

Implicit deposit earnings, $i_2 \bar{x}_3 / 100$

i_2 = interest differential, as previously defined.

\bar{x}_3 = weighted monthly average, current and deposit account balance.

Interest earnings, $i_1 \bar{x}_2 / 100$

i_1 = average rate of interest charged.

\bar{x}_2 = average monthly balance outstanding.

Direct account charges, c .

Alternative rate of return, $i_3 \bar{x}_2 / 100$

i_3 = alternative rate of interest available.

The net worth of an account is therefore given by

$$y = \frac{r_1 z_1 + r_2 z_2 + i_1 \bar{x}_2 + i_2 \bar{x}_3 - (100c + i_3 \bar{x}_2)}{\bar{x}_1}$$

It has been stated (12.17) that a policy aim of stock firms is to maximise sales from a given funds commitment. This might be interpreted as maximising y , with respect to \bar{x}_1 , and the conditions would be,

$$f'(\bar{x}_1), r_1 z_1 + r_2 z_2 + i_1 \bar{x}_2 + i_2 \bar{x}_3 = 100c + i_3 \bar{x}_2$$

$$\text{and } f''(\bar{x}_1), r_1 z_1 + r_2 z_2 + i_1 \bar{x}_2 + i_2 \bar{x}_3 < 100c + i_3 \bar{x}_2$$

which are inconsistent with maximising conditions.

The function is asymptotic to both origins and therefore net worth maximisation is not possible if all variables are independent.

It can be stated that:

- (i) as $\bar{x}_1 \rightarrow \infty$, $y \rightarrow 0$,
and (ii) as $\bar{x}_1 \rightarrow 0$, $y \rightarrow \infty$.

(b) Net Worth Adjustment

The net worth of an account may be adjusted by

- (i) manipulating the volume of average debt outstanding and its timing;
- (ii) manipulating business generated;
- (iii) manipulating interest rate charged;
- (iv) manipulating deposit volume and its timing.

From a priori evidence, $r_1 = 4\%$. $r_2 = 10\%$ (12.15), $i_2^{\frac{n}{2}}$ 2% (12.17), and $i_3^{\frac{n}{3}}$ 10% (say, average cost of capital, from Table 12.5). Therefore for any account,

$$y = \frac{4z_1 + 10z_2 + i_1\bar{x}_2 + 2\bar{x}_3 - (100c + 10\bar{x}_2)}{\bar{x}_1}$$

On (ii):- Changes in Business Volume

$$\text{Let } y = \frac{4z_1 + a_1}{\bar{x}_1}$$

Where a_1 = constant non-commission return less costs,
and $y > 0$.

Then, to maintain a constant y , an increase in loanable funds committed to an account, $\Delta \bar{x}_1$ ($p_1 \bar{x}_1$), must be compensated by an increase in commission business, Δz_1 ($p_2 z_1$), in the ratio

$$\frac{z_1 + 25a_1}{\bar{x}_1} = \frac{\Delta z_1}{\Delta \bar{x}_1} = \frac{p_2 z_1}{p_1 \bar{x}_1}$$

so that
$$\frac{z_1 + 25a_1}{z_1} = \frac{p_2}{p_1}$$

and as $z_1 \rightarrow \infty$ $p_2/p_1 \rightarrow 1$.

Similarly, it can be shown that to maintain y constant Δz_2 from $\Delta \bar{x}_1$ requires

$$\frac{z_2 + 10a_2}{z_2} = \left(\frac{p_2}{p_1} \right) (z_2)$$

and, to maintain y constant, by increasing $\Delta \bar{x}_3$ from $\Delta \bar{x}_1$ requires

$$\frac{\bar{x}_3 + 50a_3}{\bar{x}_3} = \left(\frac{p_2}{p_1} \right) (\bar{x}_3)$$

Where a_2 , a_3 represents other earnings. For example, given at the outset that,

$z_1 = 1000$	$a_1 = 100$	$\bar{x}_1 = 1000$	$y = 14.1$
$z_2 = 1000$	$a_2 = 40$	$\bar{x}_1 = 1000$	$y = 14.1$
$\bar{x}_3 = 1000$	$a_3 = 120$	$\bar{x}_1 = 1000$	$y = 14.1$

Table 12.11

Rates of Change in z_1, z_2, \bar{x}_3 Resulting From Change in
 \bar{x}_1 , to maintain constant y
 (as a Percentage)

y	$\Delta \bar{x}_1$ (%)	Δz_1	Δz_2	$\Delta \bar{x}_3$
14.1	5	17.5	7.0	35.0
14.1	10	35.0	14.0	70.0
14.1	15	52.5	21.0	105.0
14.1	20	70.0	28.0	140.0
(p_2/p_1)		3.5	1.4	7.0

The implications of this discussion are that:

- (i) at the margin, increases in trading business rather than commission business or deposit business will have a greater effect on y . This is as a result of differences in average rates of return;
- (ii) given a constant a , the percentage increase in business volume required is greater than any Δx . As z_1, z_2 or $\bar{x}_3 \rightarrow \infty$, then the ratio $\rightarrow 1$.

On (iii) Interest Rate Adjustment - A change in interest rate, Δi_1 , on loan outstanding, has the effect of influencing net worth, y , by

$$\frac{y + \Delta y}{y} = \frac{(i_1 + \Delta i_1) \bar{x}_2 + a_1}{i_1 \bar{x}_2 + a_1} \quad (a_1 = \text{other earnings})$$

$$\text{and, } \frac{\Delta y}{y} = \frac{\Delta i_1 \cdot \bar{x}_2}{i_1 \bar{x}_2 + a_1}$$

The rate of change in net worth, given an increase in autonomous business volume is represented by

$$\frac{\Delta y}{y} = \frac{4 \Delta z_1}{4 z_1 + a_2} \quad (a_2 = \text{other earnings})$$

and where an increase in funds commitment, Δx_1 , is necessary to stimulate business volume, then

$$\frac{\Delta y}{y} = \frac{4 \Delta z_1 \bar{x}_1 - (4 z_1 + a_2) \Delta \bar{x}_1}{(4 z_1 + a_2) (x_1 + \Delta x_1)}$$

From these formulae, *ceteris paribus*, an increase in business volume generated, will have a greater effect on the net worth of an account, than an equivalent percentage increase in interest rate.

The effect of an increase in net worth, as a result of adjustment in interest rates can be illustrated (Table 12.12)

where:

368.

		Gross Return	\bar{x}_2	\bar{x}_1	
CASE I		$100 + i_1.900$	900	1000	On-peak borrowing
CASE II		$100 + i_1.1000$	1000	900	Off-peak borrowing
CASE III		$100 + i_1.1000$	1000	1000	"Normal"

Table 12.12

Effect of Interest Rate Adjustments (as a %)

<u>CASE I</u>				<u>CASE II</u>		<u>CASE III</u>	
i	Δi	y	Δy	y	Δy	y	Δy
1	+50	10.9	+8.3	12.2	+9.0	11	+9.0
2	+33	11.8	+7.6	13.3	+8.3	12	+8.3
3	+25	12.7	+7.1	14.4	+8.3	13	+7.7
4	+20	13.6	+6.7	15.6	+7.0	14	+7.1
5	+100	14.5	+6.2*	16.7	+6.6*	15	+6.6*
10	+100	19.0	+4.7*	22.2	+5.0*	20	+5.0*
20		28.0		33.3		30	

* Average per unit.

On (iv) - Debt Timing Adjustment: It is given that

$$\bar{x}_1 = \sum_{i=1}^{12} \frac{w_i x_i}{12}$$

Maximum $\bar{x}_1 = \frac{x_i \cdot w_k}{12}$,
at peak times.

where all borrowing is carried out
(w_k = maximum weighting factor).

Minimum $\bar{x}_1 = \frac{x_i \cdot w_l}{12}$,
at off peak times.

where all borrowing is carried out
(w_l = minimum weighting factor).

Ceteris paribus, the effect on net worth of switching all borrowing from peak to off-peak periods will be:

$$\frac{\Delta y}{y} = \frac{w_k - w_1}{w_1}$$

For example, let $\bar{x}_2 = 1000$, A (net returns) = 100. Then the effect of a change in borrowing is shown by Table 12.13.

Table 12.13

Examples of the Effect on Net Worth of a Change
in Borrowing Patterns

<u>Weighting indices</u>		\bar{x}_2	y (%)	Δy (%)
w_1	w_k			
90	110	1000	11.1 - 9.1	+21.9
80	120	1000	12.5 - 8.3	+50.6

If there is an effect on net returns, ΔA by the manipulation of advance timing (i.e. the borrower conducts less trading business), then the maximum effect on net worth adjustment will be given where:

$$\frac{\Delta y}{y} = \frac{w_k - w_1}{w_1} - \frac{\Delta A \cdot w_k}{A \cdot w_1}$$

i.e. if $\frac{\Delta A}{A} > \frac{1 - w_1}{w_k}$ then there is a decrease in net worth as a

result of manipulating borrowing.

(c) Summary

Some of the properties of the net worth concept have been examined. This has been cursory,

but does indicate the wide possibilities of use of this measure. In particular, observations are that:

- (i) maximisation of y is not possible, in the case where all variables are assumed to be independent;
- (ii) *ceteris paribus*, the effect of marginal changes in business conducted on the net worth of an account is greater than other changes;
- (iii) in practice, the effect of debt timing adjustment is likely to be marginal particularly in view of:
 - (a) the relatively small observed seasonal variance in aggregate lending (Table 12.10);
 - (b) the possible effects on business generated, as above.
- (d) Applied Use of the Technique by Stock Firms

Lack of real data has prevented applied consideration of the net worth technique. It is utilised by two national stock firms in a crude fashion. These companies measure interest, commission and trading earnings only from an account. Both have developed the criteria:

- (i) basic acceptable rate of gross earnings to funds committed, 15%. This is considered to be a "reasonable" rate of return;
- (ii) accept all business with a gross earnings rate in excess of 15%. If earnings are less, attempt to stimulate the rate through increased business volume, manipulating the interest rate, or reducing average overdraft.

This policy does not ensure that loanable funds are allocated efficiently, given the opportunity cost approach, as:

- (i) the use of the 15% measure is arbitrary and bears no direct relationship to any observed cost of capital measure, or alternative funds use;
- (ii) no allowances are made for the timing of advances and each month is weighted equally. This is despite an observed cost variation resulting for instance from variation in annual utilisation of bank credit by firms;
- (iii) direct incidental loan and business costs are not taken into account, though there may be an identification problem (12.14);

- (iv) deposit balances are not taken into account. Accounts carrying no deposit balances are formally given equal weight to those with balances
- (v) interest rate variation is limited (Table 12.8), and "actual interest" is likely to be similar to "imputed interest" (Table 12.9). A differential should allow for factors such as risk assessment;
- (vi) extraneous factors, such as ex-post tradition, distort the interpretation of information generated in this way. This has a biasing effect on ex-ante funds allocation.

The actual account evaluation procedures described above were not currently utilised by three of the investigated companies, where business appeared to be conducted in a more informal fashion. One regional executive commented that:

"... The amount of a loan is not related to the amount of business... a person requires so much money, and offering half won't help..."

For these two regional companies security availability was a far more significant rationing device than business generation, (e.g. Table 12.2).

In conclusion, a methodology has been developed to measure the relationship between loanable funds committed and returns generated in an attempt to determine the net worth of farm sector accounts to the stock firms. Whilst this approach is static and partial in concept, it is consistent with an opportunity cost approach to resource allocation. Stock firms do not utilise this approach in resource allocation, and their methods above have been shown to be likely to induce inefficiency.

12.18 The efficiency of the System - Summary and Conclusions

The market structure is more complex than the trading bank market for loanable funds (Chapter 11). Business is an additional variable and the supply of loanable funds is only a secondary aspect of the stock firm - client relationship. As such, business has been observed in theory to assume an allocative role. The market is summarised from conduct and allocative aspects.

(a) Conduct Aspects

Two observable market factors comply with stated efficiency conditions (10.3);

- (i) despite formal advertising, services provided by all stock firms are similar (12.3). A major exception is the additional informality, personal service and direct contact that regional companies are better equipped to offer their clients;
- (ii) market entry is unrestricted to clients who are prepared to trade (12.5).

Other market conduct aspects are inconsistent with the theoretical ideal:

- (i) market concentration is high (12.2) facilitating easy operation of cartel pricing (e.g. 12.15);
- (ii) positive loyalty is a feature (12.4).

In addition, use of the security device enforces loyalty and restricts free market exit (12.14);

- (iii) borrowers are unaware of alternative availability and cost of credit (12.8);
- (iv) information utilised by stock firms is generally restricted to that generated within the sector (12.6);

- (v) there is a dichotomy of goals between branch and Head Office level (12.7), and the profit maximisation goal alone cannot be accepted.

The major effect of these imperfections is to facilitate a favourable climate for the "locking-in" of loanable funds to the farm sector, that could possibly be utilised in more efficient ways.

(b) Allocative Aspects

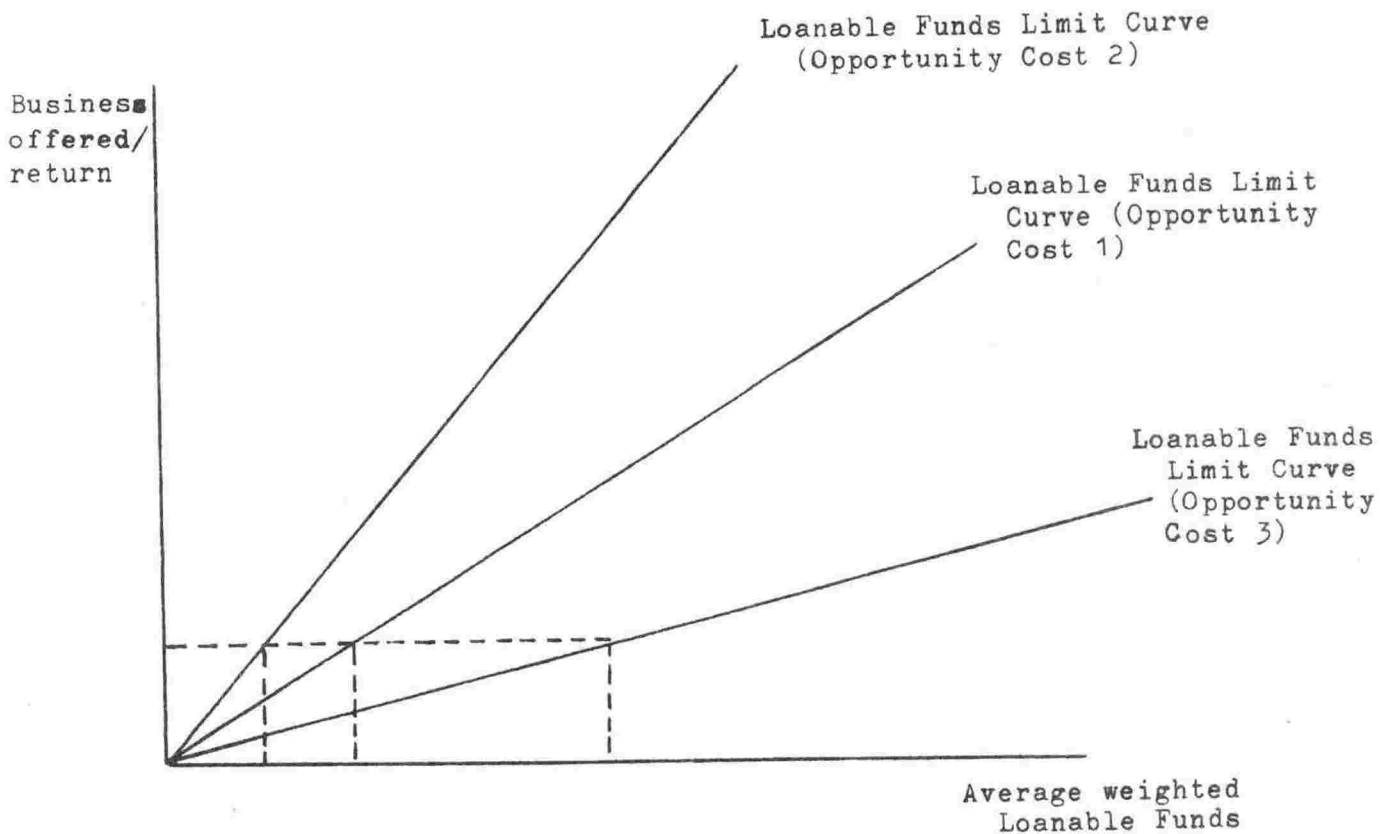
The entire investigation has been partial, in that methods for determining efficient funds allocation for non-farm lending purposes have not been discussed. Other authors have considered problems of allocation for other uses.⁵

In theory the loanable funds allocation procedure developed provides an effective funds rationing device by relating the overall net worth of any farm account to the loanable funds committed to achieving returns. On the assumption of funds flow fluidity and given a static opportunity cost of funds allocation to a company a "loanable funds limit" curve can be drawn

⁵ See for instance a method to determine optimum stock levels developed by McLelland, quoted in Speight, H., Economics and Industrial Efficiency. 2nd ed. London: Macmillan and Co. Ltd., 1967, pps. 137-9.

(Fig. 12.1) relating the average weighted loanable funds volume allocated to an account to the estimated returns from that account. A profitable new enterprise exploited by a firm will change the whole opportunity cost relationship, demand a re-allocation of resources and adjust the loanable funds limit curve to curve two, i.e. to maintain opportunity cost parity, new circumstances demand that an increasing business volume is necessary to support a constant funds commitment. Similarly, a decrease in the profitability of other stock firm funds uses (opportunity cost curve three) will allow an increased allocation of funds to the farm sector for a similar business volume.

Fig 12.1 Relationship Between Anticipated Business Volume and Loanable Funds Committed



This allocation procedure is crude as it ignores ex-post and ex-ante differences in opportunity cost identification i.e. a funds limit imposed to retain ex-post equilibrium will influence the ex-ante opportunity cost structure as funds are injected into, or withdrawn from farm lending. It does illustrate the use of the farm sector net worth concept in resource allocation, given alternative funds uses.

It has been shown (12.17(d)), that anticipated business is at least a nominal funds rationing device. Three factors may be envisaged as restricting an efficient allocation of stock firm loanable funds. These are:

- (i) the use of security as an allocative device;
- (ii) the use of current deposit balances as an allocative device;
- (iii) the role of tradition.

On (i) - Security: Apart from the regional firms, security requirements were not observed to be a major allocative device (12.14) and first-class security was not taken as given, as in the trading bank market (11.5).

On (ii) - Current Deposit Balances: Farm deposit balances were a relevant factor in determining theoretical loanable funds allocation (Table 12.9) since they were observed to be an important influence on average effective cost of capital (Table 12.5). In practice stock firms do not consider deposit balances as part of their

allocative process. The hypothesis is that firms consider long term business generation to be of far greater relevance than short term cost of capital advantages, as deposits are more likely to be held by older farmers with limited future business prospects. This hypothesis is consistent with a dynamic resource allocation procedure, but it was not examined in depth in interview.

On (iii) - Tradition: In theory ex-post tradition and behaviour should play a limited role in ex-ante funds allocation. In the practical context the effect of tradition is likely to have a distorting effect. One executive, whose company utilised the "15% gross earnings rule", (12.17(d)) indicated that earnings on a number of old established accounts were "well below" this limit, but that traditional association tended to "trap" funds allocated ex-post to these clients. However as the client structure changes and new clients enter the market, the effect of past tradition, given that stock firms are increasingly "efficiency" conscious, is likely to decline.

In summary, the partial and qualitative conclusion is that there is an inefficient allocation of funds to the farm sector by stock firms as:

- (i) there are conduct deficiencies in the market (see above);
- (ii) the theoretical opportunity cost "net worth" procedure developed is at variance with practical methods utilised by stock firms to evaluate the individual worth of accounts and resultant funds allocation.

- (iii) marginal loan pricing is not utilised by stock firms despite observed cost differentials (12.16), and pricing bears no direct relationship with individual companies' cost of capital (Table 12.5).

CHAPTER THIRTEEN: Sources of Farm FinanceThe State Advances Corporation

It has been shown (Chapter Four), that the State Advances Corporation plays a prominent role in the long term farm credit market, and this is now considered.

A MARKET CONDUCT3.1 The Corporation

The early origins, structure and performance of the Corporation have been fully described by Keen.⁽¹⁸⁸⁾ The Corporation was established under the State Advances Corporation Act, 1936, following the repeal of the Mortgage Corporation Act of 1934-5, that founded an original lending institution. Subsequent amendments to the 1936 Act were consolidated into the 1965 State Advances Corporation Act. This Act re-affirmed the Corporation's status as a corporate body, with a liability for rates and taxes (s.43). A profit making objective is not stated specifically in this Act but the Act implies that the Corporation will make a profit in the course of its business to be paid in normal circumstances into the Public Account (s.37). The functions of the Corporation are defined under section 15, sub-sections one and two, of the 1965 Act. These clauses state that:

- 15(1) "... The principal business of the Corporation shall be the making of loans for any purpose approved for the time being in writing by the Minister of Finance for the purposes of this sub-section...".
- 15(2) "... The Corporation may also make loans for any purpose authorised by any other provision of this Act, or of any other enactment and shall carry out such functions as are conferred on it by any other provision of this Act or of any other enactment...".

The extent of Government control over the Corporations' affairs is further amplified in s(17) of the 1965 Act which requires that the Corporation

"... implements the policy of the Government...".

The effect of sections 15 and 17 have therefore been to effectively negate any real benefits of corporate status, and to determine the Corporation's practical role as that of a Government department.

The 1936 and 1965 Acts do not detail the precise purposes for which loans may be made. Two exceptions are that under s(19) of the 1965 Act, the Corporation is empowered to lend to developing industries, and under s(18) to local authorities for housing purposes. The distribution of loan authorisations in recent years (Table 13.1) shows that:

- (i) industrial lending is only a small proportion of total lending;

- (ii) the proportion of funds in toto committed to the farm sector is increasing.

Table 13.1

Structure of Corporation's Lending Activities
(% of annual authorisations)

<u>Y/e</u> <u>31st March</u>	<u>Rural (%)</u>	<u>Urban (%)</u>	<u>Indus- trial</u> <u>(%)</u>	<u>Total</u> <u>auths. (\$m)</u>	<u>Total rural inv.</u> <u>outstanding/</u> <u>urban investment</u> <u>outstanding (%)</u>
1964	32.6	61.0	6.4	86.8	34.0
1965	39.1	54.1	6.8	109.5	38.0
1966	40.3	58.0	1.7	99.5	40.3
1967	42.2	52.4	5.4	105.0	44.0
1968	31.5	67.7	0.8	75.3	47.5
1969	29.5	69.2	1.3	92.7	46.5
1970	39.8	55.5	4.7	120.3	48.2
1971	39.0	58.3	2.7	136.8	51.1

The differences in specialist knowledge required has meant that the "urban" and "rural" aspects of the Corporation's lending functions have traditionally been run separately. In 1970 this dual organisation was formally identified, and the Corporation is now administered as two separate entities, each sharing common managerial, legal and secretarial facilities.

The relative role of the Corporation in the overall market for rural term finance has fluctuated from year to year in accordance with the general level of economic activity and confidence in the industry (Table 13.2). This fluctuation is highlighted by examination of the co-efficient of variation statistic calculated for each mortgage source. Whilst this data does not indicate such a trend, the Agricultural Production Council⁽¹⁶⁸⁾

has concluded in April 1971 that the role of the Corporation in the new rural mortgage market has increased and is likely to increase further. This is at the expense of the proportional market shares now held by insurance companies and private individuals.

It must be noted that most listed finance sources (Table 13.2) are primarily lending purchase finance. This is a secondary lending function of the Corporation (Table 13.3). The Corporation represents virtually the sole source of non-purchase term finance to the New Zealand farm sector and therefore its true market significance is not fully reflected by this data.

Table 13.2

New Rural Mortgages Classified
According to Source
(% Mortgages Registered)

<u>y/e 31st</u> <u>March</u>	<u>S.A.C.</u>	<u>Insurance</u> <u>Cos.</u>	<u>Other</u> <u>Insts.</u>	<u>Private</u> <u>Indivs.</u>	<u>All</u> <u>Other</u>	<u>Rural</u> <u>Morts.</u> <u>Reg.</u> <u>(\$m)</u>
1964	25	12	8	40	15	117.4
1965	26	12	9	39	14	162.8
1966	22	11	10	45	12	180.0
1967	24	11	9	44	12	185.6
1968	16	13	11	47	13	152.4
1969	18	13	11	43	15	148.0
1970	25	12	8	39	16	185.6
1971	30*	8	9	36	17	214.6
Mean	22.3	11.5	10.4	41.6	14.2	
Standard deviation	3.5	2.6	2.9	3.7	1.8	
Coefficient of varia- tion	0.16	0.14	0.28	0.09	0.13	

* Includes suspensory loans.

Source of data: (168) p. 62.

13.2 Goal Structure

The goals of the Corporation's rural lending have been stated¹

"... The Corporation's fundamental economic objectives are to assist efficient resource allocation within agriculture in order to attempt to maximise farm income, and to enable necessary re-allocation and re-adjustment of such resources to occur smoothly. On the other hand, interwoven with such an objective is the important social role of the Corporation. The aim is to carry out economic policies with a minimum of disruption to the individual. In many cases, such an objective is likely to over-rule what appears to be economic necessity..."

It would be ideal to examine the Corporation's activities on both economic and welfare criteria. Whilst economic efficiency can be observed on the basis of objective criteria, the Corporation's welfare goal is a more subjective nebulous concept. The Corporation's lending role is therefore largely examined on the basis of economic criteria.

However, from the statement above it can be noted that profit maximisation is not the major goal of the Corporation.

¹ **State** Advances Corporation, Background Paper II, submitted to the Committee of Inquiry into Lending to Farmers, September 1971, p. 1.

13.3 The Role of Advertising

The Corporation does not formally advertise for prospective borrowers. The reasons for this situation are that:

- (i) the Corporation is a well-known institution;
- (ii) the Corporation is a near monopoly source of long-term project type finance;
- (iii) approaches to the Corporation are frequently made through accountants and solicitors, whose professions demand that they be aware of the Corporation's lending terms and policies;
- (iv) other lending institutions have developed policies of referring prospective borrowers to the Corporation.

Ex-post Corporation policy to achieve goals has varied, and the Corporation's field staff are generally not fully aware of the formal goal structure. For instance in the early 1960's, the prime policy aim was the provision of farm purchase finance. In the mid 1960's emphasis was placed on finance for development purposes and current policy aims are largely structural in nature. Table 3.3 below gives quantitative expression to these changes in policy emphasis.

If not effectively communicated these rapid policy changes may:

- (i) induce distortions in the information chain to potential borrowers;
- (ii) discourage potential borrowers who may possess distorted or confused information.

As a result, the Corporation may be unaware of the "true" demand for all aspects of farm finance. In addition, no record is kept of initial enquiries that are made "over the counter", and not proceeded with on "policy" grounds. In these cases there may be delays in the Corporation's aggregate appreciation of the demands for finance not within the ambits of current policy, but consistent with goals.

The investigation suggests that to satisfy efficiency criteria (10.3) there is a need for informative advertising to help identify the true demand for funds. Such advertising should stress the Corporation's versatility as the concept of rigid policy goals itself is likely to lead to a distortion in the true finance demand pattern.

13.4 Attitude of the Farmer to the Corporation

Borrowers were observed to exhibit positive loyalty towards the Corporation. The Credit Survey showed that:

- (i) low interest rates and favourable terms were the major attributes of the Corporation in the eyes of existing mortgage holders;

- (ii) farmers had few criticisms in their dealings with the Corporation;
- (iii) a high proportion of current mortgage holders indicated that they would re-approach the Corporation for additional finance in the first instance;
- (iv) there was a high observed awareness factor amongst farmers contemplating future borrowing;
- (v) the rate of interest was the major^{factor}/attracting future borrowers to the Corporation.

The overall conclusion was that the Corporation is received favourably by the farming community at large. Its favourable lending terms are believed to have attracted more borrowers than if loans were made on a more competitive market basis.

13.5 Freedom of Market Entry

The fulfilment of preconditions is necessary for entry to the Corporation's lending market. An example of these set of preconditions is that farm purchase loans are restricted to farmers who are

"... experienced and currently engaged in the industry, usually between 25 and 35 years of age and who are competent and creditworthy with a reasonable cash contribution to make..."

Security requirements and loan limits will also restrict entry to the Corporation's rural lending market. Stock loans are currently made on the basis of 60% of the fair sale value of stock and plant. Purchase loans have an upper margin of 66 $\frac{2}{3}$ % of the fair sale value of land, stock and plant, with upper limits of \$25,000 for dairy farms, \$40,000 for sheep farms, and \$50,000 for back country runs. These restrictions frequently mean that Corporation finance must be supplemented by personal resources, and in most cases by additional loan finance. If these are not available, entry is restricted.

In essence therefore, market entry is restricted to farmers already operating within the sector, or to farmers who have had extensive experience in the sector and have accumulated a cash reserve. Regardless of personal ability, market entry is precluded to:

- (i) "farmers" with no experience who are contemplating entry to the sector in the first instance;
- (ii) prospective borrowers who have had experience in the sector but who have not been able to accumulate any cash reserve.

Particularly with purchase finance, funds allocations are made on historical factors (e.g. past cash accumulation ability - or luck, and experience), rather than on ex-ante future income potential considerations. The entry requirements in the dynamic context are likely to inhibit optimum attainment of goals.

13.6 Information Utilisation (General)

(a) Staff:

The Corporation's rural field staff have a critical market role since it is on their recommendations that loanable funds are allocated. They are directly responsible for efficient or inefficient resource allocation in the micro context. It is Corporation policy to recruit field staff from Lincoln College, who have completed the qualification of Diploma in Valuation and Farm Management. No subsequent formal training is given, and "on the job" training and internal promotion is the norm. This policy has meant that:

- (i) staff have a training bias in favour of on-farm management rather than in the broader aspects of efficient resource allocation;

- (ii) staff training through the uniform diploma course has allowed a limited inflow of new ideas and some inflexibility of thinking has been observed.

There is an awareness of possible training deficiencies and a need has been felt to give internal training to field staff to supplement academic qualifications.

(b) Background:

The close relationship of the Corporation with Government has meant that it is susceptible to the actions of pressure groups and other Government Departments. In the context of policy formation the Corporation receives a substantial injection of external information. Despite the volume of internal information available, this is not actively utilised for ex-ante policy purposes. This behaviour is in direct contrast to the practices of stock firms and trading banks, who were observed to utilise predominantly internally generated information (11.5, 12.6).

13.7 Information Utilisation (Specific)

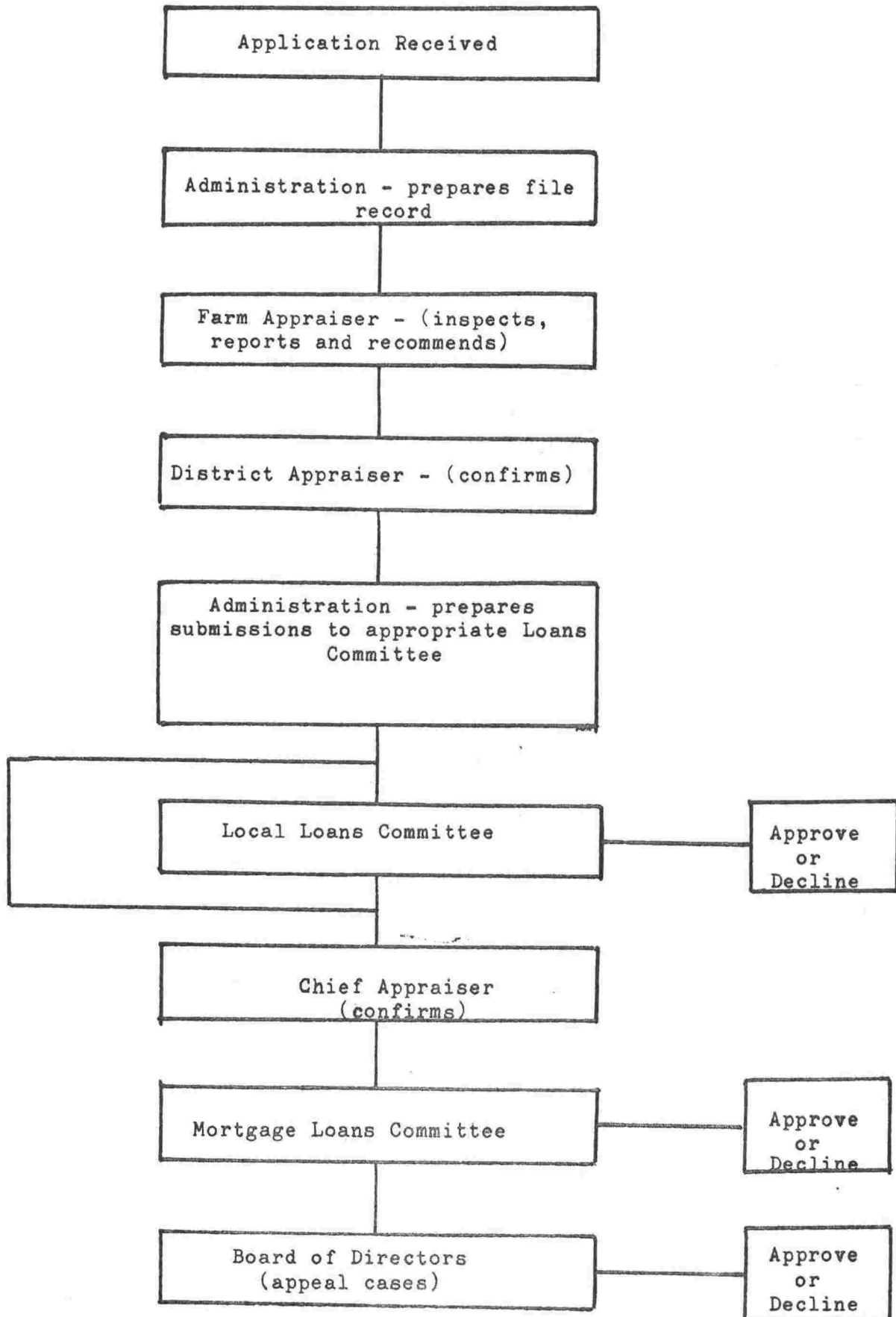
A flow chart indicating the stages of farm loan processing is drawn (Fig. 13.1). The effect of the lengthy processing procedure is to:

- (i) give excess weight, in terms of time cost, to an unacceptable loan. The formal procedure makes no allowance for any screening device;
- (ii) increase the average time taken to process all loan applications.

There is therefore some waste of manpower in the mechanics of loan processing.

The application process requires a number of documents to be completed, and the paperwork involved in any application is voluminous. Emphasis is placed on the cash budget in assessing the worth of a loan but the full benefit of this tool as a dynamic rationing device is precluded as:

- (i) the budget form contains considerable detail on what is considered to be largely irrelevant information from the viewpoint of loan assessment;

Fig. 13.1Flow Chart of Farm Loan Processing

- (ii) the budget is prepared by the farm appraiser (field officer) in consultation with the applicant. This may lead to gross data bias, in that excess subjective content may be introduced into loan assessment;
- (iii) the level of sophistication of budget preparation is not high. For example, no attempt is made to relate ex-ante prepared budgets with ex-post performance as reflected by farm records. In addition, prepared budgets are static rather than parametric in concept and no formal allowance is made for factors such as price variation.

The Corporation is aware of these problems and attempts are being made to overhaul the whole information gathering process in an attempt to:

- (i) reduce paperwork;
- (ii) identify critical parameters (such as lambing percentage or butterfat production) that will help to determine the probability of a given loan being within guidelines set by Corporation goals;
- (iii) improve the standard of technical budgeting expertise and minimise the subjective budgeting component.

With these changes the Corporation believes that it has sufficient information to objectively assess applications for finance to satisfy its stated goals.

13.8 Market Separation

Two aspects of market separation are discussed. These are inter-sector separation as illustrated in Table 13.1 and intra-sector separation.

(a) Inter-Sector Separation

The Corporation has no fixed criteria upon which to base its inter-sector allocation of funds as this is basically pre-determined by Government. A major policy aim is to re-invest principal repayments in the sector from which they are generated. This means that funds allocated ex-post to a sector are in effect "locked" into that sector.

The effect of this policy is to preclude any rapid adjustment in resource allocation between sectors and this can be simply illustrated algebraically.

Let A, B represent the two sectors to which the Corporation allocates loanable funds, and

$\frac{i_A}{\bar{A}} = \frac{i_B}{\bar{B}}$ is an efficient long term equilibrium, where i_A , i_B represent returns and \bar{A} , \bar{B} , the stock of funds committed to each sector at time t to give equality at the margin.

Let $P_A \cdot \bar{A}$, and $P_B \cdot \bar{B}$ represent the portion of principal repaid from the two sectors in year $(t + 1)$, and X new funds available from Government for lending:

Then, funds available for allocation, year $(t + 1)$, are given by

$$Y_{t+1} = (P_A \cdot \bar{A} + P_B \cdot \bar{B} + X).$$

To retain efficient equilibrium, funds are allocated to sectors in the proportion \bar{A}/\bar{B} .

$$\text{Then } \bar{A}'_{t+1} = \frac{A(A + B + X) - AB(P_A - P_B)}{A + B}$$

$$\text{and } \bar{B}'_{t+1} = \frac{B(A + B + X) - AB(P_B - P_A)}{A + B}$$

where \bar{A}'_{t+1} , \bar{B}'_{t+1} represent theoretical balances outstanding at the end of year $(t + 1)$.

$$\begin{aligned} &\text{But, as a result of the "locking in" policy, } \bar{A}''_{t+1} \\ &= \frac{A(A + B + X)}{A + B} \end{aligned}$$

$$\text{and } \bar{B}''_{t+1} = \frac{B(A + B + X)}{A + B}$$

where \bar{A}''_{t+1} , \bar{B}''_{t+1} represent actual balances outstanding at end of year $(t + 1)$;

$$\text{and } \bar{A}^1_{t+1} \neq \bar{A}''_{t+1} \text{ and } \bar{B}^1_{t+1} \neq \bar{B}''_{t+1}$$

So there has been an inefficient allocation of resources.

Example

$$\text{Let } \bar{A}_t = 100, P_A = .05, P_A \bar{A}_{t+1} = 5, X = 50$$

$$\bar{B}_t = 200, P_B = .10, P_B \bar{B}_{t+1} = 20$$

Then theoretically,

$$A'_{t+1} = 120$$

$$B'_{t+1} = 230$$

but as a result of the "locking in" policy

$$A''_{t+1} = 116\frac{2}{3}$$

$$B''_{t+1} = 233\frac{1}{3}$$

The effects of the "locking in" policy on efficient intra-sector resource allocation can be summarised:

(i) where there is an efficient allocation of resources at time t , then this will become inefficient at time $(t + 1)$, as above, given a constant long term opportunity cost ratio;

(ii) where there is an inefficient allocation of resources at time t the locking-in effect will lengthen the progress path towards optimum resource allocation, given a constant long term opportunity cost ratio.

An alternative efficiency equilibrium can be stated, in the static context as

$$j_A = j_B$$

where j_A , j_B represent effective yield (as per 10.9), for a given sum invested.

Since the Corporation's rural and urban lending both include a welfare payback, then an efficient allocation can be expressed as:

$$\frac{i_A}{1 + r_A} + w_A = \frac{i_B}{1 + r_B} + w_B$$

$$\text{Therefore } \frac{i_A (1 + r_B) - i_B (1 + r_A)}{(1 + r_A) (1 + r_B)} = w_B - w_A - (1)$$

which gives the relationship between welfare components, w_B , w_A , given the nominal yield, i_A , i_B , and mean risk of lending, r_A , r_B a given sum, \bar{A} , and \bar{B} , to sectors A and B at the margin.

In a simple case, the efficient welfare differential is determined by the relationships between nominal returns and risk factors. The actual welfare components (not discussed) would need to be determined by cost-benefit analysis e.g. the social payback of providing owner-occupied homes.

For example, let

$$\begin{array}{ll} r_A = .03 & i_A = .05 \\ r_B = .07 & i_B = .04 \end{array}$$

(Where r_A , r_B , i_A , i_B represent hypothetical average data lending to sector A - agriculture, sector B - urban).

Therefore an efficient welfare yield differential is given from (1),

$$w_B - w_A = .0112$$

That is, for an efficient allocation of resources given above assumptions, the welfare yield from lending for urban purposes (w_B), should exceed the welfare yield from lending for rural purposes (w_A) by 1.1%.

This margin will increase as a result of:

- (i) an increase in the mean risk of lending for urban rather than rural purposes, given dollar volume;
- (ii) an increase in the nominal yield of rural as opposed to urban lending.

The concept of inter-sector allocation is not pursued further, since it would require a detailed cost-benefit analysis to determine welfare components.

(b) Intra-Sector Separation

The proportion of funds allocated for stated purposes in the rural sector has shown considerable fluctuation in recent years (Table 3.3). In particular the changes in the proportion of funds allocated for farm purchase and for additional land can be noted. Figures in parentheses are calculated by dividing the percentage volume distribution, by the percentage number distribution. The ratio gives an indication of relative loan size. It shows that the drain of funds for farm purchase and restructuring purposes is heavy and increasing, compared with other uses. The observed heavy claim on funds for purchase and restructuring must be interpreted in the context of the Corporation's goals.

Table 13.3

Distribution of Rural Authorisations
According to Stated Purpose (%)

<u>Y/e 31st</u> <u>March</u>	<u>Total</u> <u>Rural</u> <u>Auths. (\$m)</u>	<u>Stock</u> ¹ <u>Purchase</u>	<u>Farm</u> <u>Purchase</u>	<u>Develop</u> ² <u>ment</u>	<u>Refin</u> <u>ance</u>	<u>Restruct</u> <u>uring</u>
1964	29.2	3.2(0.4)	63.7(1.5)	11.9(0.6)	10.1(0.7)	11.9(0.8)
1965	41.7	3.2(0.3)	65.4(1.5)	12.6(0.7)	5.9(0.6)	12.9(1.0)
1966	40.0	4.6(0.4)	57.3(1.6)	26.9(0.7)	2.1(0.5)	9.1(0.9)
1967	44.3	6.3(0.5)	38.0(1.9)	47.8(0.8)	1.2(0.6)	6.9(1.1)
1968	23.7	12.1(0.7)	24.6(2.7)	52.9(0.8)	1.6(0.6)	8.8(1.4)
1969 ³	27.3	8.2(0.6)	22.2(2.5)	41.5(0.7)	3.8(0.9)	22.5(1.7)
1970 ³	47.0	5.0(0.4)	24.7(2.0)	25.3(0.6)	9.1(0.9)	34.7(1.5)
1971 ³	52.6	4.4(0.5)	18.9(2.4)	26.8(0.7)	10.9(0.5)	38.9(1.7)

Notes:

- ¹ represents authorisations to share milkers;
- ² includes additional stock and plant;
- ³ excludes small proportion of funds allocated to Lands Department settlers.

Only two of these markets are uniquely identified.

Specific limits are placed by Government on the Corporation's ability to lend for purchase and refinance purposes. These limits were \$8 million and \$5 million respectively for the financial year 1970/1. The overall limits are broken down to individual limits at each branch. The criterion used is "rule-of-thumb", based on **past** patterns of lending for this purpose, and the number of farms in the branch's hinterland. The imposition of annual limits may induce resource misallocation, through the "first come-first served" allocative mechanism. This hypothesis is subsequently examined (13.15).

B PRICING ASPECTS13.9 Cost of Capital

Corporation loan capital consists of issued stock and drawings from the National Development Loans Account. The Corporation's close relationship with Government ensures that capital is raised at a lower cost than on the open market. The average cost of capital has been increasing in recent years, largely as a result of the effect of maturing stock issues issued at historically low interest rates. Whilst there is no legal limitation on the Corporation's ability to raise stock, these proposals have in the past been vetoed by Treasury. As a result, the proportion of Development Loans Capital to total Capital, charged at a flat $4\frac{1}{2}\%$ rate of interest, has been increasing. For the year ending 31st March 1971, the average cost of Corporation capital was 4.00%, but the marginal cost was 4.50%. The average cost has increased by 0.33% from 3.67% over the seven year period from 1964.

The direct cost of funds lent to each sector will be a function of:

- (i) the volume of new Loans Account drawings lent to that sector, at a $4\frac{1}{2}\%$ rate of interest;

- (ii) the volume of repayment funds re-lent to that sector (13.8), that may be envisaged as having a direct cost equal to the Corporation's average cost of capital. The direct average interest cost to the Corporation of making new loans (Table 13.4) shows that the direct cost of making rural and industrial loans has been greater than the cost of making urban loans. This is because the rural and industrial sectors utilise relatively more of the new loans capital each year than the urban sector, which relies relatively more on the repayment of existing loans.

Table 13.4

Average Direct Cost of Making New Loans to Sectors (%)

<u>Y/e 31st March</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>
Rural	4.29	4.23	4.20	4.24	4.30
Urban	4.09	4.01	4.13	4.13	4.16
Industrial	4.40	4.38	N/A	4.43	4.39

13.10 Direct Incidental Cost

No attempt is made by the Corporation to estimate the incidental costs of loan administration and control, but the time cost is believed to be independent of loan volume and purpose. This cannot be uniquely identified as a result of the generally fixed nature of time costs, and problems of joint-costing of staff carrying out a number of duties.

13.11 The Risk Cost

Two risk costs can be envisaged; risk of total default and risk of arrears. Corporation gross and net

losses written off have been small in recent years. During

Table 13.5

Proportion of Accounts in Arrears, and Average Amount Owning
(Financial Year 1970-71)

<u>Date</u>	<u>All Farm</u>	<u>Dairy</u>	<u>Sheep</u>	<u>Other Farm</u>	<u>Urban</u>
31.5.70	2.38 (\$724)	1.43 (\$443)	3.41 (\$909)	3.75 (\$311)	6.66 (\$98)
31.8.70	2.82 (\$699)	1.95 (\$364)	3.76 (\$943)	4.22 (\$333)	6.42 (\$100)
31.11.70	5.68 (\$451)	5.32 (\$274)	5.99 (\$657)	7.14 (\$247)	7.23 (\$97)
28.2.71	3.22 (\$731)	1.67 (\$542)	4.82 (\$853)	5.65 (\$316)	7.80 (\$99)

The average sum outstanding is lower in the urban than in the rural sector. Data from Table 13.5 reflect short term arrears as in many cases arrears are subsequently capitalised. In these cases the effect of arrears is:

- (i) to reduce short-term repayments, and increase the emphasis on borrowed Loans Capital to meet sector requirements;
- (ii) to increase the average length of mortgage term.

However, the observed proportion of accounts in arrears is small and the conclusion is that the total "risk" cost of lending is small.

13.12 Loan Pricing

There are three features of loan pricing:

- (i) the rate of interest charged on mortgages;
- (ii) the contribution to Reserve Fund;
- (iii) the application fee on rural loans.

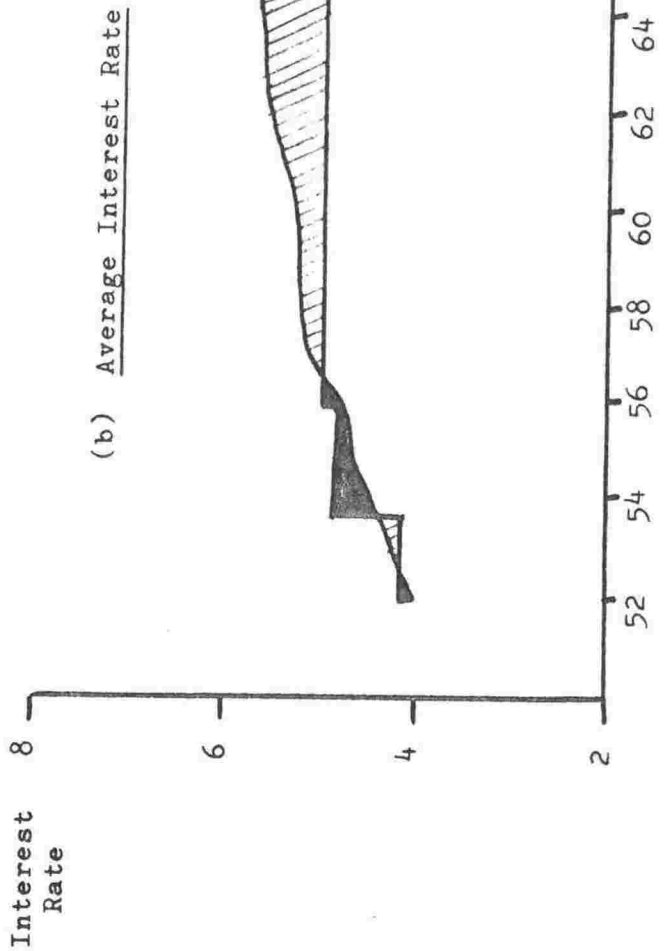
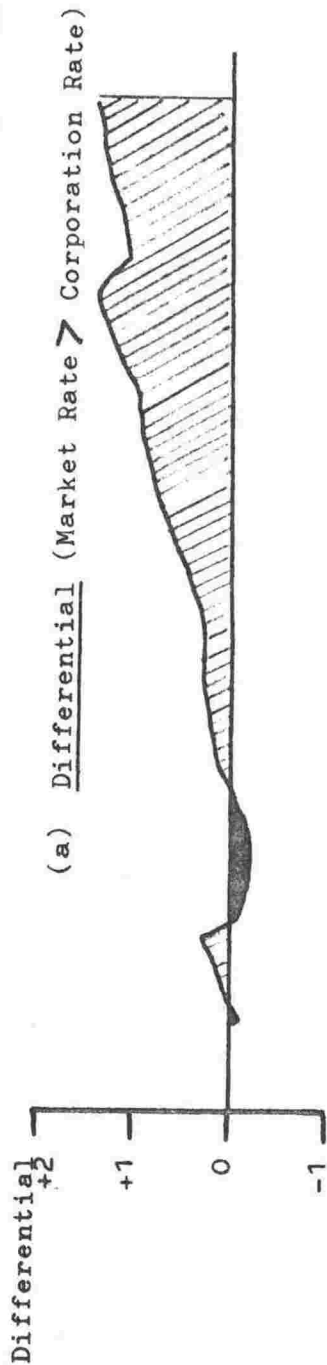
On (i) - Interest Rates: The Corporation's Act permits flexible pricing in theory, and rates are charged under s(23), ss(2) and (3), of the 1965 Act. The clauses state that:

Ss(2) "The Corporation shall from time to time fix the rates of interest to be paid upon money lent by the Corporation so as to make adequate provision to cover the costs of administration and for all other matters incidental to the proper functioning of the Corporation".

Ss(3) "Different rates of interest may be fixed (under ss(2) of this section) in respect of different securities or different classes of security or in respect of different portions of the same loan".

The rates charged by the Corporation on first rural mortgage lending have been plotted (Fig. 13.2) for the period from March 1952. A calculated average "market" interest rate on new rural mortgages (excluding the Corporation component) has also been plotted. The heavily

Fig. 13.2 Corporation Rural Lending Rates Relative to Market Rates



CORPORATION INTEREST RATES
(1st Rural)

		%
Jan. '54-Mar. '56	-Dec. '53	4 $\frac{1}{2}$
Apr. '56-Mar. '67		4 $\frac{3}{8}$
Apr. '67-Jun. '71		5
Jun. '71-		5 $\frac{1}{2}$

See text.

Source: Monthly Abstract of Statistics (various)

shaded area represents time periods when Corporation rates were in excess of market rates, and the hatched areas the converse. In recent years the market rate differential over the Corporation rate has been increasing, and in March 1971 stood at 1.4%.

This differential can be envisaged as an interest rate subsidy to Corporation rural borrowers, over open-market borrowers. The subsidy can be expressed as a percentage of the initial loan value granted, under the following procedure:

- (i) calculate the annual instalment of a Corporation table mortgage, given terms and rate of interest;
- (ii) calculate the annual instalment on a similar "market rate" mortgage;
- (iii) calculate the excess payment of (ii) over (i);
- (iv) assuming this to be an annuity, discount by the rate representing alternative investment (taken to be current return on Government stock), to give the present value of this excess.
- (v) express (ii) as a percentage of the initial value of the Corporation mortgage to give the interest rate subsidy.

The methodology may be criticised as it assumes that all rural mortgages are table, and that the current return on Government stock is a relevant and constant discounting factor. However, some arithmetical examples are presented (Table 13.6) that do indicate the potential inbuilt benefit to the farm community of below market interest rates.

Table 13.6

The Effect of the Interest Rate Subsidy
(% of Principal Lent)

Market Interest Rate Diff. (SAC Rate 5½%)	+½%			+1%			+1½%			
Term of Mortgage (years)	10	25	40	10	25	40	10	25	40	
Discounting Factor (%)	5	2.5	5.2	7.1	5.0	10.5	14.4	7.5	15.9	21.8
	5½	2.4	4.8	6.6	4.9	10.0	13.4	7.3	15.1	20.4
	6	2.4	4.7	6.2	4.7	9.5	12.6	7.1	14.4	19.1
	6½	2.3	4.5	5.9	4.5	9.1	11.8	7.0	13.8	17.9

Mortgage terms and the interest rate differential were observed to determine the magnitude of the subsidy rate. Loan size had no relevance. The subsidy rate was observed to accelerate as the interest differential widened, given mortgage terms and the alternative investment opportunity. Conversely, the subsidy was observed to decelerate as the rate of return on alternative investment increased, given the interest rate differential. Given this differential, and the alternative rate of return, the subsidy

rate was observed to increase at a decreasing rate as the length of mortgage term increased. The converse also held. As a further corollary, if the interest rate differential were negative (i.e. the Corporation interest rate were greater than market rate), then the subsidy may be envisaged as logically equivalent to an indirect tax on Corporation mortgage holders. The percentage burden of this tax would be less than the subsidy arising from an equivalent positive differential. Corporation loans are granted on a medium and long term basis, and with the observed increase in interest rate differential (Fig. 13.6) the subsidy rate to new borrowers has been increasing and offers very real benefit to Corporation borrowers. On the other hand it discriminates against farmers who are forced to raise finance on the open market.

As a result of the 1971 Budget decision, Corporation rural interest rates have been modified on to a two-tier system. The Minister of Finance stated that:²

(i) (for development and additional land purposes)

"... loans of not more than \$30,000 will continue to bear interest at the present rates (5½%): loans above that limit will bear interest at the present rates on the first \$30,000, and at market rates (i.e. 7%) on the remainder..."

² Budget 1971. Financial Statement to the House of Representatives: R.D. Muldoon, 10 June 1971, p. 19.

- (ii) "... Market rates of interest (7%) will be charged on... refinance and new purchase loans".

The effect of these rate increases on development and restructuring loans is small and the above analysis is therefore still relevant. The average development loan authorised during 1970/1 was \$7,681, and for restructuring purposes, \$19,710, well under the \$30,000 limit. In any case, the effective rate of increase in interest rate on a \$40,000 loan of 25 years would only be 0.38%, and 0.61% on a \$50,000 loan, both of which are marginal. The effect of the increase on purchase and refinance loans is more significant, though Corporation rates are still cheaper than ruling institutional rates (around 8% in June 1971).

On (ii) - Reserve Fund Contribution: The effective interest rate on rural loans is increased as a result of the 2% (of principal) contribution by borrowers to the General Reserve Fund of the Corporation, under s(27), ss(2) of the 1965 Act. The effect of this contribution on a long term low interest rate loan is small. For instance, on a $5\frac{1}{2}\%$ 25-year term loan, the Reserve Fund contribution will raise the effective rate of interest by less than $\frac{1}{4}\%$.

The nominal rate of interest and the term of loan will determine the effect of Reserve Fund contribution. Given the 2% rate of contribution, an increase in loan term coupled with a decrease in the nominal rate of interest, will have the effect of lowering the effective rate of interest charged. Only on a short

term high interest rate loan will the effective rate of interest be increased markedly (a maximum of 2% is theoretically possible). These loans are inconsistent with Corporation policy, and as a result the Reserve Fund contribution has little effect on pricing.

On (iii) - Application fees: A fee is charged on all rural loan applications. The scale of fees at June 1971 was:

New loan - \$20 up to \$4,000, plus \$3 for each additional \$2,000 or part thereof.

Further advance or stock loan - \$10 up to \$2,000, plus \$3 for each additional \$2,000 or part thereof.

The fees are scaled according to loan volume and are intended to cover direct costs of loan inspection and administration. Actual costs are not believed to be related to loan volume (13.12) and the fees scale is therefore discriminatory against larger loans. A more efficient method of fee pricing would be to charge a flat fee, together with a variable charge, to cover costs such as travel and time inspection.

It is Corporation policy to return fees in whole or in part if an application is declined. This policy is inefficient, as variable inspection and other costs have been incurred. An efficient application fee pricing procedure would demand that:

- (i) a flat consultation fee be charged for an initial uncommitted opinion by the Corporation as to the merits and likely success of a proposition;

- (ii) assuming a proposition satisfies (i) above, or a prospective borrower wishes to proceed regardless of (i) above, a second fee as outlined.

The concept of fee return is not consistent with any efficiency criteria.

13.13 Marginal Cost Pricing

Current rates of interest on rural loans cover the direct cost of raising loanable funds.

The differential between the direct cost of financing urban and rural loans is not reflected in pricing (Table 13.4). Management expenses are fixed but Corporation apportionment estimates indicate that average management expenses per \$100 invested were \$0.38 for rural lending, and \$0.40 for urban lending, during the financial year 1970/1.

There is a standard interest rate differential of $\frac{1}{2}\%$ on rural loans where first security is not taken. The Corporation considers that this differential is sufficient to cover all "risk". The interest rate range is small and therefore security quantity and quality must be envisaged as rationing devices.

Some evidence of marginal pricing is apparent in application fee charges. The application fee for stock loans and subsequent loans is lower than for new loans. Both these applications are less expensive to process. However, the current system of application fee charges has been shown to be inefficient (13.12).

In conclusion, the standard rates of interest and other charges do not comply with marginal pricing principles. The Reserve Fund contribution is akin to a proportional average tax, and does not relate to the marginal risk of loan default. However the pricing mechanism is fixed by Government and plays a relatively minor role in loan allocation.

C ALLOCATION ASPECTS

Four aspects of loanable funds allocation have been examined:

- (i) to determine that past lending has produced positive returns (13.14);
- (ii) to assess the validity of the "first come-first served" funds allocation principle (13.15);
- (iii) to assess the reasons for loan declines (13.16);
- (iv) from a sample of cases, to determine the extent of past misallocation on loans where principal and interest payments have been deferred (13.17).

13.14 Returns from Rural Lending

(Some material in 13.14 and in subsequent sections has been collected by the Research Section of the

Corporation in a number of projects directed by the author).

As limited data is available on the success of Corporation lending, it is difficult to assess the returns on lending and the extent of yield differentials, given current funds allocation.

A Development Loans

A 5% random sample survey was carried out from Corporation files to determine the success of development lending ("development loans" defined to include at least a 75% development content). The effect of loans granted during the financial years 1966/7 and 1970/1 were compared, though actual performance data was not available for the year 1970/1. 2,827 development loans were granted during 1966/7, and 1,833 during 1970/1.

(i) Sheep Farm Development Loans (1966/7)

The carrying capacity increases are recorded in Table 13.6.

Table 13.6

Carrying Capacity Increases on Sheep
Farms Granted Development Loans
 (Sample Size - 92)

<u>Stock Units Carried</u>	<u>Actual</u> <u>66/7</u>	<u>Est-3 year</u> <u>Potential</u>	<u>Actual</u> <u>68/9</u>	<u>Actual</u> <u>69/70</u>
Mean	2,210	2,903	2,851	3,049
Standard Deviation	1,168	1,813	1,767	1,872
Increase from 1966/7 (%)		+31.4	+29	+38
National Increase (%)			+5.4	+4.5

¹ As at June 30th.

There were significant increases in mean actual stock numbers on farms granted development loans (t-test) but the actual variance was greater than estimated variance, as some farms performed better and others worse than estimated.

The increase in stock numbers was accompanied by an increase in debt (Table 13.7), but from statistical testing (t-test), there was a 35% probability that this increase was a result of chance factors.

Table 13.7

Average Debt Changes as a Result of Sheep Development
Loans Granted During 1966/7
 (Sample Size - 92)

<u>Debt per S.U. (\$)</u>	<u>As at 66/7</u>	<u>Post Devpt.</u> ¹
Mean	12.51	13.30
Standard Deviation	8.11	6.71

¹ As at June 30th.

The average sheep development loan granted during the financial year 1966/7 was \$11,168 (+ \$8,973).

(ii) Sheep Development Loans (1970/1)

Statistical testing of the estimated increases in carrying capacity from loans granted during 1970/1 (Table 13.8) show that there was a 30% probability that observed differences were a result of chance factors. This suggests that 1970/1 loans were granted relatively more for directly non-productive purposes (such as buildings) than in 1966/7, when more ~~emphasis~~ ^{nationally} was placed/on direct stock number increases.

Table 13.8
Estimated
Carrying Capacity Increases on Sheep
Farms Granted Development Loans (1970/1)
(Sample Size - 48)

<u>Stock Units Carried</u>	<u>1970/1</u>	<u>Est. 3 year potential</u>
Mean	2,956	3,646
Standard Deviation	2,199	2,584
Increase		+23

The rate of increase in carrying capacity as a result of loans granted was lower than in 1966/7, but the average size of basic unit upon which loans were granted was significantly higher. Average loans granted in 1970/1 were \$10,648 (+ \$6,967), and these were not significantly different to those granted in 1966/7.

The ex-post and ex-ante average debt situation (Table 13.9) indicates a 90% probability of no significant difference between debt levels. The conclusion was that farms granted development loans were estimated to increase carrying capacity with no increase in debt per stock unit.

Table 13.9
Average Debt Changes as a Result of Sheep Development
Loans Granted (1970/1)
(sample size - 48)

<u>Debt per S. U. (\$)</u>	<u>70/71</u>	<u>Post Devpt. (est).</u>
Mean	14.11	13.88
Standard Deviation	8.70	6.36

(iii) Dairy Development Loans (1966/7)

There were significant increases in production levels on properties granted development loans in 1966/7 (Table 13.10).

Table 13.10
Production Increases on Dairy Farms
Granted Development Loans (1966/7)
(sample size - 49)

<u>Production</u> (lbs. Milkfat)	<u>Actual 66/7</u>	<u>Est-3 year</u> <u>Potential</u>	<u>Actual 68/9¹</u>	<u>Actual 69/70¹</u>
Mean	24,336	30,766	30,626	31,669
Standard Deviation	9,104	11,248	13,401	15,230
Increase from 1966/7 (%)		+26.4	+25.8	+30.0
National Increase in prodn. (%)			+ 1.6	- 6.1

¹ As at June 30th.

Actual production variance was greater than estimated variance, as a result of some farms exceeding estimated potential, and some farms not achieving estimated potential.

Increased production was not accompanied by any significant increase in average debt level (Table 13.11). There was a 50% probability that the observed increase in debt per pound of milkfat was a result of chance factors.

Table 13.11

Average Debt Changes as a Result of Dairy
Development Loans (1966/7)
(Sample Size - 49)

<u>Debt per lb. Milkfat</u> <u>(\$)</u>	<u>Actual</u> <u>66/7</u>	<u>Post Devpt.</u> <u>(est.)</u>
Mean	0.84	0.93
Standard Deviation	0.68	0.45

¹ As at June 30th.

The average dairy development loan granted during 1966/7 was \$5,641 (+\$3,865).

(iv) Dairy Development Loans (1970/1)

There was a 35% probability that changes in production as a result of dairy development loans granted during 1970/1 were a result of chance factors (Table 13.12). This suggests that 1970/1 loans were granted relatively more for directly non-productive purposes than in 1966/7.

Table 13.12

Estimated Production Increases on
Dairy Farms Granted Development Loans (1970/1)

<u>Production</u>	<u>Actual 70/1</u>	<u>Post Devpt. (est.)</u>
(lbs. milkfat)	25,361	30,427
Mean	8,767	8,382
Standard Deviation		
Increase in production		
(%)		+20

There was no significant difference between actual production levels on farms granted loans in 1966/7 and 1970/1, but the rate of increase in estimated production potential has fallen. There was no significant decrease in estimated average debt per pound of milkfat as a result of development loans being granted (Table 13.13).

Table 13.13

Average Debt Changes as a Result of
Dairy Development Loans (1970/1)

<u>Debt per lb. Milkfat (\$)</u>	<u>Actual 70/1</u>	<u>Post Devpt.</u>
Mean	1.04	1.03
Standard Deviation	0.88	0.73

The conclusion was that on farms granted development loans during 1970/1, there was an estimated increase in production, but no increase in relative debt. The average size of dairy development loans granted during 1970/1 was \$5,353 (+ \$3,602).

(v) The Return from Development Lending

In general, the marginal return from development lending, y , can be expressed,

$$y = \frac{\sum_{i=1}^n \left(\frac{P_{ij} \cdot \Delta_{ij}^0 - (C_{ij} + M_{ij})}{(1+r)^i} \right)}{D} + w_{ij}$$

Where P_{ij} = price of commodity j , year i .

Δ_{ij}^0 = marginal output in year i of commodity j , resulting from development loan, D .

C_{ij} = marginal cost of producing j , year i .

M_{ij} = annual mortgage instalment repayment.

r = discounting factor.

w_{ij} = welfare yield from loan.

There are identification difficulties in determining marginal loan returns and costs. However a crude estimate of development returns is calculated on the assumptions that:

- (i) production acceleration effects of a development loan are exhausted after three years;
- (ii) $C_{ij} = 0.5 (P_{ij} \cdot \Delta_{ij}^0)$;
- (iii) $r = 5\frac{1}{2}\%$ (Corporation's lending rate);
- (iv) increases in production are attributable solely to borrowing;

(v) average nationally received prices of milkfat and sales of sheep reflect prices received on development loan farms;

(vi) $w_{ij} = 0$.

Calculated partial returns (Table 13.14) indicate that development loans have produced relatively high returns at the margin per dollar lent, and this is confirmed by the above data, where production increases have occurred, without significant increases in average debt loads.

Table 13.14

Partial Returns (Three Years Data)
from Development Lending, 1966/7 and 1970/1

	<u>1966/7 Loans</u>	<u>1970/1 Loans</u>
Sheep Loans	16.7	7.7*
Dairy Loans	16.3	11.4*

* Estimated prices.

B Restructuring Loans

Restructuring loans have assumed increasing importance in the Corporation's lending pattern in recent years (Table 13.3). To evaluate the effects on production and debt servicing ability of newly created units, a 10% random sample of the 1,034 restructuring loans granted during 1970/1 was taken. Results (Table 13.15) showed that:

- (i) as a result of restructuring loans, there have been significant increases in the size (as measured by production potential) of units;
- (ii) the increase in debt load on sheep units (per stock unit) was not significant (t-test), and the mean increase was only 10%. There was a significant increase in the debt load of newly created dairy units, on the basis of debt per pound of milkfat.

An estimate of the return per dollar invested in a restructuring loan is subject to the same identification problems as in (A) above. A partial estimate, based on three years estimated performance/debt data, and formula (A1) above, gives a return on mean sheep restructuring dollar loans of 4.9%, and a return of 1.8% on dairy restructuring dollar loans. This estimate is crude as a result of imperfect data. It also makes no allowance for additional internal business scale economies, or the "strength" advantage of larger units. The crude returns show that marginal changes in debt are far greater than changes in production capacity.

C Returns on Other Lending

A vital necessity is the need for future reserve to determine the returns from stock loans, refinance loans and purchase loans. From the above figures, partial returns from development lending

Table 13.15

The Effect of Restructuring Loans on Production
and Debt Levels of Newly Created Sheep and Dairy Units
(1970/71)

(a) Sheep Units* (sample size - 55)

<u>Original Base Unit</u>							
Production Range (S.U.)	No. of Farms (%)	Average Debt (\$)	Debt/S.U. (\$)	Newly Created Unit	No. of Farms (%)	Average Debt (\$)	Debt/S.U. (\$)
0 - 1,5000	14.5	17,902	16.30	0 - 1,500	-	-	-
1,501 - 2,000	32.7	32,963	19.40	1,501 - 2,000	9.1	53,844	30.50
2,001 - 3,000	27.3	33,759	13.70	2,001 - 3,000	30.9	53,028	20.10
3,001 - 5,000	16.4	27,569	7.10	3,001 - 5,000	41.8	58,641	15.10
5,001 and over	9.1	92,782	11.20	5,001 and over	18.2	97,695	11.22
AVERAGE: 2,511 S.U.	100	32,141	12.80	3,514	100	49,547	14.10

* includes cropping as a feature of some units.

(b) Dairy Units (sample size - 47)

Original Base Unit		Newly Created Unit	
Production Range (lbs. Milkfat)	No. of Farms (%)	Debt/lb. Milkfat (\$)	Debt/lb. Milkfat (\$)
0 - 20,000	19.1	10,900	0.60
20,001 - 25,000	17.0	17,152	0.74
25,001 - 30,000	17.0	18,720	0.67
30,001 - 40,000	25.5	17,944	0.50
40,001 and over	21.4	41,930	0.67
AVERAGE: 27,895 lbs. Milkfat	100	17,574	0.63

Original Base Unit		Newly Created Unit	
Production Range (lbs. Milkfat)	No. of Farms (%)	Average Debt (\$)	Debt/lb. Milkfat (\$)
0 - 20,000	19.1	10,900	0.60
20,001 - 25,000	17.0	17,152	0.74
25,001 - 30,000	17.0	18,720	0.67
30,001 - 40,000	25.5	17,944	0.50
40,001 and over	21.4	41,930	0.67
AVERAGE: 27,895 lbs. Milkfat	100	17,574	0.63

have been high, but returns from restructuring lending have been lower, as a result of the heavy land purchase capital outlay.

13.15 Applications and Authorisations

The Corporation's rural lending policy is governed by the overall funds allocated to it by Government, and by specific limits imposed for purchase and refinance lending (13.9). Funds restrictions might induce inefficient resource allocation as a result of the "first come-first served" principle i.e. funds are expended freely early in the financial year, and sound propositions are declined later, as a result of funds shortages.

Evidence of this principle was sought from an investigation of application and authorisation flow data from Corporation files, for the financial year 1970/1. The Corporation's accounting control procedure is based on 13 four-weekly periods. Ceteris paribus, if the total application for and authorisation of funds over the financial year were to occur at random, then 7.7% of the annual ex-post dollar volume of applications and authorisations might be expected to occur in each period. This would ignore time lag effects.

Cumulative proportional flows over the 13-week period were calculated, and the deviation calculated from a "random" cumulative flow. The resultant statistic may be envisaged as

akin to a second derivative and plotted graphs visually highlight the seasonal properties of lending flow, and the validity of the "first come-first served" hypothesis. An example of the deviation calculation is given (Table 13.7).

Table 13.17

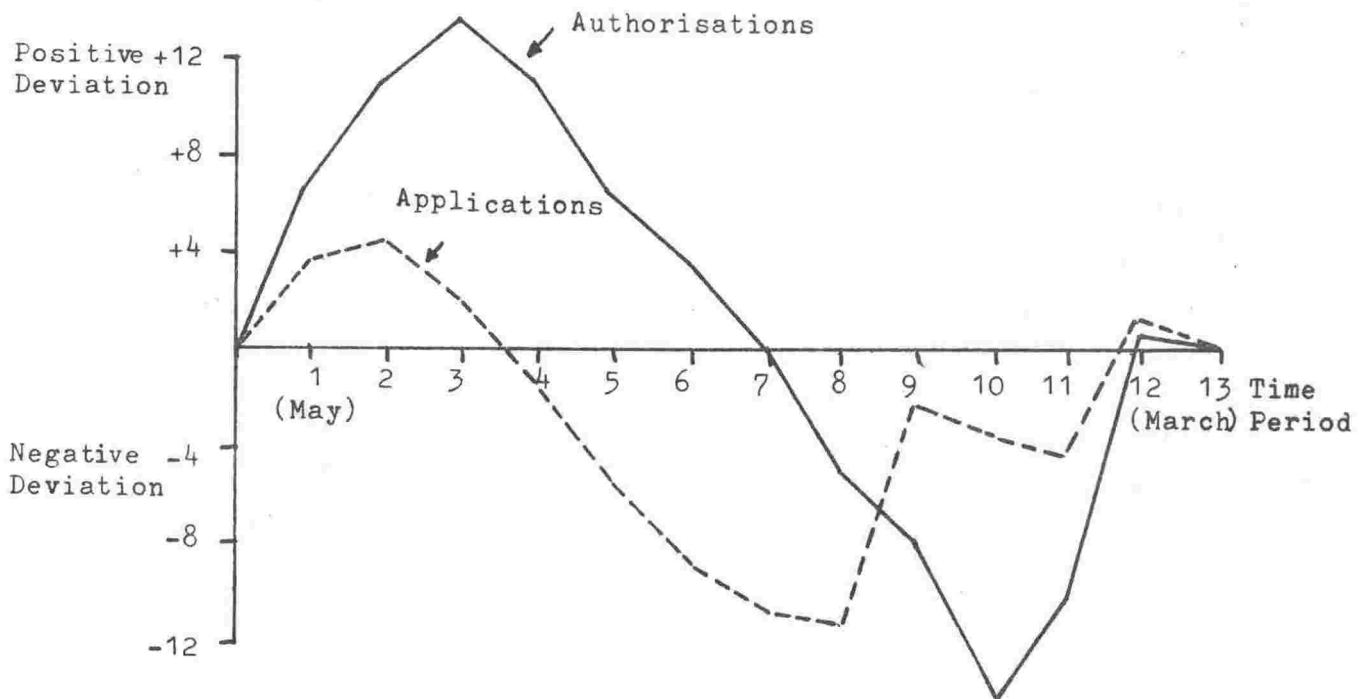
Flow of Dollar Applications for Purchase Loans
(1970-71 data)

<u>Period</u>	<u>Applics. (\$m)</u>	<u>Cum.(\$m)</u>	<u>Cum. %</u>	<u>Deviations from Random (%)</u>
1	2.62	2.62	11.5	+ 3.8
2	1.96	4.58	20.1	+ 4.7
3	1.17	5.75	25.2	+ 2.1
4	0.95	6.70	29.5	- 1.3
5	0.86	7.56	33.2	- 5.3
6	0.93	8.49	37.3	- 8.9
7	1.27	9.76	42.9	-10.9
8	1.67	11.43	50.2	-11.3
9	3.73	15.16	66.7	- 2.5
10	1.49	16.65	73.2	- 3.7
11	1.55	18.20	80.0	- 4.6
12	2.83	21.03	92.5	+ 0.2
13	1.71	22.74	100.0	

(a) Farm Purchase

June 30th is the customary date of dairy farm transfer and sheep farms traditionally change hands during the winter months.

Fig. 13.3 Purchase Lending - Changes in Seasonal Flow of Applications and Authorisations (1970-71 data)



The rate of change in demand for purchase finance showed an increase to July and a subsequent decline through to November (Fig. 13.3). Applications also showed an increasing trend from November to March.

Given the fixed purchase limit (13.9), loan authorisations were accelerating early in the financial year and from early January to the end of the financial year. There was an observable relationship between rates of change of application and authorisation. Figure 13.3 shows that funds were initially expended in line with demand and then held back, to correspond with the increase in demand later in the financial year. As such the data does not support the "first come-first served" hypothesis for 1970/1 purchase lending.

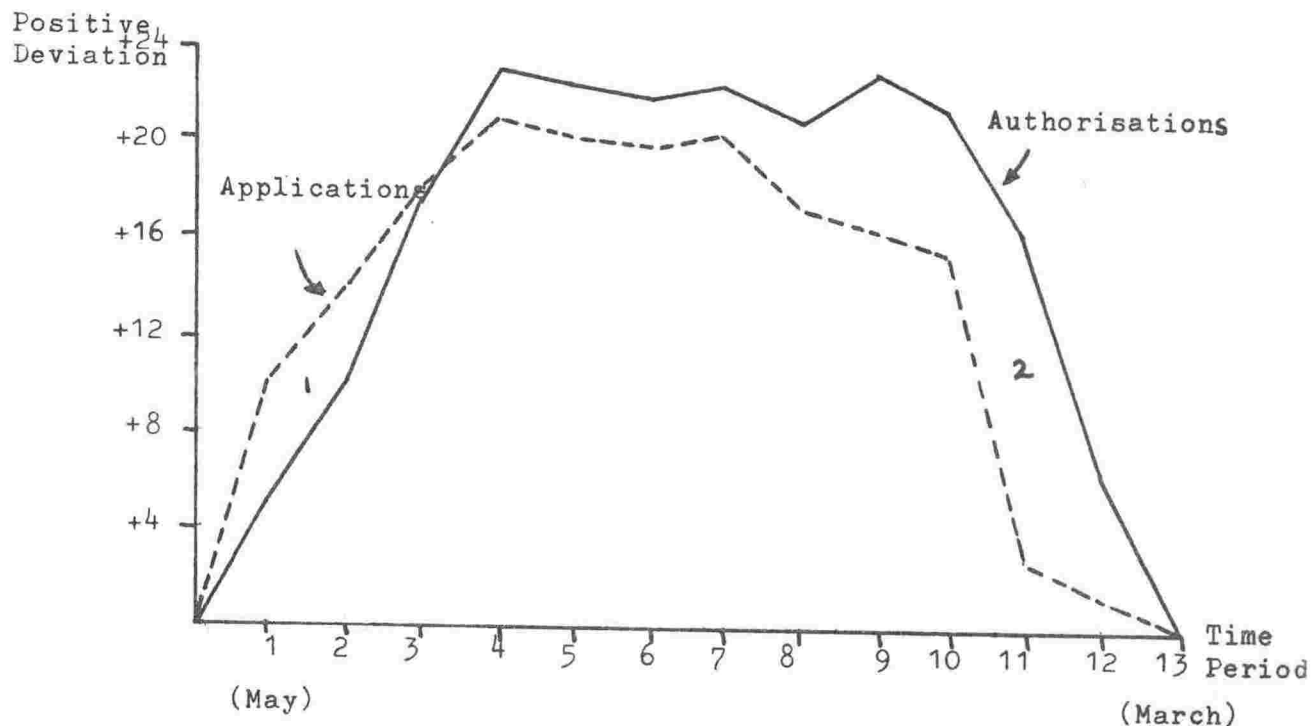
(b) Refinance

Traditionally the demand for refinance loans occurs during the Autumn months as stock firms particularly, attempt to reduce debit balances before their balance sheet dates. Figure 13.4 supports this observation. Both applications and authorisations were accelerating early in the financial year, then held constant and subsequently declined. The relationship was close and the data does not support the "first come-first served" thesis, as demand appeared to be counteracted by supply. The data does not show whether the observed decline in demand for funds is a result of:

- (i) real market forces or;
- (ii) a diffusion of information to the farm community and other institutions that funds for refinance purposes have been fully utilised.

It may be that there is a state of suppressed demand, but there is no way of determining this.

Fig. 13.4 Refinance - Changes in Seasonal Flow of Applications and Authorisations (1970/1 data)



- Notes: (1) applications increasing at a faster rate than authorisations;
- (2) applications decreasing at a slower rate than authorisations.

The overall conclusion is that observed data does not support the "first come-first served" thesis of funds allocation for purchase and refinance purposes, under given limits.

Whilst other funds uses are not uniquely identified in terms of aggregate funds limits, flow charts can be drawn to describe the broad features of the market for development and amalgamation finance in 1970/1. In these cases random deviations have been

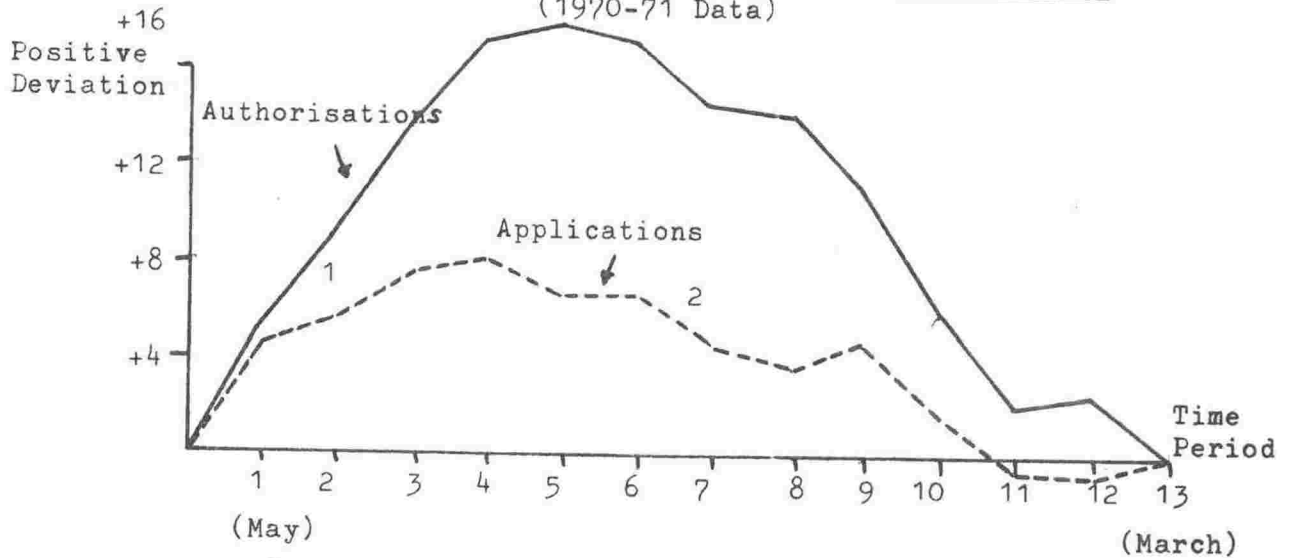
plotted from the cumulative percentages of the ex-post volume of funds applied for and authorised during the financial year. During that year, financial reports submitted to Corporation Directors took note of the heavy volume of funds lent for restructuring purposes. The Report of January 13th 1971 noted that:

"... action has been taken in recent months to reduce the level of lending for the purchase of additional land for farm amalgamation..."

Applications for finance to purchase additional land were accelerating early in the financial year and subsequently showed stability and decline (Fig. 13.5). The flow of authorisations was accelerating at a faster rate than applications and showed a faster rate of deceleration. Figure 13.5 shows visually that whilst applications for restructuring purposes were fairly stable throughout the year, an increasing proportion were declined as the overall aggregate funds limits were approaching. The figure therefore tends to support a "first come-first served" thesis, ignoring any time lag effect, with the overall funds limit imposed on the Corporation by Government exerting an important allocative effect.

Similar conclusions were observed in the market for development loan finance (Fig. 13.6). The proportion of applications lodged through the year was relatively stable, indicating perhaps that the revealed demand for development finance is independent of seasonal influences. Ex-post authorisations were accelerating at a

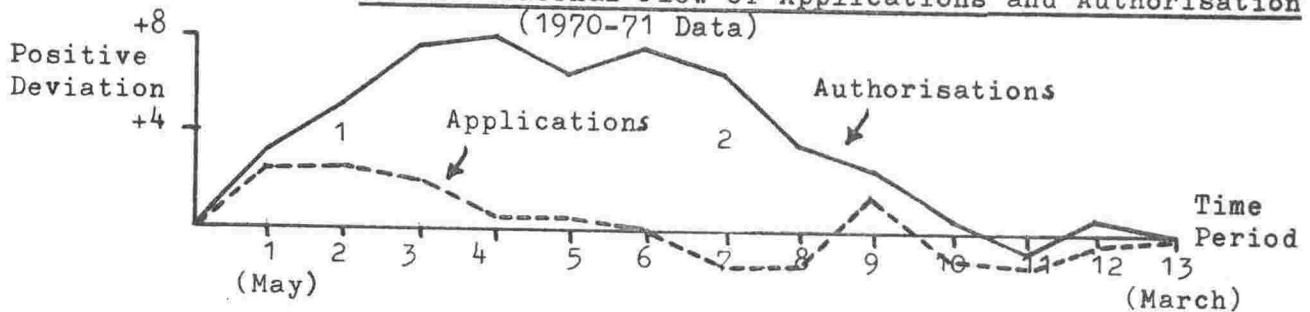
Fig. 13.5 Restructuring Loans - Changes in the Seasonal Flow of Applications and Authorisations
(1970-71 Data)



- Notes: (1) authorisations increasing at a faster rate than applications;
(2) authorisations decreasing at a faster rate than applications.

faster rate than ex-post applications, showed subsequent stability, and showed a faster rate of decline than applications.

Fig. 13.6 Loans for Development - Changes in the Seasonal Flow of Applications and Authorisation
(1970-71 Data)



- Notes: (1) authorisations increasing at a faster rate than applications;
(2) authorisations decreasing at a faster rate than applications.

In conclusion, the investigation of the sub-markets for farm finance has shown that:

- (i) the market for purchase and refinance purposes is uniquely identified, as a result of Government imposed limits. Flow investigation does not support the "first come-first served" hypothesis;
- (ii) given overall funds limits, and (i) above, remaining funds are allocated primarily for restructuring and development purposes (Table 3.3). On the basis of one year's data, the "first come-first served" hypothesis is supported and this may have implications on the overall efficiency of resource allocation, since satisfactory projects may be turned down as a result of funds shortages.

13.16 Loan Declines

The number of authorised loans as a percentage of the number of rural applications has remained relatively constant in recent years (Table 13.8). There has been a downward trend in authorisations as a percentage of applications by volume, and a consequent decline in the volume/number relationship. The table suggests that smaller loans than requested are being increasingly granted, or that larger loans are being declined. An inefficient allocation of

loanable funds might result from such a "pruning" policy. Alternatively, loan applications declined as a result of funds shortages rather than economic factors may also lead to inefficiency.

Table 13.8

Rural Authorisations as a Percentage of Applications

Y/e 31 March	(i) By Number	(ii) By Volume	(iii) Volume/Number Relationship
1964	84.7	81.5	96.2
1965	84.1	78.5	93.3
1966	84.6	79.2	93.6
1967	78.1	68.1	86.1
1968	80.5	68.8	85.5
1969	84.7	68.2	80.5
1970	78.7	64.2	81.6
1971	80.0	65.4	81.8

To determine the reasons for loan decline an examination was made of:

- (i) all purchase declines during the 1970/1 financial year;
- (ii) a sample of non-purchase decline files during the 1970/1 financial year.

The study was restricted to 1970/1 data as previous years declines files were destroyed.

On (i) - Purchase Declines: During the financial year 1970/1, 802 applications were made for farm purchase finance, and 715 decisions were made.³ Of these decisions, 367 or 51.3% were

³ Some of these decisions related to 1969/70 applications.

approvals (utilising the full limit for purchase finance), and 348 or 48.7% were declines. Of the declines, 191 were on the grounds of "funds" shortage, and 157 for "other reasons". Declines on "funds" grounds were heavy early and late in the financial year and there was no evidence of an increase in the volume of declines on "funds" grounds during the year, as the overall purchase funds limit was approached.

Branches have delegated authority to decline farm purchase applications on "funds" grounds. Declines on these grounds are made as a result of non-compliance with one or more of the following conditions:

- (i) that the branch has used up its full quota of purchase funds;
- (ii) that applicants are a minimum of 25 years of age;
- (iii) that applicants have been engaged in farming for a minimum of five years;
- (iv) that there is scope for "worthwhile increased production" on the property;
- (v) that applicants are able to contribute "at least" 30% of the ingoings in cash, of which an "acceptable" proportion represents personal saving;

- (vi) that applicants "genuinely" need assistance, i.e. those with substantial assets are directed elsewhere.
- (vii) that the applicant has not previously owned a "reasonable" economic unit;
- (viii) that the applicant is a British subject, either by birth or naturalisation.

These requirements are therefore rationing devices for what may be sound economic propositions. In particular, the phrases "worthwhile increased production", "acceptable proportion of personal savings", and "reasonable economic unit" are capable of, and are given wide interpretation. These rationing requirements are discriminatory and at variance with Corporation goals as:

- (a) these devices preclude, through (vii), a natural progression of farmers through farm units, to reach their optimum sized unit with Corporation finance;
- (b) the requirements effectively preclude young trained farmers without substantial capital from owning a property;
- (c) the requirements preclude the establishment of young farmers into the industry on fully developed units, through (iv) above.

Information was available on all 157 declines made on non-funds grounds during 1970/1. (Table 13.9).

Table 13.9

<u>Purchase Finance: "Non Funds" Reasons for Decline*</u>	
<u>During 1970/1 Financial Year</u>	
<u>(Population - 157)</u>	
Inability to service debt	28.7
(Heavy debt in relation to production potential)	
Uneconomic property (physically limited production potential)	28.0
Borrowing in excess of limits (13.5)	26.8
Excessive price of property	15.3
Insufficient security	7.6
Other	26.0

* In some cases multiple reasons were recorded.

In no case examined was there evidence of inconsistent behaviour by the Corporation, given its goals.

The modal decline case was that of a farmer wishing to purchase a unit with limited production potential and with heavy external borrowing. Considerable research is needed into the motivations of these prospective borrowers. Committing resources to the purchase of these units is inefficient in that it would:

- (i) be inconsistent with Corporation goals;
- (ii) have the effect of further reducing the levels of return agriculture, relative to the capital committed, since land prices are generally believed to be in excess of productive worth.

To conclude, the examination of purchase declines has shown that:

- (a) the reasons for funds declines are arbitrary and discriminatory. Some allocative criteria are however necessary, given overall funds limits;
- (b) non-funds reasons for declines are consistent with Corporation goals. The number of applicants for uneconomic farms was highlighted.

On (ii) - Non-Purchase Declines: A 10% random sample was made of the 721 non-purchase declines made during the financial year 1970/1.

Prospective borrowers are informed in writing of the reasons for their loan decline. A proportion were declined as a result of funds limitations, but major reasons were on the grounds of prospective debt level, in relation to anticipated performance. (Table 13.10).

Table 13.10

Stated Reasons for Non-Purchase Loan Declines
(1970/1)
 (Sample Size - 72)

Heavy borrowing/inability of property to service debt	71.4
Excessive price (in restructuring cases)	28.6
Uneconomic Unit (physical production low)	24.5
Funds Shortage	20.4
Limited Security	18.4
Other	44.9

There was some divergence between the real reasons for loan decline and reported reasons above. Detailed examination was therefore made of field officers' file comments and reports. An analysis of the "real" reasons for loan decline indicated that "funds" shortage was not a factor (Table 13.11). The conclusion was that no application for non-purchase finance was rejected solely because of funds limitations. The reported reason of "funds" shortage was adopted in cases of delicacy, such as an adverse personal report.

The personal ability of the applicant was an important funds rationing device. Reports showed that a number of otherwise satisfactory propositions were declined on the grounds of limited farming ability, personal integrity, and to a minor extent farming experience.

Table 13.11

Analysis of the "Real" Reasons for Non-Purchase
Loan Declines During 1970/1
 (% Sample Size - 72)

Personal factor	51.0
Contingencies after borrowing	36.7
Uneconomic Unit	30.6
Isolated/unattractive site	30.6
Unsatisfactory security	14.3
Other	34.7

The personal factor rationing device is consistent with the Corporation's farm income maximisation goal (13.2). A proportion of applications for finance were declined on the

grounds of limited property potential. An analysis (Table 13.12) has been made of some farm parameters where loans were declined on the grounds of uneconomic size. The need has been mentioned above for research on the motivations of farmers who are prepared to remain in the farm sector and earn an estimated net income, after borrowing, of \$1,445. These declines on the grounds of economic viability are consistent with the Corporation's goals.

Table 13.12

Selected Mean Parameters of Properties
with Loan Declines

<u>Parameter</u>	<u>"Economic"</u>	<u>"Uneconomic"</u>
Estimated gross income (\$)	17,531	7,166
Estimated farm costs (\$) (Incl. tax)	8,383	3,725
Estimated annual charges (\$)	4,564	1,996
Estimated net income (\$) (after deduction of all charges)	4,584	1,445
Current Equity (\$)	42,925	31,367
No. of units	50	22

A number of loans (14.3% of declines) were declined on the grounds of lack of security, but this was generally only a secondary factor. The security factor was not of major import as an allocative device.

The conclusions from the study of non-purchase declines were that:

- (i) there were no observed cases of non-purchase demands for finance being declined that were inconsistent with Corporation goals;

- (ii) the role of the personal factor emerged as a major allocative device. This has not received great attention in farm credit literature.

13.17 Ex-Post Resource Allocation

In an attempt to assess the extent of ex-post resource misallocation, an examination was made of cases of suspensions of principal and interest payments. "Suspensions" represent the result of actions taken on repayment "arrears", and the two concepts are dis-similar.

The basic source of data was a "Farm Profitability Investigation" undertaken by the Corporation in February 1971 for the Agricultural Production Council. Data generated was not utilised and has remained unpublished. During the course of this investigation details were collected of suspensions:

- (i) of more than \$500 during the financial years 1969/70 and/or 1970/1; and/or
- (ii) that had accrued to more than \$500 during the financial years 1969/70 or 1970/1.

With the exception of Napier Branch that did not supply relevant data, 737 cases were reported and these represented 1.98% of rural accounts. Analysis was made of these cases, with the further exception of Hamilton Branch

data, since a "sample" rather than the "population" of cases was submitted by that Branch. In the final event 540 cases were analysed, covering all areas of New Zealand with the exceptions of the Napier-Hastings region, and the immediate Hamilton vicinity.

A contingency table was drawn (Table 13.13), classifying these cases according to:

- (i) their status as "economic" or "uneconomic" units, as assessed by field officers;
- (ii) the causes of suspension - either short term (as a result of the variance in farm business conditions), or long-term (as a result of structural factors);

Table 13.13

Relationship Between Causes of Suspension and Unit Type
(540 Units)

	<u>Short Term Causes</u>	<u>Long Term Causes</u>	<u>N/A</u>	<u>Total</u>
Economic Unit	29.1	31.1	0.2	60.2
Uneconomic Unit	1.7	31.9	0	33.6
N/A	0	6.1	0	6.1
Total	30.8	69.1	0.2	100.1*

* Rounding error only.

From this table it can be seen that:

- (i) long term factors were the major causes of suspensions on uneconomic properties;

- (ii) one-third of properties with debt repayment suspensions were considered to be uneconomic.

Examination was made of each of the three major dependent elements from Table 13.13. The modal short-term cause of repayment suspension on economic properties was the effect of drought (Table 13.14), and this observation was regionalised. In some areas drought is a short-term business hazard, and suspension for this reason does not in itself suggest resource misallocation.

Table 13.14

Short Term Causes (Economic Farms) of Repayment
Suspension
 (% of Sample-157)

Drought	58.0
Excessive short-term liabilities	24.8
Adverse season	8.3
First year on property	5.7
Other	5.1

The modal long-term factor influencing repayment suspension on economic properties was the Corporation's development lending policy itself (Table 13.15). Policy is to regularly grant suspension of principal for the first few years where development is taking place. The effect of financial mismanagement (for example, high short-term indebtedness or heavy personal expenditure) was also a factor inducing suspension. One branch made the comment that:

"... thinking farmers do not appear to get into serious financial difficulties..."

Table 13.15

Long Term Causes (Economic Farms) of
Repayment Suspension
 (% of Sample-168)

Development	41.1
Financial Mismanagement	39.3
Drought	6.0
Other	16.1

The role of the personal factor as a rationing device for new loans (13.15) has been discussed. These results show that financially incompetent farmers operating on economic units are granted loans. As a result resources may not be allocated in accordance with Corporation goals.

The causes of repayment suspensions on uneconomic properties were largely long-term and structural in nature. (Table 13.13). The lack of revenue and farming ability and/or integrity were the major determining factors (Table 13.16). The role of managerial ability was investigated further, and in 27% of all suspension cases management was considered to be "poor". In only 3% of all suspension cases was there a problem of a "good" management factor operating on an uneconomic unit.

Table 13.16

Long Term Causes (Uneconomic Farms) of
Repayment Suspension
 (% of Sample Size-172)

Revenue deficiency	41.9
Personal factor	33.7
Financial Mismanagement	25.0
Drought	7.6
Other	8.7

Two main policy implications arise from this investigation.

In particular:

- (i) there has been some misallocation of Corporation resources. Problems arise where poor management is placed in control of an "economic" business, and where good management is placed in control of an "uneconomic" business;
- (ii) the close relationship between uneconomic units and principal suspension suggests that in these cases resources need to be withdrawn from agriculture, rather than injected into it. Property sale may be a means of withdrawing at least labour resources from the farm sector, and this was recommended as the solution to financial problems in some cases (Table 13.17).

Table 13.17

Recommended Action Necessary to Solve Financial Problems of Farms Receiving Repayment Suspension

	<u>Economic Units</u>	<u>Uneconomic Units</u>
"Other" solutions	96.3	58.2
Sell property	3.7	31.1
Property sold (by Feb. 1971)	-	10.7
	100.0	100.0
Sample Size	(325)	(181)

The analysis has shown that whilst only a small proportion of accounts in recent years have received repayment suspensions, the reasons for suspension do suggest ex-post resource misallocation that is inconsistent with Corporation goals. A suggestion is that where suspension is a result of structural rather than business variance factors, the Corporation should assume a dynamic redistributive role (13.19).

13.18 The Efficiency of Corporation Rural Lending

A number of conduct factors have been identified that will adversely influence the efficiency of Corporation rural lending activities:

- (i) the need for information dissemination to fully identify the latent and new demand for farm finance (13.3);
- (ii) the market entry requirements, that stipulate the need for farm experience, and cash assets (13.5, 13.16);
- (iii) the need for more specialised staff training and for more background research (13.6);
- (iv) the need for more sophisticated loan evaluation techniques (13.7);

- (v) the "locking in" policy that may adversely influence intra-sector resource distribution (13.8).

The Corporation's average pricing policy was observed to be inflexible (13.12), and the application fee pricing system was inefficient, in economic terms (13.12). As a result of the average pricing policy, with interest rates at below market rates:

- (i) there is a positive interest rate subsidy effect that is discriminatory against non-Corporation mortgagors (13.12);
- (ii) non-pricing allocative methods have been developed.

The results of these non-pricing allocative methods that were essentially influenced by overall funds limitations were examined in detail (13.14 - 13.17). The four allocation studies showed that:

- (i) positive returns accrued from Corporation lending, particularly for development purposes (13.14), which had the effects of increasing production without significant increases in debt levels per productive unit. Intra-sector returns were not compared, and the results are therefore partial only;

- (ii) despite given funds limits, purchase and refinance loanable funds were not observed to be allocated according to the "first come-first served" principle (13.15). There was some evidence that development and restructuring applications were rationed in this way, given aggregate funds limits;
- (iii) loan declines were made primarily on economic rather than funds grounds (13.16). There was no evidence of any fringe of unsatisfied borrowers, and funds were provided for sound propositions with a good personal factor;
- (iv) ex-post resource misallocation was low (13.11, 13.17) and the personal factor emerged as the predominant contributory cause.

Non-price rationing factors were therefore essentially economic in concept (e.g. personal ability, project viability), though funds rationing devices (e.g. loan limits, security) were a secondary supplement (13.5). Whilst there was no evidence of resource misallocation as a result of these funds rationing devices, efficiency would not be impaired and may be improved if the price mechanism were allowed to assume a greater allocative role. Such use would necessitate some relaxation of security and limit requirements and the Finance Committee of the Agricultural Production Council has recommended in April 1971 that:

"... The State Advances Corporation examine the possibility of introducing some flexibility in loan limits...".

Increasing use of the pricing mechanism would thus:

- (i) reduce any arbitrary effect of present funds rationing devices, even though these were not observed to be reasons for loan decline (13.16);
- (ii) enable the Corporation to evaluate riskier loans according to marginal principles given its goal structure;
- (iii) enable the Corporation to play a more dynamic role in the farm credit market.

13.19 The Corporation's Future Role

Corporation staff believe that close Government surveillance has created a cautious atmosphere. For example, profits are paid into the Public Account (13.1) and therefore economic incentive for internal efficiency is restricted. Treasury vetoes on the ability of the Corporation to raise stock (13.9) have restricted its lending ability to that predetermined by Government.

The Corporation is in essence a rural bank, providing all but seasonal finance to the farm sector. Given a similar role to that of the Public Corporation in the United Kingdom, the Corporation would have greater autonomy and responsibility for its actions. In this way its activities might be extended to include farm service financing, farm mortgage discounting and the operation of a farm mortgage market (see 17.3). Its structural role might be extended to include the redistribution of assets within the farm sector. For instance, the Corporation might be empowered to purchase uneconomic units and actively encourage the strengthening of inefficient units. Corporation activities might also be extended into the land ownership field. The whole concept of land ownership is receiving attention in the literature, and a recent O.E.C.D. report anticipates increasing ownership of farm land by State bodies. This development

"... would enable farmers to farm without necessarily owning land... and would therefore remove obstacles placed on farm expenditure because of real estate purchase...".⁵

The concept of land ownership is more fully discussed elsewhere (Ch. 18). However, as a State body the Corporation might be able to "place" trained young farmers on units without the present entry requirements, and facilitate a natural progression through promotion and demotion in the farm sector. Such an allocative function would be consistent with present

Corporation goals.

On the basis of past performance the Corporation has been shown to be a largely efficient organisation in rural lending but a more dynamic and extensive structural, allocative and distributive role is hypothesised.

CHAPTER FOURTEEN:

Supply of FundsA Summary14.1 Introduction

The aim of Section Three was to describe the factors influencing the flow and distribution of funds to the farm sector from selected institutions and to qualitatively assess the efficiency of this distribution. The analysis was partial in nature and did not specifically purport to determine whether funds in aggregate should or should not be allocated to the farm sector. A macro resource allocation investigation in the full economic system would require numerous and detailed additional data, and collection of this was beyond the scope of the study. Rather, this study has been concerned with the efficiency of the mechanism with which funds are distributed to the farm sector.

Three institutions supplying funds to the farm sector were examined in depth and their market role defined. It must be noted that these institutions accounted for only about 40% of the stock of external funds committed to the farm sector at June 1970 (20.1), and general conclusions must be drawn from these analyses with caution.

The analytical framework was that of the "market" (Ch.10). In all three studies the observed market structure was at variance with the perfect system (10.3). In the cases of trading banks and

stock firms this has facilitated particularly effective use of cartel pricing. Other structural features were described that distort the efficiency of loanable funds distribution, but emphasis was placed on the operations of the price mechanism in funds allocation.

14.2 Use of the Price Mechanism

The essence of efficient market resource allocation is that of an unimpeded operation of the price mechanism which would account for risk, and a preference for yield or risk aversion (e.g. Lindners' formula, 10.6). This mechanism assumes an equality of marginal assessment by both borrower and lender, and this equality in the full system would maximise both institutional and national income. It has not been proven in the literature, or this thesis, that farmers do operate at the margin in their investment decisions. There is likely to be some divergence of opinion of the marginal assessment between borrower and lender. This in itself will preclude effective attainment of a static or dynamic equilibrium, and may be considered a basic factor that limits the role of the price mechanism.

The community's attitude towards the rate of interest is however the major factor that has diminished the role of the price mechanism as an allocative device. The determinants of this attitude are not discussed, but may be a function of New Zealand's attempts at insulation from the mainstream of world monetary activity. The effect in the farm credit market of this attitude is revealed

within each sub-market in a slightly different way:

- (i) by strict controls over the trading bank's average rate of interest (11.17) at below the equilibrium rate, the market is not cleared, and banks are forced to utilise deposits as a rationing device;
- (ii) the reluctance of stock firms to vary their interest rate on lending to farmers, and their reliance on average rather than marginal pricing techniques. They are also faced with a psychological barrier (10% rate of interest) that would necessitate their registration as finance companies (12.15)¹;
- (iii) the reluctance of government to follow market trends in the rate of interest charged on its loanable funds (Fig. 13.2), with the effect that a discriminatory interest rate subsidy is created (Table 13.6).

As a result of these phenomena, risk is not accounted for fully in pricing. In the case of trading banks, "risky" projects

¹ The origin of the "barrier" can be related to the "farmer service" image of stock firms as represented by their public relations media (12.5). Stock firms do not wish to appear as usurers of the farm community.

are not considered, and first-class security may be taken as given (11.5). Apart from the preservation of an ineffective "risk" pricing anachronism, through the Reserve Fund Contribution (13.12), the State Advances Corporation does not fully reflect "risk" in its average pricing policy. In all sub-markets risk is reflected by the decline of a proposition.

14.3 The Role of Government

Government activity has also contributed in large part to this limited use of the price mechanism as the funds allocative device, and to allocation patterns in general.

The detailed operation of the tier system of monetary control coupled with interest rate constraint, has meant that trading banks look to deposit funds as the basis of loanable funds allocation (11.8). The system has also precluded from the banks the onus of making aggregate allocation decisions. The tier system and interest rate controls are inconsistent in object. Whilst the tier system is designed to channel funds into the farm sector, the sector is decreasingly attractive to banks as a result of a secular decline in its deposits (Appendix E). From discussion (11.8), the conclusion was reached that the tier system was hardly conducive to efficient inter-sector resource allocation. Since the time of the study, there have been some attempts to modify this system and:

" ... discussions are going on to devise a more competitive and unified system of ensuring that changes in trading bank advances and deposits are appropriate to circumstances at any particular time ..." ²

No firm measures have yet been taken, and deposits remain the prime bank allocative device under the existing environment.

The full extent of Government activity in the farm credit market was evident in the State Advances Corporation study. Throughout the conduct of this study a lack of identity was apparent as the Corporation pursued its schizophrenic "economic-welfare" dual role. The Corporation's inter-sector funds allocation pattern is pre-determined (Table 13.1) through Government policy and the effect of the "locking-in" policy (13.8). Aggregate funds limits for farm purchase and refinance are also pre-determined by Government and the explanation of these allocations is the task of the political scientist rather than the economist. Given these pre-determined funds allocations, both to and within the farm sector, the efficiency of funds distribution can be examined through detailed loan performance studies (13.14) and regular re-appraisal of the "first come - first served" thesis (13.15). With the increasing quality and quantity of data emerging from the Corporation, following the

² Reserve Bank of New Zealand Bulletin, XXXIV, No.9 (October 1971), p.232

foundation of a Research Section, the technique described to assess the "first come - first served" thesis (13.15) could become an increasingly sophisticated evaluation procedure, for instance through use of correlation measures.

14.4 Stock Firms

Stock firms have not been subject to such direct government controls as illustrated above. The historical development of farm supplier turned quasi-banker has had the result that "business generated" is the fundamental funds allocative device. The net worth concept (12.17) was developed to provide a formal allocative evaluation procedure, given limited use of the price mechanism in loanable funds allocation (Table 12.8), against which actual performance could be compared. In practice the effect of tradition, past customer loyalty (12.18) and the branch/Head Office goal dichotomy (12.6) has meant that the technique provides only the broad guideline for funds allocation in the individual case. These circumstances have led to stock firms too, operating in a schizophrenic type environment. Their desire to exploit opportunities generated by a diversifying economy was observed to be hampered by an identifiable adherence to a "folksy farm sector traditionalism". This was believed to be particularly evident at branch level and has had the effect of "locking-in" funds to the farm sector (12.17), as well as thwarting attempts to allocate resources in a more sophisticated manner.

14.5 Conclusions

Limited use of the price mechanism has led to alternative methods of farm sector funds allocation being developed. These methods have been described in detail (Chapters 11-13), and have developed partially as a result of New Zealand's financial institutional structure, and partially as a result of the ex-post role of agriculture as the predominant sector in the economy. Non-price rationing devices have meant, from the institutional viewpoint, that the farm sector is likely to be receiving more funds than if the price mechanism operated in a less restricted manner. The effect of Government activity (particularly on the institutional environment (14.3)) has been critical, and has ensured that funds are channelled into the farm sector. Government activity, by ensuring availability, must help to explain the Credit Survey conclusion that farmers themselves, in 1970, did not believe there to be a shortage of funds (9.9). Within the farm sector, detailed administration of funds allocation in the individual case (e.g. trading bank security requirements (11.4), stock firm concern with ex-post loyalty), has meant that, ceteris paribus, the ability of the older farmer to borrow is greater than that of the younger farmer. One effect of limited adherence to the price mechanism has been a pre-occupation by institutions with ex-post measures of assessment (e.g. loyalty) rather than ex-ante project assessment measures. No institution examined for instance, utilised any sophisticated measure of loan

evaluation. In this way any discrepancy between perceived institutional and real optimisation of national resource allocation may be widened.

Two final observations therefore emerge:

- (i) the aggregate supply of funds to the farm sector, by the trading banks and State Advances Corporation particularly, has been encouraged by Government;
- (ii) given (i) above, detailed administration and allocation of funds in the individual case has been based on non-price devices, and carried out within the confines of an imperfect market structure. The inefficiencies resulting have been highlighted (11.20, 12.18, 13.18).

AN EXPLORATORY INVESTIGATION INTO THE
FARM CREDIT MARKET IN NEW ZEALAND

by

R.J. STANBRIDGE

being a thesis submitted for the degree of
Doctor of Philosophy in Economics at the
Victoria University of Wellington

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V O L U M E I I

(PART FOUR AND APPENDICES)

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PART FOUR

CHAPTER FIFTEEN: Some Implications of the
 Supply/Demand Investigation

15.1 General Observations

The aims of this thesis have been:

- (i) to describe the factors and problems affecting the use of external funds by the farm sector (Part Two);
- (ii) to describe and assess qualitatively the efficiency of loanable funds distribution to the sector from three institutional sources (Part Three). The theoretical bases of investigation have been the "firm" and the "market" respectively.

The approach to the study has been at the primary data level and apart from Part One, has generated new data rather than relied on the use of secondary data. This approach has had three results. Firstly, as is common with most research projects, more questions remain unanswered than were answered. Secondly, the study's concern with the decision making of the

individual borrower and lender has meant that non-economic factors were offered in explanation of some phenomena. Thirdly, the approach adopted has suffered from the obvious omission of an assessment of the economic efficiency of the inter-sectoral distribution of resources (14.1).

To rectify this omission would require a considerable volume of inter-sectoral productivity data, and the use of optimisation procedures. The use of these procedures, with their assumption of neutral behavioural reaction, would be likely to lead to some discrepancies from conclusions drawn from this study (Chapters 9, 14). Real optimisation as assessed by the econometrician is likely to be at variance with perceived optimisation, as assessed in the behavioural interpretation of the full economic system. For example, a failure to undertake profitable investment in the farm sector (requiring a flow of resources to that sector) may under the economic behavioural approach adopted in this study be accounted for by the effect of the farm firm life cycle, with its changing relevance of the growth and ownership goals (9.2, 9.3). A real economic system is only as efficient as its participants, and this study has attempted to account for deviations in the economic efficiency of its participants. Nevertheless, the compromise in approach between a true economic and a behavioural approach has been a continual problem throughout the duration of the investigation. As fieldwork progressed, three equilibrium concepts became apparent. These concepts were not necessarily

reconcilable, as they would be in the Paretian system.

The concepts were:

- (i) real equilibrium in the product market
i.e. the econometrician's optimal state of
resource allocation, as described in 10.3;
- (ii) perceived equilibrium of the financial
institutions i.e. their optimal allocation
of resources within the institutional
environment;
- (iii) perceived equilibrium of the farm sector
i.e. a state of zero credit gap.

These concepts do provide the basis for further avenues of research in the farm credit field. Some topics that have emerged during the course of investigation have raised the question of the various equilibrium imbalances and are therefore discussed further in Part Four (Chapters 16-19). An introduction to these topics and their relevance to previous results and the three equilibria concepts is made below (15.2).

15.2 Implications of the Investigation

The conclusions were reached that:

- (i) farmers considered that they were obtaining the funds they required to operate their businesses in accordance with their goal structures (9.9);
- (ii) despite observed inefficiencies (11.20, 12.18, 13.18) supply factors were generally operating to facilitate this state (14.5).

The result of research, particularly amongst trading banks and stock firms, was that institutional factors operated to ensure that more funds were allocated to the farm sector than would be under a state of perceived institutional equilibrium.

The zero credit gap conclusion (9.9), was made within the auspices of the farm firm life cycle. The suggestion that satisfaction with the status quo and ownership of the farm business are important factors inhibiting borrowing (4.9), has important effects. This is particularly if real equilibrium would demand an increase in farm production through injection of additional resources into the sector. The conflict here between a real and a farm sector perceived equilibrium is most apparent. Age of operator was shown to be an important variable in determining the propensity to borrow throughout the Part Two analysis, and the effect of this variable as the basis of the life cycle demands further discussion. The comments that the life cycle and age structure of the farm population are important phenomena to be assessed by the policy maker are made

in Chapter 16. Some simple examples are presented illustrating the effects on farm sub-sectors, defined according to age group of operator, of various policies, as well as an indication of the likely direction of effects of a changing age structure. Some policies are suggested to manipulate the growth/ownership relationship of the life cycle given that farm production increases are a desirable goal, and the chapter concludes with a brief theoretical discussion of the elasticity of demand for funds, based on the "age" variable.

An incompatibility between real and perceived institutional equilibrium is discussed in theory in Chapter 17, and a "second best" solution to farm sector resource allocation is presented, given that reconciliation is not possible. The chapter, concerned with resource allocation to the farm sector, also suggests the development of a mortgage market, supervised by the State Advances Corporation, in order to facilitate a possibly smoother flow of funds to the sector.

The desire for farm ownership (with the consequent observation of internal rationing in field investigation (Chapter 8)) was critical as an explanation of borrowing behaviour (9.2). Though evidence is not presented in this study, there is a belief by many lenders that lending for farm purchase is (for various reasons) not an attractive proposition, and a belief by others that institutions are not prepared to make funds available for

this purpose¹.

A simple economic model incorporating the farm purchase concept is developed in Chapter 18, and the general concepts of farm ownership, under present and alternative systems of land tenure, are briefly discussed. Discussion is not intended to be comprehensive, but rather a series of observations that need to be made in the light of the importance of farm ownership to observed behaviour in Section Two.

Limited use of the price mechanism in funds rationing has been observed (14.2), and the rate of interest has therefore not fulfilled its theoretical allocative role. The farm credit market's attitude to the function of the rate of interest is discussed in Chapter 19. The concept of concessionary farm sector interest rates, a policy goal in New Zealand (11.17), is examined with the help of a simple model. This is in the light of a possible divergence between real and perceived institutional equilibrium. The chapter also considers the likelihood of increasing use of the rate of interest as an allocative device.

¹ General impressions arising from detailed study of the submissions to the Committee of Inquiry into Lending to Farmers, Wellington, September-November 1971, and author's co-opted membership of the Finance Sub-Committee of the Agricultural Production Council. A shortage of funds for farm purchase was not apparent from the 1970 Survey, but this was confined to operators who had attained sector entry (4.7).

15.3 Conclusions

Part Four is therefore a series of observations on what may be logically directly unrelated concepts, but concepts that have been prominent during the course of field research and that require further comment. The four concepts are not discussed in detail and it is recognised that each offers a very fruitful field of investigation, either from a strictly economic viewpoint, or from the hybrid economic-behavioural approach adopted in this thesis. Suggestions for future research on topics that are not discussed, or that are not rigorously analysed in Part Four, are made in Chapter 20.

CHAPTER SIXTEENImplications of the
Life Cycle16.1 Introduction

This chapter defines the farm sector as consisting of a number of sub-sectors. These sub-sectors are based on age groups of operators. Some differential effects of policies on these sub-sectors are discussed in the light of the principal hypothesis of the life cycle thesis. This is that the ownership and growth goals assume a changing importance to the farm operator over time. The effects of changes in the age structure of operators in the farm sector are considered (16.3). The chapter concludes with a brief mention of an elasticity concept, based on age of operator (16.4).

16.2 Implications of the Life Cycle

Mean farm structural parameters may be defined according to the age class group of operator (Table 16.1).

Table 16.1

Mean Farm Sector Structural Parameters
Per Business
(time t)

	<u>Proportion</u>	<u>Farm Assets</u>	<u>Borrowing</u>	<u>Output</u>	<u>Indebted- ness</u>
Sector i	P_i	A_i	B_i	O_i	$b_i = B_i/A_i$
Other sectors	$(1-P_i)$	$\frac{\bar{A}-P_i \cdot A_i}{1-P_i}$	$\frac{\bar{B}-P_i \cdot B_i}{1-P_i}$	$\frac{\bar{O}-P_i \cdot O_i}{1-P_i}$	$\frac{\bar{b}-P_i \cdot b_i}{1-P_i}$
Farm population		\bar{A}	\bar{B}	\bar{O}	\bar{b}

where Sector i ; farm operators within i-th age group

A_i ; mean total farm productive assets per business unit,

B_i ; mean total borrowing per unit, sector i sector i

O_i ; mean total output per unit, sector i

B_i/A_i ; indebtedness proportion

\bar{A} , \bar{B} , \bar{O} , \bar{b}_i ; population mean parameters.

In a constant price environment and assuming that borrowing has an asset creation effect, an increase in borrowing by ΔB_i per unit in sector i , will have effects on mean sectoral and total farm assets, borrowing and output (Table 16.2).

Table 16.2

Effect on Mean Parameter Values of an Increase
in Borrowing by ΔB_i per Farm Unit, Sector i
 (No Time Lags in Adjustment)

	<u>Farm Assets</u>	<u>Borrowing</u>	<u>Output</u>	<u>Indebtedness</u>
Sector i	$(A_i + \Delta A_i)$	$(B_i + \Delta B_i)$	$(O_i + \Delta O_i)$	$\frac{B_i + \Delta B_i}{A_i + \Delta A_i}$
Farm popula- tion (Mean)	$\bar{A} + p_i \cdot \Delta A_i$	$\bar{B} + p_i \cdot \Delta B_i$	$\bar{O} + p_i \cdot \Delta O_i$	$\bar{b} + p_i \cdot \left\{ \frac{B_i + \Delta B_i}{A_i + \Delta A_i} - \frac{B_i}{A_i} \right\}$

The increase in borrowing may be deemed to have a mean output increasing effect per unit, sector i , of

$$\Delta O_i = \Delta B_i \cdot \frac{O_i}{A_i} \quad - (1)$$

where O_i/A_i is the inverse of the average capital-output ratio, sector i , and the average capital-output ratio is assumed to be

equivalent to the incremental capital-output ratio. This is based on the simplifying premises that there is a constant state that of technology and/the classical law of diminishing marginal returns does not operate.

Equation (1) above is based on a number of conventional assumptions and these are stated:-

- (i) A "whole farm assets" concept of capital is implied. Land and on-farm capital are necessary together, in some proportion, to produce a level of output;
- (ii) output and assets concepts are defined in real terms;
- (iii) firms can borrow without limit restrictions and capital is divisible i.e. production and input boundaries are fluid;
- (iv) firms operate at the intensive limit of production.

The additional assumption is made that output increases are attributable solely to increases in borrowing.

From Table 16.2 above, the increase in borrowing by ΔB_i per unit in sector i will have the following effects (Table 16.3):

- (i) an increase in aggregate-percentage-farm-population output will depend on the proportion of farmers within sector i, and that sector's capital-output ratio;

- (ii) the aggregate percentage increase in indebtedness, over all farms, will depend on the increase in borrowing ΔB_i and the proportion of farmers in sector i;
- (iii) the aggregate increase in indebtedness will depend on all asset/borrowing parameters in sector i and changes.

Table 16.3

Mean Percentage Effects in Sector i and in Aggregate of a Changing ΔB_i

	<u>Assets</u>	<u>Borrowing</u>	<u>Output</u>	<u>Indebtedness</u>
Sector i	$\Delta A_i/A_i$	$\Delta B_i/B_i$	$\Delta B_i(O_i/A_i)/O_i$	$\left\{ \frac{B_i + \Delta B_i - B_i}{A_i + \Delta A_i} \right\} / \frac{B_i}{A_i} \cdot b_i$
Farm population (Mean)	$p_i \cdot \Delta A_i / \bar{A}$	$p_i \cdot \Delta B_i / \bar{B}$	$p_i \cdot (\Delta B_i \cdot \bar{O}_i) / \bar{O}$	$p_i \cdot \left\{ \frac{\Delta B_i \cdot A_i - \Delta A_i \cdot B_i}{\bar{b} \cdot A_i / (A_i + \Delta A_i)} \right\}$

Policy makers in New Zealand frequently refer to aggregate production, debt and indebtedness changes over all farms. Little attention is generally paid to the within sector effects of overall changes. To roughly assess the likely magnitude and direction of changes in borrowing both within a sector and in aggregate on output and asset accumulation, some basic structural data was extracted from Table 3.7 (Table 16.4). It is assumed that the above capital-output assumptions are relevant and that intra-sector parameter variance is zero. For a full analysis a far more accurate assessment of farm sector incremental capital-output ratios would be required.

Table 16.4

Farm Sector Structural Data
(to nearest \$000)

Age Group	p_i	A	B	O	b	A/O (K/O Ratio)
21-30	.08	73	31	14	0.42	5.2
31-40	.25	93	32	16	0.34	5.8
41-50	.31	96	29	19	0.30	5.1
51-60	.25	82	18	17	0.22	4.8
61-	<u>.11</u>	71	6	11	0.09	6.4
Farm Population	<u>1.00</u>	87	25	16	0.28	5.3

The effect of an increase in borrowing of \$10,000 on each unit within each sector taken separately has variable effects as reflected by mean farm population parameters (Table 16.5). The calculations have been based on the formulae from Table 16.3 above, and the additional assumption made that $\Delta B_i = \Delta A_i$.

Table 16.5

Percentage Increase in Mean Parameters Resulting from a
\$10,000 Increase in Borrowing on Each Unit Within Each Sector

Age Group	$\Delta O/O$	$\Delta A/A$	$\Delta B/B$	$\Delta b/b$
In Sector 1 (21-30)	13.7	13.7	32.3	16.7
In Farm Population	0.9	0.9	3.2	2.0
		(sum borrowed - \$3.6m)*		
In Sector 2 (31-40)	10.8	10.8	31.3	20.6
In Farm Population	2.6	2.9	10.1	6.3
		(sum borrowed - \$11.3m)*		
In Sector 3 (41-50)	10.3	10.4	34.5	23.3
In Farm Population	3.7	3.6	12.5	7.8
		(sum borrowed - \$14.0m)*		
In Sector 4 (51-60)	12.3	12.2	55.6	36.4
In Farm Population	2.9	2.9	10.2	7.1
		(sum borrowed - \$11.3m)*		
In Sector 5 (61-)	14.2	14.1	166.6	122.2
In Farm Population	1.0	1.3	4.5	4.3
		(sum borrowed - \$5.0m)*		

* represents an estimate of dollar borrowing within sector.

The results above (Table 16.5) are based on the Survey data (Table 16.4) and on the assumption of 45,000 full time farmers in New Zealand¹. Since a simple random process was used to select the sample (Appendix B), then the sample distribution represents the expected value of the population distribution.

The output increase effect in each sub-sector of the \$10,000 per unit injection is dependent on that sector's incremental capital-output ratio. From the crude empirical data (Table 16.4) this ratio showed some variance between sectors. This is reasonable as a result of external influences on the use and on the efficiency of use of capital. *Ceteris paribus*, younger farmers are likely to have a greater labour input than older farmers but a more limited managerial input. The increase in total output is also a function of the proportion of total farm operators within each sub-sector.

From Table 16.5, the effect of equivalent dollar borrowing per unit is shown to vary from sub-sector to sub-sector. In particular:

- (i) the proportionate increase in mean assets per unit was greater in sectors one and five than in other sectors. This was as a result of lower base levels. As a result of capital restrictions younger operators were more likely to have commenced farming on smaller units. Older farmers were

¹ Agricultural Production Council (168) p.91.

also observed to be farming on small units. In a number of cases this was a result of the parcelling off of land to avoid death duties. The effect of such borrowing on the whole farm sector was low;

- (ii) percentage increases in borrowing were observed to increase with sector age group, and equivalent borrowing sums have variable sector effects. The average aggregate rate of increase in borrowing was related to the p_i factor;
- (iii) similar patterns to (ii) above were observed for increases in indebtedness.

An alternative approach to investigate production and indebtedness effects within each sector is to assess the requirements and performance needed of each sector taken separately, given that a policy aim is to increase aggregate production by a certain percentage, say 5%. Given the structural relationships above (Table 16.4) this aim could be achieved by each sector alone with the following changes (Table 16.6).

Table 16.6

The Sectoral Effect Per Business Unit
of an Increase in Total Output by 5%

	$\Delta O/O \approx \Delta A/A$	$\Delta B/B$	$\Delta b/b$
Sector 1	74	173	47
Sector 2	21	60	34
Sector 3	14	53	33
Sector 4	19	43	29
Sector 5	68	800	404

These observed variations have implications for any sectoral injection of loanable funds to achieve aggregate production increases:

- (i) for a 5% increase in production in aggregate, combined with the lowest rate of increase in production per unit (i.e. most likely to be within capabilities of operator), there is a need to inject funds into sector three. This is the largest proportional sector;
- (ii) for the smallest rate of increase in indebtedness per unit, funds need to be injected into sector four i.e. in that sector stimulate the growth goal at the expense of the ownership goal;
- (iii) for a 5% aggregate increase in production, sectors one and five would have limited potential as a result of large increases in average debt and indebtedness per unit that would be required. In sector five such increases would be highly unlikely, given that the goal structure can be varied only marginally.

The policy implication is that if agricultural production increases are deemed to be desirable (and this is a major policy aim in New Zealand) then there is a need to stimulate borrowing in farm sub-sectors where the incremental capital-output ratio is lowest, where individual units can stand increases in indebtedness,

and where production increases per unit would be feasible. From the above discussion, these conditions are met by the middle-aged operator. The policy requirement is therefore to attempt to manipulate the goal structure of middle aged operators by emphasising the growth as opposed to the ownership goal.

(a) encouraging the growth goal

through,

- (i) granting excess tax exemptions on interest payments for on-farm borrowing. This would have the effect of reducing individual tax bills by:

$$\Delta T = t.r.i$$

so that $\Delta T/T = - r.i/(R - C)$

and T = tax bill (original) t = constant tax rate,
 r = excess payment allowed (e.g. double exemption),
 i = interest payment, $(R - C)$ = previous taxable income.
 The larger the proportion of interest to total taxable income, the larger the proportional effect of tax reduction;

- (ii) granting an interest rate subsidy or tax exemption to non-Government lenders lending for productive purposes, of the difference between the concessional rate charged to agriculture and market rate. This would enable lenders to allocate at the margin more efficiently;

(iii) allowing debt repayment (for productive purposes) as an on-farm charge before tax;

(iv) offering incentive payments to attain output increases.

As a result of an obvious identification factor, *ceteris paribus* policy (iv) would be ^{more}/likely to lead to greater production increases, than manipulation of economic factor pricing.

(b) discouraging the ownership goal

through,

(i) increasing the rate of death duties on agricultural land, but providing provisions for earlier transfer of property;

(ii) introducing a capital gains tax on agricultural land, not producing at an assessed level of productivity;

(iii) disallowing the interest charged on monies borrowed for farm purchase to be offset against tax assessment.

Measures (b) are likely to be far less socially and politically acceptable than measures (a). Regardless of measures adopted this section has highlighted the necessity for selectivity in loanable funds allocation for productive purposes. This is as a result of the differential effects of allocating loanable funds to farmers according to age group.

16.3 The Effects of an Ageing or Increasingly Youthful Farm Population

From the parameters and assumptions of Table 16.4, if the farm population were to age (i.e. the turnover of farms were to slow down as prospective farm operators turned to alternative employment) so that there were no operators in the 21-30 age group, but an equivalent increase in the 61 and over age group, then the mean effects would be:

$$\Delta A/\bar{A} = -0.2\%; \quad \Delta B/\bar{B} = -9.5\%; \quad \Delta O/\bar{O} = -1.5\%$$

and $\Delta b/\bar{b} = -7.1\%$.

These have been measured on a comparative static basis, by assuming an instantaneous change in the age structure.

From Table 16.4 data, the comparative static effect of a decline in the age of the farm population, such that there were no farmers over 60, but an equivalent increase in the number in the 21-30 age group would be:

$$\Delta A/\bar{A} = 0.2\%; \quad \Delta B/\bar{B} = 9.4\%; \quad \Delta O/\bar{O} = 2.0\% \text{ and } \Delta b/\bar{b} = 11.7\%.$$

On the 45,000 full time farmers assumption (16.2), the above effects can be translated into million dollar magnitudes (Table 16.7).

Table 16.7

The Comparative Static Effects of an Ageing or an
Increasingly Youthful Farm Population
(\$ million)

	<u>A</u>	<u>B</u>	<u>C</u>
Situation (June 1970)	3,922	1,127	741
Ageing Population (as above)	3,915	1,018	730
Change	-7	-109	-11
Youthful Population (as above)	3,932	1,233	756
Change	+10	+106	+15

From the order and direction of these figures, implications are that:

- (i) an ageing farm population will have marginal effects on the volume of assets employed in agriculture and on output levels as defined in constant price terms (16.2). The volume of debt outstanding is likely to fall. This is as a result of the changing goal structure with the increasing relevance of ownership and financial strength;
- (ii) a declining age structure of farm operators has the effect of marginally increasing total assets employed in agriculture. When account is taken of the price factor, an increasingly youthful farm population is also likely to influence the price of farm assets, particularly land. This is a factor in inelastic supply, and a declining age structure would imply increasing demand. From this data a fall in the average age of farm operator has

marginal production effects, but a significant increase in indebtedness. This is as a result of market entry requirements, and the relevance of the growth rather than ownership goal in the early stages of the life cycle.

From the order of this limited data, the case for substantial assistance to enable young operators to enter the industry is not supported. This is as a result of:

- (i) marginal observed differences in the average capital-output ratio between sectors; the efficiency of labour input might be expected to be higher for younger farmers, but the managerial input may not be;
- (ii) increases in the volume of scarce new funds that would need to be allocated to enable market entry under present social conditions;
- (iii) limited production increase effects, as a result of (i) above.

On the other hand the farm population stock will need replenishing, and the problems of farm ownership and market entry are discussed (Chapter 18).

16.4 Elasticity of Demand For Funds

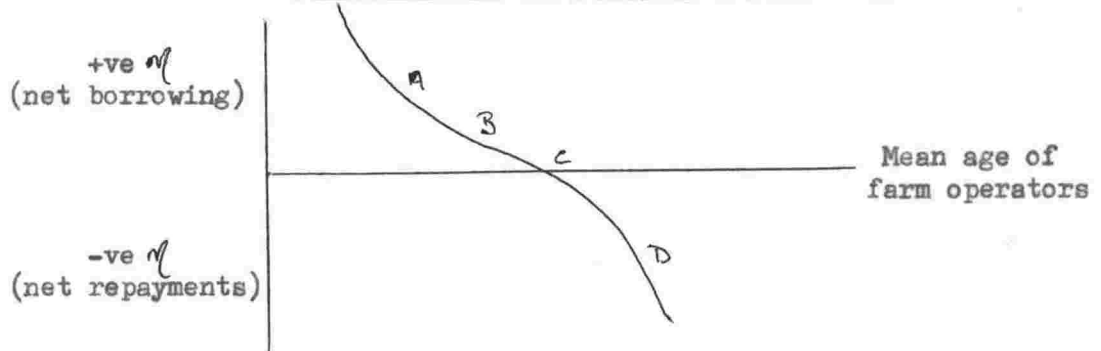
The elasticity of demand for funds is customarily related to monetary factors such as interest rates. The development of the life cycle thesis suggests that the elasticity concept can be related to the mean age of farm operators (Fig.16.1). The point elasticity measure, η , is given where:

$$\eta = \Delta F / F / \Delta A / A$$

and $\Delta F / F$ = marginal change in demand for external funds;

$\Delta A / A$ = marginal change in mean age of operators.

Fig.16.1. Changes in the Elasticity of Demand for External Funds with Respect to Mean Age of Farm Operators

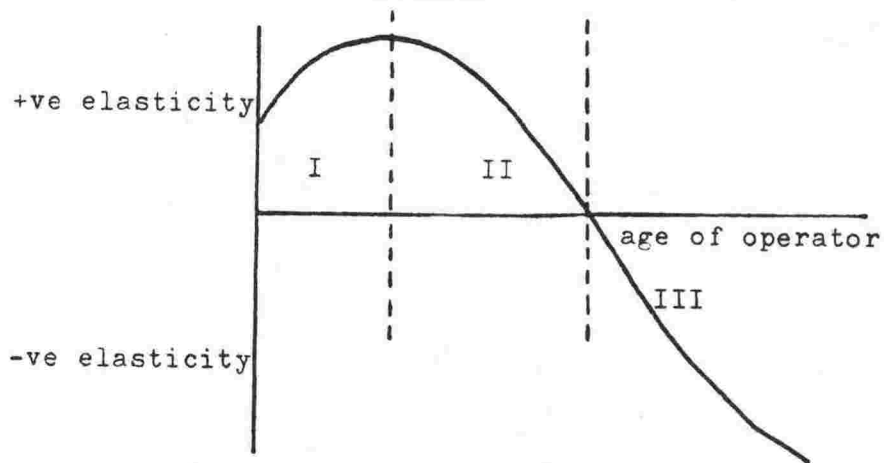


The logic of Figure 16.1 is that if the farm sector were to age, the collective willingness to borrow (reflected by the point elasticity measure) would decrease. At point B the mean age of operators is greater than at point A, and the point elasticity measure is lower. Thus there is a decreasing (though still positive) willingness to borrow if the mean age of operators were to increase from A to B. This is as a result of the changing emphasis of the growth and ownership goals. If mean age were at point C, the point elasticity measure is zero. This would imply a balance between sector net borrowings and repayments. Similarly, if mean age of operators were at point D, there would be a negative point elasticity measure. If the mean age of operators was at point D, the interpretation of the elasticity measure would be that the ownership goal is predominant, i.e. net debt repayments from the sector.

Changes in the elasticity of demand with respect to

the age of individual operator can be similarly plotted, and three life cycle stages are shown (Fig. 16.2).

Fig. 16.2 Changes in the Elasticity of Demand
for Funds with Respect to Age of
Operator



These may be defined:

- (I) formative: where there is a positive and accelerating demand for funds with respect to age of operator;
- (II) sustained: where there is still a positive elasticity, but this is declining (i.e. the ownership goal is assuming increasing import relative to the growth goal);
- (III) degenerative: where there is a negative elasticity of demand for funds with respect to age of operator.

The locus of the elasticity may be envisaged as having a heteroscedastic variance, which will decrease with age of operator.

The nature of this variance distribution will result from:

- (i) the longer ex-ante life cycle of the younger operator, with a greater awareness of possible projects;
- (ii) variation in the capacity of younger operators to borrow, given institutional constraints;
- (iii) a larger variation in ex-ante expectation in earlier stages of the life cycle.

It is suggested that a greater awareness by policy making authorities of the above theoretical funds elasticity structure will lead to a greater appreciation of the need for selectivity i.e. increases in production are most likely to be achieved by middle aged operators, where the goal dichotomy is most easily influenced, and where the elasticity of demand for funds is still positive. An "across the board" attempt to stimulate production through borrowing is likely to be less effective. Younger operators were observed in the Survey to already have a high positive elastic demand for funds, and for older operators, the elasticity sign would need to be reversed.

This chapter outlines a procedure for a "second best" resource allocation solution based on the price mechanism, given that real and perceived institutional equilibria may be in conflict (15.1). A separate section advocates the development of a farm mortgage market in New Zealand.

17.1 A "Second Best" Solution to Resource Allocation

Farm credit literature often discusses the concept of non-price rationing of funds through security requirements, loan limits and onerous repayment terms. From Survey data these factors are not major rationing devices in New Zealand (5.16, 6.14). Deposits and trading business have been shown to be allocative devices for trading banks and stock firms respectively (Chapters 11, 12). For the State Advances Corporation an aggregate funds limit was the allocative device (Chapter 13).

Efficient resource allocation in the Paretian context requires balance in the factor and product markets (10.3). This is achieved through free operation of the price mechanism. Given that this is subject to constraint (e.g. 11.17) then imbalances may result. There may be a perceived balance in the factor market, despite use of non-price rationing devices, combined with imbalance in the product market.

The nature of the argument may be illustrated algebraically using trading banks as an example. Under the condition of interest rate constraint, trading banks try to achieve balance in the allocation of their factor market funds at the margin such that:

$$\frac{i_A \cdot \Delta^A + \Delta^A_D}{\Delta^A} = \frac{i_M \cdot \Delta^M + \Delta^M_D}{\Delta^M} \quad - (1)$$

where Δ^A , Δ^M represent dollar sums committed at the margin to agriculture and all other sectors respectively; i_A , i_M represent the mean interest rate on loans charged to these sectors, and Δ^A_D , Δ^M_D other income at the margin (e.g. imputed interest on deposits).

In the product market the equilibrium condition at the margin is:

$$\frac{\Delta^O_A}{\Delta^A_1} = \frac{\Delta^O_M}{\Delta^M_1} \quad - (2)$$

where Δ^O_A , Δ^O_M represent output, at constant prices, at the margin, and Δ^A_1 , Δ^M_1 funds committed; Δ^A , Δ^A_1 are not necessarily equal, but the equality necessarily holds that:

$$\Delta^A + \Delta^M = \Delta^A_1 + \Delta^M_1 = M \quad - (3)$$

Since there are given total funds, M , to be allocated at the margin. Given that funds are allocated according to (2) above, and that

$i_A \cdot \Delta^A_1$, $i_M \Delta^M_1$ and Δ^M_D are determined, then to retain equilibrium in the factor market:

$$\Delta^A_D = \frac{\Delta^A_1}{\Delta^M_1} \cdot (i_A \cdot \Delta^M_1 + \Delta^M_D) - i_A \cdot \Delta^A_1 \quad - (4)$$

To retain full equilibrium in the institutionally constrained situation, the increase in farm sector deposits required

is a function of:

- (i) the ratio of funds committed to agriculture and other sectors;
- (ii) the marginal return to the trading banks of loans to other sectors;
- (iii) the rate of interest on farm sector loans at the margin.

If the marginal increase in agricultural deposits and other business is less than per equation (4) above, then under the conditions of institutional constraint misallocation of resources in the factor market has occurred, since trading bank profit has not been maximised.

The observed imperfections in the pricing mechanism that cause this factor market imbalance permit a consideration of the "second-best" approach to resource allocation.¹ Consider the case where equilibrium is to be achieved in the final product market (equation 2). This may lead to factor market imbalance. The vice versa also applies (Table 17.1).

¹ For a comprehensive introduction to this concept see Lipsey, R.G. and Lancaster, K. "The General Theory of Second-Best", Review of Economic Studies, XXIV, No. 1 (1956-7), 11-33.

Table 17.1

Imbalances in Factor Market and Product
Market Equilibrium

<u>FINAL</u> <u>PRODUCT</u> <u>MARKET</u>	<u>Imbalance (1)</u>	<u>Imbalance (2)</u>
	(A)	(B)
	$\frac{\Delta^O_A}{\Delta^A^1} = \frac{\Delta^O_M}{\Delta^M^1}$	$\frac{\Delta^O_A^1}{\Delta^A} \neq \frac{\Delta^O_M^1}{\Delta^M}$ unless $\Delta^O_A^1 = \Delta^O_M^1 \cdot \frac{\Delta^A}{\Delta^M}$
Marginal output ($\Delta^O_A + \Delta^O_M$)		Marginal output ($\Delta^O_A^1 + \Delta^O_M^1$)
Marginal funds input		Marginal funds input ($\Delta^A + \Delta^M$)
	$(\Delta^A^1 + \Delta^M^1)$ ↓	↑
<u>FACTOR MARKET</u>		<u>FACTOR MARKET</u>
Returns to trading bank, from injecting Δ^A into agriculture -		Returns to trading bank, from injecting Δ^A into agriculture -
$i_A \cdot \Delta^A^1 + \Delta^A_D$ and Δ^M^1 induces a return of $i_M \cdot \Delta^M^1 + \Delta^M_D$		$i_A \cdot \Delta^A + \Delta^A^1_D$ and Δ^M induces a return of $i_M \cdot \Delta^M + \Delta^M^1_D$
but, $\frac{i_A \cdot \Delta^A^1 + \Delta^A_D}{\Delta^A^1} \neq \frac{i_M \cdot \Delta^M^1 + \Delta^M_D}{\Delta^M^1}$		so that $\frac{i_A \cdot \Delta^A + \Delta^A^1_D}{\Delta^A} = \frac{i_M \cdot \Delta^M + \Delta^M^1_D}{\Delta^M}$
unless condition (4) holds.		

To achieve balance in the final product market the additional increase in production will be

$$(\Delta^O_A + \Delta^O_M) - (\Delta^O_A^1 + \Delta^O_M^1)$$

But loss of income to trading banks will be

$$(i_A \Delta A + \Delta A_D^1 + i_M \Delta M + \Delta M_D^1) - (i_A \Delta A^1 + \Delta A_D + i_M \Delta M^1 + \Delta M_D)$$

This assumes that sectors' earnings to the trading banks are independent. A "second best" condition i.e. balance in final product market; imbalance in imperfect factor market will be that,

$$(\Delta O_A + \Delta O_M) - (\Delta O_A^1 + \Delta O_M^1) \geq \left\{ i_A (\Delta A - \Delta A^1) + i_M (\Delta M - \Delta M^1) + (\Delta A_D^1 - \Delta A_D) + (\Delta M_D^1 - \Delta M_D) \right\} \quad - (5)$$

i.e. as a result of "correct" final allocation, there is an increase in production at least as great as the loss of income to the trading banks.

The "second best" condition may be generalised with an additional variable added, λ , that reflects the "real" worth of a marginal increase in production. The "second best" condition (in constant price terms) is given by

$$\lambda A \geq B \quad - (6)$$

$$\text{such that } \lambda \geq B/A \quad - (7)$$

where λ is a parameter measuring the "real" worth of an increase in production; A is the increase in production resulting from the efficient allocation of resources in the product market; B is the loss of income in the factor capital market.

The concept of lambda is relevant in New Zealand with its reliance on export income from the agricultural sector. In concept it is broadly equivalent to a devaluation loading, since the effect of the variable is to inflate the output value.

Whilst the value of lambda must in the normal course be predetermined it can be calculated, given A and B, for a "second best" efficient allocation of resources. (Table 17.2).

Table 17.2

Arithmetical Examples of Lambda Calculation

$(\Delta A + \Delta M) = (\Delta A^1 + \Delta M^1)$	A (increase in prodn.)	B (income loss)	$(\lambda \gg)$
(100)	20	10	0.5
(150)	30	30	1.0
(200)	40	50	1.25

The concept of lambda can be extended further so that,

$$\lambda P_A + P_M \gg B$$

where $P_A + P_M = A$ and agricultural output increases are weighted heavier than "other" output increases, which in the New Zealand context will mainly be output for the domestic market.

In this case, for the "second best" efficient allocation of resources

$$\lambda \gg \frac{B - P_M}{P_A}$$

The value of lambda for a "second best" solution can be calculated given P_A , P_M and B (Table 17.3), but in the normal course it must be predetermined.

Table 17.3

Arithmetical Calculations of the Magnitude of Lambda

F_A	F_M	B	(λ)
20	10	10	0
30	0	30	1
40	-10	50	1.5

Thus, if output increases in agriculture are small at the margin relative to other output increases or loss of income in the factor market, then the lambda factor must be proportionately greater. To determine a real lambda value in the open economy is not a function of this discussion. It will be determined by

- (i) the relative size of the economy's external trade sector;
- (ii) the role of agriculture in (i) above;
- (iii) ex-ante income potential from agriculture and from other sectors.

Given this lambda value a "second best" allocation of resources is possible. A major problem is that of identification - i.e. institutions operating in the capital factor market may be aware of their own equilibrium, but unaware of equilibrium in the product market. In these circumstances a critical policy aim is to identify product market equilibrium (the practical problems

of achieving this goal are not discussed), and try to achieve this through operations in the factor market, for instance by stimulating returns in that market. Assuming that agricultural output at the margin is positively weighted, returns could be increased by providing factor market incentives such as:

- (i) the granting of tax concessions on interest paid by farmers to lenders. In this way the factor market farm interest differential could be removed (11.17);
 - (ii) providing tax reliefs on loans made to farmers.
- This might be expected to have the effect of spreading the "cost" burden of the interest rate differential amongst all the tax paying community.

The effect of these measures would depend on the extent of the national identification problem (i.e. the discrepancy between real and perceived institutional equilibrium), the extent of rigid non-price rationing in operation, and the magnitude of the lambda parameter.

17.2 Resource Allocation - A Note on the Effect of Prices

The analysis above is based on constant price assumptions. Prices are dynamic over time and what may be an efficient ex-ante allocation at time t , may prove to be an inefficient allocation at time $t + 1$. Ex-ante marginal

return estimation is necessarily based on incomplete information, but the "best" estimate is necessary for efficient resource allocation. Even so, ex-post misallocation may result from:

(i) incorrect misallocation resulting from a biased estimate of return;

(ii) random price or output variance.

Ex-post misallocation resulting from (i) above necessitates the development of community education. Ex-post misallocation resulting from (ii) above (such as an unforeseen change in prices), may require welfare considerations.

The implication is that price fluctuation in the practical context precipitates additional allocation difficulties at the margin. This is especially relevant to the farm sector. A case for assistance to the farm sector (e.g. as a result of an officially encouraged occurrence of heavy debt to increase production in anticipation of high prices that did not eventuate) can be made on criteria (ii) above rather than criteria (i). In considering welfare programmes of assistance to the industry, it is necessary for the policy maker to identify the misallocation cause in determining relevant measures of assistance.

17.3 Resource Allocation - State Advances Corporation

Corporation rationing devices were based on the aggregate funds position and were observed to include individual and aggregate loan limits. Though evidence was not conclusive, direct funds limits may impede the optimal flow of resources to agriculture. One innovation that may remove this artificial discrimination would introduce negotiability and liquidity elements into agricultural financing. The development of a rural mortgage market is envisaged. This system of financing is well developed in Denmark.² Briefly, the procedure there is that lending institutions grant prospective borrowers mortgage bonds against the security of land, which are sold as financial instruments on the market for cash. The borrower repays mortgage monies to the lending institution in the normal way, but receives funds from the market. Bonds are subsequently traded on the market as financial assets.

A market for rural mortgages in New Zealand would have the effects of:

- (i) increasing the flexible utilisation of farm asset security;

² See Skovboek, J. "The Financing of Danish Agriculture", pps. 199-211 in Knudsen, E., ed., Agriculture in Denmark: London, Land Books Ltd., 1967.

- (ii) allowing the farm sector to compete for term finance on a more equitable basis vis-à-vis other sectors. This is a result of the influence of yield as a market variable. Yield introduces a common element into both the short and long term capital markets;
- (iii) helping to develop a more sophisticated capital market in New Zealand.

In theory the Corporation could develop the market by issuing gilt edged bonds to suitable finance applicants. These would be sold on the open capital market and subject to market pricing factors. Funds could be supplied to the farm sector at some rate of interest and under free market conditions bonds would be discounted or transferred at a premium, depending on the mean capital market yield and bond growth prospects.

A major problem of this financing concept to the individual farmer would be the effect of the market discount. Since Corporation bonds would be gilt edged, as a result of the Corporation's observed relationship with Government, the discount would depend primarily on the interest differential of the bond from the market yield, plus a random variance. An \$x nominal value bond, carrying interest at the rate of $r_1\%$, compared with mean market yield of $r_2\%$ would in theory sell on the market at price P where

$$P = \frac{r_1}{r_2} \cdot x + \mu$$

- (1)

where μ is a random disturbance and there is no risk attaching to bond loss.

The indirect effect of raising finance on market terms is that a farmer borrower does pay the market rate of interest, though as one capital sum rather than over the course of a loan.

Since availability was observed to be a major factor influencing borrowing decisions (4.12), the effect of the market discount may not add appreciably to the real cost of borrowing (Table 17.4). Comparisons are made between the present value of future annuity payments less receipts from

- (i) a 5½%, 25 year term Corporation mortgage, with principal sum discounted by the market, according to differential below market rate, with
- (ii) a similar term table mortgage at market rate.

An example of the calculations is shown below. The comparison is between net cost of a \$1,000 loan at a 5½% concessionary rate, subject to discounting, and a 6% market rate loan.

5½% mortgage - annual instalment for 25 years of \$74.50;
 present value, (5% discounting factor), \$1,049.71;
 receives, from formula (1) above \$916.60; present value
 net cost \$133.11;

6% mortgage - annual instalments for 25 years of \$78.24, present value (5% discounting factor); \$1,102.40; receives \$1,000; present value net cost \$102.40.

Therefore additional cost (present value) of discounted concessional rate mortgage, over market rate mortgage \$30.71.

Other calculations are made in a similar fashion.

Table 17.4

Dollar Excess Cost (Present Value) of Bond Discounting over Mortgage Charged at Full Market Rate
(SAC concessional rate - $5\frac{1}{2}\%$, 25 year table mortgage)

Market Rate (interest rate differential)	6% ($+1\frac{1}{2}$)	7% ($+1\frac{1}{2}$)	8% ($+2\frac{1}{2}$)	10% ($+4\frac{1}{2}$)
Discounting Factor				
5%	30.71	55.81	41.98	15.52
6%	35.60	70.27	67.12	27.75
7%	39.83	81.45	88.82	65.09
10%	49.44	111.97	160.24	150.00

From this table a number of observations are apparent:

- (i) given the market rate, the excess cost will increase as the discounting factor increases;
- (ii) given the discounting factor, the excess cost will rise and subsequently decrease. There will be a market rate

of interest, i_M , where costs are equal for either course of action, where

$$\frac{i_M \cdot (1+i_M)^n}{r \cdot (1+r)^n} \left(\frac{(1+r)^n - 1}{(1+i_M)^n - 1} \right) - 1 = \frac{i_c \cdot (1+i_c)^n}{r \cdot (1+r)^n} \left(\frac{(1+r)^n - 1}{(1+i_c)^n - 1} \right) - \frac{i_c}{i_M}$$

and, r = discount rate (5%)

n = length of mortgage term (25 years)

i_c = concessional interest rate (5.5%)

For example, from this equality and the given data in parentheses above, at a market rate of interest of approximately 12.1%, there will be no net present value benefit of either market course.

(iii) the present value of excess costs is only heavy (greater than 10% of principal) where there is a large variance between market and bond interest rates, and where the discounting factor is heavy.

Under contemporary conditions in New Zealand, with a relatively low discounting factor (i.e. Government stock yields and equity yields, as alternative rates of return), and a differential of market above Corporation lending rate of around 1½%-2% there would be a cost of around 5% of principal to be paid for funds availability. With the increase in some Corporation rates to 7%

(13.12) the cost premium would be around 3% of principal. This premium is low and it does facilitate increased availability of funds to the borrower through free market operations. From the lender's viewpoint the purchase of bonds would preclude the necessity of lending to the farm sector at competitive market rates. The purchase of bonds would also introduce an element of flexibility and negotiability into investment portfolios, neither characteristic having been features of traditional farm mortgage lending. The development of a mortgage market, subject to Corporation control and surveillance, would also help to remove possible inefficiency effects of the present policy of allocation by funds limits.

CHAPTER EIGHTEEN

The Farm Ownership Concept18.1 Introduction

The concept of farm ownership has been shown to have considerable relevance to the farm firm utility structure both in theory (Chapter Two) and in practice (Chapters Four and Eight). This chapter discusses a number of facets of the concept in relation to the need for external funds to finance farm purchase.

- (i) the effect of "farm ownership productivity" on the allocation of resources in a simple theoretical circular system (18.2);
- (ii) the economic problems created by farm ownership in the context of the efficiency of resource allocation (18.3);
- (iii) the variation in resource flow patterns under private and state land tenure systems (18.4).

Some conclusions are drawn and policy suggestions made in Section 18.5.

18.2 The Effect of "Farm Ownership Productivity" on Resource Allocation

A case study conducted by the State Advances Corporation in the Waikato has shown that there was on average a 27% ($\pm 7\%$) increase in production over a three year period, by the 106 farmers settled in the region during the 1965/6 financial year¹. This increase will have been influenced by autonomous productivity factors, and by the injection of external funds, but an element is attributable by the Corporation to the

¹ State Advances Corporation of N.Z., Background Paper II, op. cit. p.13.

incentive effect on production of farm ownership². The effect is achieved through the infusion of young operators into the sector who have a desire to own their own farms. This production effect is related to the volume of funds allocated to permit young operators to purchase farms, and a capital-output ratio concept can therefore be identified.

There are two other classes of farm capital to consider apart from land. These are development and on-farm capital and working capital. The average and incremental capital-output ratios of these capital types will vary. Land is the basic farm asset, and *ceteris paribus* its incremental capital-output ratio will be low i.e. as the rate of farm transfers increases, and additional marginal capital is required³, direct marginal output returns will be low. However, farm purchase monies may be envisaged as a constituent of the circulation velocity of money, since funds allocated for farm purchase do not represent resource commitment at the limit. Farm purchase lending will release funds to be utilised for other purposes. This concept can be illustrated diagrammatically (Fig. 18.1) under the assumptions:

- (i) no agricultural vendor finance;
- (ii) average capital-output ratio is equivalent to the incremental capital-output ratio;
- (iii) comparative static rather than dynamic allocation
i.e. no time lags;

² The Research Section of the Corporation is undergoing exploratory work to identify more precisely these component influences, through an econometric model.

³ On the assumption that an increasing transfer rate requires additional borrowed capital. A capital gain element is also generally implicit in farm land transfer deals.

- (iv) the economy is not operating at a full employment level;
- (v) constant prices and divisible capital;
- (vi) funds released as a result of new purchase are not used for purchase again.

It is necessary to consider two cases.

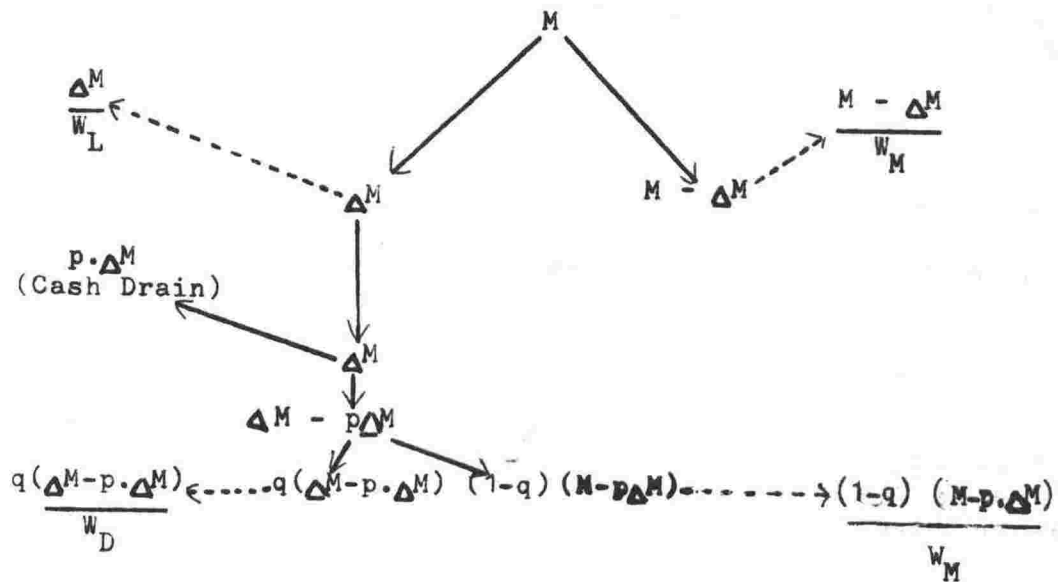
CASE I:

Non-Farm Sector Productivity

Greater Than Farm Productivity

Fig. 18.1

Diagrammatic Representation
of the Effect of Farm Purchase Lending



- where M = funds available for investment, at the margin;
- Δ^M = proportion of funds allocated for farm purchase;
- $M - \Delta^M$ = proportion of funds allocated for other purposes;
- W_M = capital-output ratio, non-farm sector;
- W_L = capital-output ratio, reflecting production incentive effect of land purchase and ownership;
- and Δ^M/W_L = additional output resulting from land transfer;
- $p \cdot \Delta^M$ = proportion of released funds drained from system (e.g. proceeds of farm sale hoarded or consumed);
- q = proportion of available capital allocated to the farm sector, and $(1-q)$ proportion of available capital allocated to the non-farm sector;
- w_D = agricultural capital-output ratio, non-farm purchase.

The equilibrium condition is that:

$$\frac{\Delta^M}{W_L} + \frac{q \cdot (\Delta^M - p \cdot \Delta^M)}{W_D} = \frac{(M - \Delta^M)}{W_M} + \frac{(1-q)(\Delta^M - p \cdot \Delta^M)}{W_M} \quad - (1)$$

i.e. the incremental capital-output ratio at the margin is equated, which implies that:

$$\frac{W_D \cdot \Delta^M + W_L \cdot q(\Delta^M - p \cdot \Delta^M)}{q(\Delta^M - p \cdot \Delta^M)} = \frac{W_L \cdot W_D}{W_M} \quad - (2)$$

and

$$\frac{W_D + W_L q(1-p)}{q(1-p)} = \frac{W_L \cdot W_D}{W_M} \quad - (3)$$

A true equilibrium solution would require that there be no loss to the system, $p = 0$, and,

$$\frac{W_D + q \cdot W_L}{q} = \frac{W_L \cdot W_D}{W_M} \quad - (4)$$

$$\text{such that } q = \frac{W_M \cdot W_D}{W_L(W_D - W_M)} \quad - (5)$$

Equation (5) would require the additional condition that:

$$W_L(W_D - W_M) \geq W_M \cdot W_D, \text{ for a solution} \quad - (6)$$

(or else case II below would apply)

and $W_D \neq W_M$.

From conditions (1), (5) and (6) a series of arithmetical examples may be given, to indicate the effect on resource allocation, where the farm purchase transaction is an intermediate funds flow (Table 18.1).

Table 18.1

Arithmetical Examples of Optimal Resource Allocation
Given Farm Purchase Requirements (no drain from system)
 (M = 100 in all cases)

(i) $W_M = 4$, $W_D = 5$, and therefore from (6) above $W_L \geq 20$

	<u>$\Delta M = 40$</u>		<u>$\Delta M = 50$</u>		<u>$\Delta M = 60$</u>	
	<u>Agric.</u>	<u>Non Agric.</u>	<u>Agric.</u>	<u>Non Agric.</u>	<u>Agric.</u>	<u>Non Agric.</u>
$W_L = 25 \rightarrow q = 0.8$	32	68	40	60	48	52
$W_L = 30 \rightarrow q = 0.67$	26.8	73.2	33.5	66.5	40.2	58.2
$W_L = 40 \rightarrow q = 0.50$	20	80	25	80	30	70

(ii) Increase in non-farm sector productivity, such that

$$\underline{w_M = 3, \text{ and therefore from (6) above } w_L \gg 7.5}$$

	<u>$\Delta^M = 40$</u>		<u>$\Delta^M = 50$</u>		<u>$\Delta^M = 60$</u>	
	<u>Agric.</u>	<u>Non Agric.</u>	<u>Agric.</u>	<u>Non Agric.</u>	<u>Agric.</u>	<u>Non Agric.</u>
$w_L = 25 \rightarrow q = .30$	12	88	15	85	18	82
$w_L = 30 \rightarrow q = .25$	10	90	12.5	87.5	15	85
$w_L = 40 \rightarrow q = .1875$	7.5	92.5	9.375	90.625	11.25	88.75

The effect of cash drain is that

$$q = \frac{w_M \cdot w_D}{(w_L \cdot w_D - w_M \cdot w_L)(1-p)} \quad - (7)$$

Subject to

$$w_L(w_D - w_M)(1 - p) \gg w_M \cdot w_D \quad - (8)$$

From previous data, the effects of changes in p can be noted in an arithmetical example (Table 18.2).

Table 18.2

Arithmetical Examples of Optimal
Resource Allocation Given Farm Purchase
Requirements
 (Drain from System)
 (M = 100)

(i) $W_M = 4$, $W_D = 5$, $p = .25$, and from (8) above $W_L \geq 26.7$

	<u>$\Delta^M = 40$</u>		<u>$\Delta^M = 50$</u>		<u>$\Delta^M = 60$</u>	
	<u>Agric.</u>	<u>Non Agric.</u>	<u>Agric.</u>	<u>Non Agric.</u>	<u>Agric.</u>	<u>Non Agric.</u>
$W_L = 30 \rightarrow q = .89$	26.7	63.3	33.4	54.1	40.1	44.9
$W_L = 40 \rightarrow q = .67$	20.1	69.9	25.1	62.4	30.2	54.8

(ii) Increase in non-farm sector productivity, such that

$W_M = 3$, and from (8) above $W_L \geq 10.1$

	<u>$\Delta^M = 40$</u>		<u>$\Delta^M = 50$</u>		<u>$\Delta^M = 60$</u>	
	<u>Agric.</u>	<u>Non Agric.</u>	<u>Agric.</u>	<u>Non Agric.</u>	<u>Agric.</u>	<u>Non Agric.</u>
$W_L = 25 \rightarrow q = .40$	12	78	15	72.5	18	67
$W_L = 30 \rightarrow q = .33$	10	80	12.5	75	15	70
$W_L = 40 \rightarrow q = .25$	7.5	82.5	9.375	78.125	11.25	73.75

Comparisons between Table 18.1 and Table 18.2 indicate that the effect of a cash drain is to reduce the funds volume committed to the non-farm sector, rather than to the farm sector. This is as a result of the constant capital-output ratio assumption above. The effect of an increase in p , the withdrawal of cash ratio, is to increase the given W_L ratio required for a

solution, from (8) above.

From these examples, where the non-farm sector incremental capital-output ratio is lower than the farm sector ratio, the effect of borrowing for the purchase of farms is to inflate aggregate farm sector productivity, and this will allow a flow of funds for development and other productive purposes to the sector. If there were no additional productivity available from land transfer, then the entire volume of marginal funds, M , would be allocated to the non-farm sector as a result of capital-output variances. From Table 18.1 above, as the non-farm sector productivity increases relative to the farm sector, the proportion of marginal funds allocated to the farm sector in the final instance will decline.

CASE II:

Farm Sector Productivity Greater Than Non Farm Sector Productivity

$$(w_D < w_M)$$

In this case the equilibrium condition would be
(from Fig. 18.1 symbols)

$$\frac{M - \Delta^M}{w_D} + \frac{\Delta^M}{w_L} + \frac{q(\Delta^M - p\Delta^M)}{w_D} = \frac{1}{w_M} \quad - (9)$$

$$(M - \Delta^M) + q(\Delta^M - p\Delta^M)$$

But since it is given that $W_D < W_M$, then all marginal funds would be allocated to agriculture and the real productivity differential would widen. In the case where there is a cash drain element then there will be a loss of funds committed to the farm sector.

18.2 Problems of Farm Ownership

The above analysis has shown that in the context of economic efficiency, the productivity effects of land transfer may require funds to be allocated to the farm sector, even though farm sector productivity (excluding the infusion effect) at the margin is lower than non-farm sector productivity.

In the actual market environment this efficiency condition may not be identified. This is primarily a result of an incompatibility between perceived institutional optimal allocation of funds and real optimal allocation (15.1). A financial institution operating under marginal conditions may be aware only of the final productivity factors, W_D and W_M . It may not be aware of:

- (i) intermediate W_L effects;
- (ii) the flow of funds released from agriculture resulting from purchase.

It is unlikely that funds released would accrue in entirety to the institution providing funds for new purchase and there would be an implicit funds loss to that institution.

Therefore the optimal policy for an institution with funds at the margin, M , is to allocate where returns are greatest

i.e. the non-farm sector (the assumption is that $W_M < W_D$).

This may be at variance with national optimal resource allocation as above (e.g. Table 18.1).

There are a number of other problems that will tend to distort an optimal allocation and these result from the demand for farms. The farm sector has traditionally been accustomed to borrowing for farm purchase, particularly from Government sources, at below market rates of interest (Fig. 13.2). Farm purchase prices are not generally related to productivity. In an investigation into the sheep farm sector, the Finance Sub-Committee of the Agricultural Production Council has noted that:

"... (there is an) unwillingness of sellers to sell properties at what are more realistic values, in relation to present earning capacity..."

but that

"... under present conditions there will be greater attention given to earning capacity in relation to land prices paid by farmers..."⁴

Another problem is that of the increasing entry requirements for prospective farm operators. The average size of farm

⁴ New Zealand, Agricultural Production Council (Economics Committee), Interim Report on the Review of the Sheep Industry, Wellington, Nov. 1971, pps. 41, 42.

business in New Zealand (including livestock and plant) has increased from \$44,000 in 1963 to \$87,000 in 1970.⁵ The problem of substantial farm sector entry requirements is not restricted to New Zealand and the O.E.C.D. has commented that:

"... full ownership is becoming more and more impracticable for those setting up in farming in spite of the fact that it is still quoted as a policy goal...".⁶

This organisation is a strong advocate of the development of alternative systems of land **tenure** such as land ownership by the State (13.19). The advantages of such a system might be:

- (i) the divorce of ownership from control with its attraction of a professional managerially orientated farm operator stock, with profit rather than ownership goals;
- (ii) the attraction of an operator class with managerial ability rather than a class possessing essentially hereditary wealth;
- (iii) a reduction in the circular and generation net inflow of funds to the farm sector for refinance purposes.

5 (168) p. 59.

6 (171) p. 104.

The disadvantages of alternative systems of land tenure where ownership is divorced from control are:

- (i) the loss of a W_L productivity effect. This was defined to represent the production incentive effect of land ownership;
- (ii) the final commitment of resources to the land factor rather than a commitment in the circular flow as in Fig. 18.1;
- (iii) the volume and availability of funds that would be necessary to effect a change in the structure of land tenure;
- (iv) the social implications and possible unacceptability of what in effect would be land nationalisation (voluntarily or involuntarily) in the structure of New Zealand's mixed economy. However, despite this historically strong desire of farm operators to own land, in the interests of social equality this cannot be accepted as a right.

The concept of State purchase of land is now considered in more detail in 18.4.

18.4 State versus Private Land Tenure: Effect on Resource Flows⁷

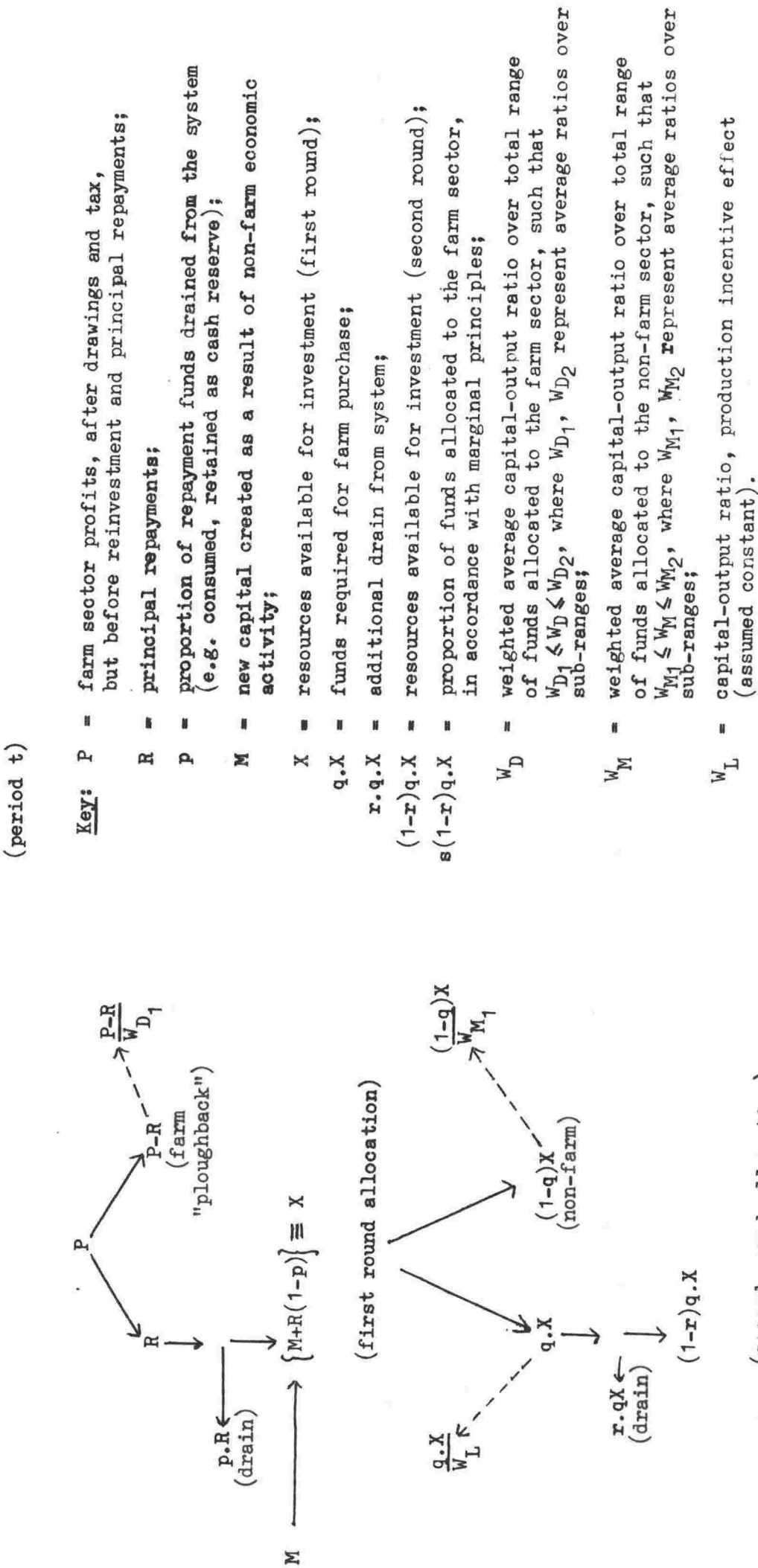
Ceteris paribus, a State leasehold tenure system is economically justifiable if the present value of final total output were to exceed the present value under the contemporary land tenure system. With the predominance of the agricultural sector in New Zealand's economy, the choice of tenure system might be interpreted as that which increases the present value of final farm output. These two policy aims are not necessarily reconcilable, but implicit in both is the need for an equitable distribution of income.

The capital flows resulting from these alternative systems of land tenure can be compared (Figs. 18.2, 18.3). The nature of these figures implies that new resource allocation is a step process, and that resources generated from economic activity are not simultaneously or instantaneously reallocated. The step process has resulted from considering resource allocation in the institutional environment, and this consideration will restrict the probability of attainment of real equilibrium.

In this analysis the assumptions of 18.2 above are still relevant, and in particular that the discussion is conducted largely in terms of a static environment. Some relaxation is necessary to allow for the effect of diminishing marginal returns in resource allocation. Average and incremental capital-output ratios are therefore not necessarily assumed to be equal.

⁷ The analysis is simple. Detailed study of Crown Land leases is not contemplated, but the pattern of resource flows under various lease types is worthy of separate study. As an example, see Evans, L.T. "An Examination of Some Investment Decisions under Crown Renewable Lease Tenure", unpubl. M.Agr.Sc. thesis, Univ. of Canterbury, 1971.

CASE I: PRIVATE FARM PURCHASE
 Fig. 18.2 The Flow of Funds and Production Increases in a
 System of Private Farm Purchase and Freehold Tenure



The rationale of Figure 18.2 is that P , R and $q.X$ will be predetermined within the framework of the institutional environment. In the first round of allocation, institutions and lenders satisfy the demand for farm purchase monies, $q.X$, and allocate the balance to the non-farm sector⁸. Subsequent second round allocation will be determined such that $W_{D2} = W_{M2}$ at the margin. This is achieved through variation in the parameter, s . Over the total range of funds allocated, W_D does not necessarily equal W_M .

Total increases in production in time t resulting from these resource flows will be:

$$\underbrace{\frac{\{(P-R) + s(1-r)q.X\}}{W_D}}_{(A)} + \underbrace{\frac{q.X}{W_L}}_{(B)} + \underbrace{\frac{\{X(1-q)(r-s+sr)\}}{W_M}}_{(C)}$$

This increase is based on the assumption that production increases are not subject to time lags.

CASE II: LAND PURCHASE BY THE STATE

Figure 18.3 represents the flow pattern of capital resources under a system of systematic State purchase of land. The assumptions are that:

⁸ An additional possibility, not followed here, would be to allocate this balance to the two sectors according to marginal principles. Such a move would lead to further complications.

- (i) instantaneous land purchase by the State is not contemplated. Johnson⁽¹¹⁴⁾ has estimated the market value of the capital stock in land and buildings (including some existing Crown lease land) to be \$2821m. in 1969/70. Debt outstanding on this stock of capital would have been at least \$900m. (20.1). This stock represented 23% of the estimated capital value of land and improvements (\$12,516m.) in New Zealand at that time⁹. In view of this magnitude, instantaneous State purchase of farm land at market prices is not considered to be feasible. This assumption therefore has the effect that until complete land ownership by the State is effected, principal repayments, R^* , would continue to include a land debt component. However, it is reasonable that:

$$R^* \leq R, \text{ for all } t,$$

and that $R^* + T \leq R$, where T represents rent payments;

- (ii) the sale of farms is an autonomous process. In the under-employed economy this supply is always met with a demand from prospective occupiers. As a result, equivalent funds are required to facilitate either State or private purchase;

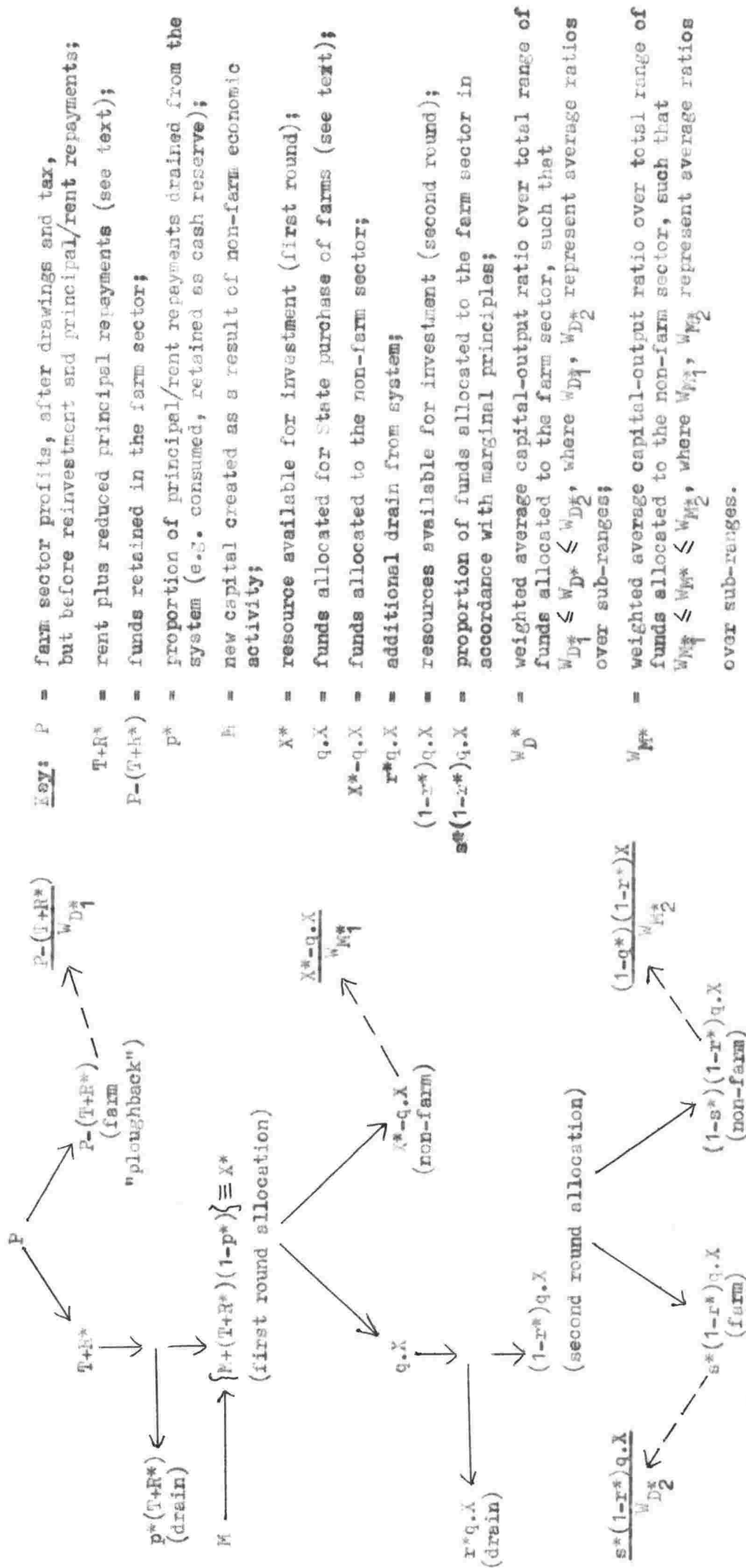
⁹ New Zealand Year Book, 1971, p.294

CASE II: LAND PURCHASE BY THE STATE

Fig. 18.3 The Flow of Funds and Production Increases in a

System Permitting State Farm Purchase

(period t)



(iii) the total loss to the system ($p.R + r.q.X$ in Fig. 18.2 above) will be the same under either alternative;

(iv) funds to facilitate State purchase of land can be made available. This requirement does merit a detailed discussion of the taxation policies and allocative role of Government in the economy, but this is not the purpose of this thesis.

Total increases in production resulting from the flows in Figure 18.3 will be:

$$\underbrace{\{P - (T + R^*) + s^*(1 - r^*)q.X\}}_{\substack{W_{D^*} \\ (D)}} + \underbrace{\{X^* - q.X(r^* + s^* - s^*r^*)\}}_{\substack{W_{M^*} \\ (E)}}$$

where $W_{D^*1} \leq W_{D^*} \leq W_{D^*2}$ and $W_{M^*1} \leq W_{M^*} \leq W_{M^*2}$, as above.

The logic of Figure 18.3 suggests that all farm sector profits, after rent and principal repayments, will be reinvested in the farm sector, and that funds, $q.X$, used by the State to purchase farms from willing sellers, will be used by the sector to pay off debt on land¹⁰. It is given above that $R^* + T \leq R$, for all t .

¹⁰ in practice, individual current sellers may not be carrying a debt load; an implicit assumption is that proceeds from sale under these conditions will still be returned in part to the system.

Ceteris paribus, in a dynamic context, an increasing proportion of profits, P , is likely to be retained by the farm sector for reinvestment. The corollary is that proportionately less funds, X^* , will be available for competitive re-allocation in the economy. A system of State land purchase would therefore require strong a priori knowledge that marginal farm sector productivity was high relative to that of the non-farm sector. Under a system of State land purchase, the "trapping" of funds within the farm sector is more easily facilitated. Under a system of freehold tenure there is likely to be a larger flow of resources available since principal repayment necessitates the release of resources from the sector.

Given these comments, State ownership of land and a resultant leasehold tenure system would be economically justifiable in this simple model if:

$$D + E \geq A + B + C \quad (1)$$

if the policy aim is to increase total output, or,

$$D \geq A + B \quad (2)$$

if the policy aim is to increase farm output only.

Condition (1) takes into account the effect on production of new resources allocated to both the farm and the non-farm sectors, whereas condition (2) is concerned only with the effect of this distribution on farm production. Under condition (1), a system of leasehold tenure might be advocated if:

$$E \geq C \quad (3)$$

(increase in non-farm production)

$$\text{and} \quad A + B \geq D \quad (4)$$

(decrease in farm production)

$$\text{subject to } (E-C) \quad (A-B) - D \quad (5)$$

Condition (4) is inconsistent with condition (2) above, unless $A + B = D$ i.e. no effect on farm production of either tenure system. The choice of tenure system advocated might therefore depend on the policy aim. In the long term the tenure system that maximises total production, and that satisfies condition (1) above, must be the correct policy choice. However, the effect of extraneous influences in the real environment, such as the activities of farmer pressure groups, might distort this aim.

To correctly advocate the choice of tenure system the policy maker would need to determine the elements of inequalities (1) and (2) above. Even within the confines of this simple framework, extensive data research would be necessary. Some elements would be predetermined by the system, but a priori information would be needed on the productivity of resource use in the farm and the non-farm sectors. This is because in determining the elements of the inequalities:

- (1) the average $w_D, w_{D^*}, w_M, w_{M^*}$ ratios are influenced by changes in the magnitude of s and s^* ;

- (ii) s and s^* are themselves influenced by the incremental capital-output ratios of the farm and the non-farm sector.

This data search would be less acute if a priori evidence showed that productivity in one sector was consistently higher than in the other or that the law of diminishing returns was not operative. To correctly assess the choice of tenure system, a detailed study of cash drain patterns would also be necessary. Both these data collection exercises are beyond the scope of this discussion, the aim of which has been to highlight variables to be considered by advocates of alternative land tenure systems.¹¹

Given the above discussion, some comments can be made on the feasibility of State land purchase in New Zealand at the present time. Crude estimates based on incomplete data suggest that principal cash repayments from the farm sector were around \$85m. in the 1970/71 financial year (of which \$75m. were for land purchase), and cash inflows for new purchase \$165m., both figures net of paper refinance transactions. In that year the State provided \$12m. for farm purchase, and received about \$8m. in purchase principal repayments. The State would have needed to provide at least an additional \$153m. to follow the policy described above. *Ceteris paribus* this sum would require an increase in government revenue of 9%. An expenditure of \$165m. on land purchase would represent 140% of the expenditure on defence in that year, or 43% of the expenditure on

¹¹ Some simple arithmetical examples, indicating production alternatives under the two tenure systems, are however discussed in Appendix G.

social security in that year¹².

In the first year of State purchase, 1970/71, the saving to the farm sector would have been under \$10m., less rent paid to the State. This would be less than one per cent of estimated gross farm income¹³. The ex-ante saving to the farm sector would increase over time. It might also increase as a result of:

- (i) pressure by existing mortgagees to foreclose their mortgages. Concomitant sale to the State by mortgagors might result;
- (ii) the relative state of buoyancy/depression in the farm sector. This will have an influence on the autonomous flow of sales.

However, these factors might exert additional pressure on the State to raise funds in the first instance.

Apart from the volume of funds required by the State for "first-round" allocation under contemporary conditions, a system of systematic State purchase of land would be subject to other problems. The simple model above has not made allowance for the institutional identification problem (17.1), which may distort the flow of resources into agriculture. The effects of a high rate of inflation, a recent phenomenon in New Zealand, would need to be incorporated into the

¹² Budget 1971, op.cit. Tables No.3 and 4, pps.45, 46.

¹³ Agricultural Production Council⁽¹⁶⁸⁾ p.41.

model for it to be practically useful. The high proportion of farm debt held by the private sector (20.1) might result in a heavy cash drain function, or alternatively the need for heavy private taxation or death duty policies to provide Government funds in the first instance. These measures might not be politically acceptable.

The conclusion from this limited discussion is that the alternative system of land tenure examined would require an increase in the role of the State in resource allocation and as a result a change in the political rather than the economic ideology of the community. Prerequisites for the introduction of a leasehold tenure system are:

- (i) for farm sector productivity to be high relative to non-farm sector productivity;
- (ii) for increases in farm sector production to be checked as a result of the burden of principal repayment on land debt.

These requisites have not been identified in this thesis or from continual investigations into the sector by quasi-Government bodies, such as the Agricultural Production Council.

18.5 Conclusions

Considerable research is needed into the economics of farm purchase, but in particular to determine:

- (i) the motivations behind land purchase, especially where price is markedly at variance with discounted productivity valuation;
- (ii) the "farm ownership productivity" effect;
- (iii) the cash drain function, resulting from farm purchase activity;

From discussion in 18.4 above, the broad conclusion was that the system of private land tenure was more likely to facilitate a freer funds flow, given the contemporary political environment, than a system of State tenure. Policies are therefore needed to:

- (i) ensure that land price is related as closely as possible to productive valuation. This is likely to be difficult particularly in the over-fully employed economy;
- (ii) minimise the cash drain function, p;
- (iii) allow institutions a "feedback" of vendor proceeds, to permit a closer and more uniform identification of efficient resource allocation patterns;

- (iv) ensure that farm operators are not impeded in their search to obtain purchase finance on market terms;
- (v) associated with (iv) above, to ensure that the distribution of the national asset stock is equitable.

The development of a rural mortgage market (17.3), would help to achieve policy objectives (iii) and (iv) above. With this market the farm sector would be a relatively more attractive outlet for investible funds as a result of the yield-discount interaction, and the negotiability and liquidity elements introduced.

An alternative policy to increase the attractiveness of farm sector investment would be the granting of interest rate subsidies to lenders, or the granting of tax exemptions on their rural lending. On the other hand, whilst fostering funds availability through these means, policies need to be designed to avoid a distribution of wealth in favour of the land owning classes. The effect of progressive death duty rates on production needs to be investigated.

In the long run, a policy of laissez-faire combined with a policy of business education of new farm operators might achieve a greater awareness of the need to relate land values to productivity, particularly when farm purchase is externally financed. Johnson⁽¹¹⁵⁾ has related changes in the price of land to changes in expected productivity and in farm sector confidence. He does not consider the problem of onerous debt repayment brought about by imprudent borrowing as a result of these factors. An untested hypothesis is that under

contemporary New Zealand conditions there is always likely to be an expected capital gain element in the price of farm land, which may lead to borrowing in excess of expected direct return. This is because the industry is subject to implicit Government guarantees of support. The effect of removal of these supports, and the substitution of a laissez-faire policy may lead to hardship in the individual case, particularly when product prices are falling. This state may be unacceptable to the community.

It has been shown above to be necessary to encourage the reinvestment of the proceeds of land sale into the economy. In conditions of full employment this is likely to be inflationary, but in the excess capacity environment has been shown to be a necessary step in the efficient allocation of resources (Fig.18.1). It is not however proposed to consider broader policies designed to stimulate savings and investment in the economy.

In conclusion, this chapter has shown that as the farm purchase transaction is an aspect of the circular flow rather than a final commitment of resources, lending for farm purchase may not necessarily induce resource misallocation. Under contemporary New Zealand conditions, systematic State purchase of land is unlikely. However, this conclusion is only tentative, and a huge volume of research is necessary in this field.

CHAPTER NINETEEN

The Interest Rate Concept19.1 Introduction

This chapter discusses a number of facets of the interest rate concept. Some comments are made on the stated case by the farm sector for concessional rates (19.2). These are based on evidence submitted to the Committee of Inquiry into Lending to Farmers. The comments show that the farm sector has a deep seated belief in the sanctity of its right to concessional rates.

Concessional rates are implicitly advocated by the Authorities (e.g. 11.17), and this may partly explain the observed lack of an "interest rate" problem from Survey data (4.7, 5.12, 6.9). The concept of concessional rates is discussed in theory in 19.3, and a "second best" allocation model developed. Some concluding comments are made in 19.4 on the possible effects and likelihood of an increasing use of the price mechanism as a funds rationing device.

19.2 The Arguments for Concessional Rates

It has been stated that:

"... interest rates are an essential instrument in the economy, guiding the distribution of credit as between different sectors. Privileged treatment for any one sector may lead to an uneconomic allocation of funds ..."¹

¹ O.E.C.D. (171) p.95.

The allocative function of interest rates is central to the concept of economic equilibrium, and in the general economic system the interest rate may be conceptually envisaged as being identical to the marginal rate of return on new investment. In theory interest rates are relevant to the borrowing decision, particularly at the margin.

From Survey results (Table 4.14), interest rates were not observed to be the major factor influencing the borrowing decision. This conclusion is supported by verbatim evidence given before the Committee of Inquiry into Lending to Farmers. The Dominion President of Federated Farmers of New Zealand Inc. stated that:

"... interest rates do not affect the decision to borrow ... concern about interest rates comes later ..."²

The major arguments in favour of concessions are not based on the allocative role of the rate of interest in the economy. The arguments can be summarised:

- (i) The cost and viability argument. The belief is that interest rates must remain "reasonable" to maintain viable units. The bases of this argument are that the rate of interest can be treated in the same way as any other cost and that interest rates are subject to the property of cost inflation. Proponents of this argument generally exhibit confusion between the effect

² A.C. Begg, Evidence before Committee, Wellington, 1 November 1971

of interest rate and interest bill on total farm cost. However, in submissions to the Committee of Inquiry into Lending to Farmers recommendations were made that:

- (a) "... powers should be given to temporarily reduce interest rates ... to make units viable ..." (New Zealand Stock and Station Agents Association);
- (b) "... interest rates on farm loans should not exceed 5% in view of ever increasing farming costs ..." (A.C. Maddock - private submission);
- (c) "... low interest rates ... are necessary to control costs and maintain a reasonable profit margin ..." (W.J. Scott - private submission).

- (ii) The National Interest argument. This argument is based on the beliefs that farm production is of vital importance to the economy, and that low interest rates have a direct effect in stimulating production. For example, "... the national interest has justified concessional financing arrangements for the industry ..." (D.R. Byles - private submission).

(iii) The protection argument. Proponents of this argument believe that concessional interest rates to the farm sector must be considered as part of Government's agricultural protection policy. This is particularly as a result of the protection afforded to other sectors through import quotas and tariff barriers. For example, "... there can be no justification for obliging farmers who are in an export industry competing against the wide, wide world to borrow on the same money market with protected local industry ..." (A.J. Coster - private submission).

(iv) The Ownership argument. This is based on the belief that farm ownership is a necessary institution in New Zealand and that the infusion of young operators into the sector does stimulate production (Chapter 18). For example:

(a) "... the availability of the traditional 5 $\frac{1}{2}$ % mortgage for the purchase of a man's farm is of paramount importance ..." (Waikato Provincial District of Federated Farmers);

(b) "... limited availability of capital at reasonable interest rates ... is severely curtailing the intake ... of young farmers ..." (New Zealand Co-operative Dairy Company Ltd.).

- (v) The tradition argument. This is an implicit argument based on the concept that farming has traditionally been financed at concessional rates, and that the status quo should be preserved. For example:

- (a) "... there is little commercial justification for Government's decision to increase interest rates on certain categories of loans ..."
(Waikato Provincial District of Federated Farmers);
- (b) "... we have always considered that interest rates to farming should be reasonable ..."
(A.C. Begg - Verbatim evidence before the Committee).

None of these common arguments are based on a full understanding of the function of interest rates in the general equilibrium system. Disadvantages of concessional rates are that:

- (i) the development of an artificial cost/revenue schedule is more easily facilitated. This is likely to induce an inefficient allocation of resources;
- (ii) lenders to the farm community are discouraged (e.g. 11.18). Interest rate controls in New Zealand have led to the development of alternative rationing devices with consequent problems (14.2);

- (iii) it is not proven that concessional rates significantly influence agricultural production;
- (iv) interest rates are not believed to be major influences on farm sector borrowing decisions (11.9, 12.10).
Rates themselves have limited effects on total farm costs. From Dairy Board data, static point elasticity measurements show that a 1% increase in mean interest rates would lead, *ceteris paribus*, to a 0.12% increase in total farm costs on town milk supply farms, and a 0.1% increase in total costs on cream supply farms³;
- (v) there may be an upward pressure on land values, if concessions of this nature become capitalised.

Despite these comments, a theoretical argument can be propounded in favour of concessional rates (19.3), given certain specified circumstances.

19.3 The Case for Concessional Rates

This argument can be stated within a "second best" equilibrium framework. Consider loanable funds, M , to be allocated to the farm sector at interest rate i_A and to the non-farm sector at interest rate i_B where $i_A < i_B$ for all M . The simplifying assumptions are made that:

- (i) the price mechanism is the only rationing device;

³ Data taken from New Zealand Dairy Board, A Survey of the Economic Structure of Factory Supply Dairy Farms in New Zealand, 1968-69. Vol.6, Wellington: August 1971, p.45.

- (ii) prices are in constant terms;
- (iii) there is underemployment of resources;
- (iv) lender's risk-yield preference is neutral;
- (v) there are no other uses of loanable funds.

The equilibrium condition in the factor market is that the economic rate of return, j , on the marginal dollar allocated to each sector is equated. This is assumed to be where ΔM is allocated to the farm sector and where $(M-\Delta M)$ is allocated to the non-farm sector.

The average economic rate of return, j_A , from funds loaned to the farm sector, ΔM , is given by:

$$j_A = \frac{i_A}{1 + \left\{ \frac{E(y)_A}{\Delta M} \right\}} \quad - \quad (1)$$

where $E(y)_A/\Delta M$ is the mean risk of loss from lending ΔM .

Total Revenue, R , is at a maximum where:

$$R = j_A \cdot \Delta M + j_B (M - \Delta M) \quad - \quad (2)$$

From this allocation of funds, the total output increase, O , will be defined:

$$O = (\Delta O_A + \Delta O_B) \quad - \quad (3)$$

where $\Delta O_A, \Delta O_B$ represent marginal output of farm and non-farm sectors respectively resulting from injection of funds. This funds allocation, as a result of the given interest rate differential, might not necessarily result in final product market equilibrium, in which case:

$$\frac{\Delta O_A}{\Delta M} \neq \frac{\Delta O_B}{M - \Delta M} \quad - \quad (4)$$

Equilibrium in the final product market would require that these variables defined above are of a different magnitude and that:

$$\frac{\Delta O_A^1}{\Delta M^1} = \frac{\Delta O_B^1}{M - \Delta M^1} \quad - \quad (5)$$

where indices reflect changes in the magnitude of variables.

This gives $O^1 = \Delta O_A^1 + \Delta O_B^1$, and it is likely that:

$$O^1 > O \quad - \quad (6)$$

From (6), the implication is that:

$$R > R^1$$

$$\text{where } R^1 = j_A^1 \cdot \Delta M^1 + j_B^1 \cdot (M - \Delta M^1) \quad - \quad (7)$$

The "second best" equilibrium condition may be written as:

$$\lambda X \geq Y \quad - \quad (8)$$

where λ is a product market weighting factor, and

$$X = (O^1 - O), \quad Y = (R - R^1)$$

The "second best" condition may also be written as:

$$\lambda \geq Y/X \quad - \quad (9)$$

The theoretical concept of λ has been discussed (17.1). The implication from (9) is that, ceteris paribus, the larger the interest rate differential between farm and non-farm sector, the larger the necessary value λ . A major problem in the achievement of a second best equilibrium is identification of product market equilibrium at the institutional level. It has also not been conclusively resolved that interest rate concessions do stimulate borrowing and production. Limited evidence suggests that these concessions do not (2.6, 4.4, 4.9). On the other hand, there was some evidence to suggest that interest rates were a mortgage source choice factor (4.6, 4.11).

To attain an equilibrium "second best" state from (8) and (9) above it is necessary for interest rate concessions to have a positive farm production effect. If this condition is fulfilled, then to attempt to achieve equilibrium, a number of policies may be considered. Some have been listed (16.2), and their effect would be to allow the farm sector to compete for funds in the factor market on a more competitive basis through the granting of interest rate concessions at the farm level. This might help to facilitate a closer attainment of equilibrium in the factor market.

If interest rate concessions to the farm sector do not increase output in the final product market, and the lambda effect is not considered important by policy makers, then the "viability" argument is the only economic case for concessional rates. Acceptance of this case would imply the full recognition of interest rate as the closed sectoral price for loanable funds. This price would then be defined as a factor price rather than as an allocative price equating real and monetary factors as in the Keynesian system⁴.

The viability case might appear to have acceptance in New Zealand as a result of restrictions placed on the allocative function of interest rates. Even under these conditions a policy of concessional rates to improve unit viability must at best be a short term measure. This policy would need to be accompanied by

⁴ Keynes defines interest as "the price paid for the willingness to part with cash". For a fuller description of the role of interest in the Keynesian system, see Lutz⁽⁵⁴⁾, Chapter 11.

programmes to restructure the industry and to facilitate fairer inter-sector competition for funds. An extreme variation of this interest rate policy has been suggested to the Committee of Inquiry into Lending to Farmers by the Taranaki Hill Country Committee:

"... loans free of interest and of a suspensory nature are the only forms of lending which would make the farmers again profitable and increase production ..."

The analysis of this section has brought inconclusive results. For the "second best" framework to be useful, information is needed on:

- (i) the practical interpretation of the role of the rate of interest in the farm credit market;
- (ii) the effect of rate variation on the borrowing and production decision.

Given this data, the theoretical framework described does permit an assessment of the validity of the economic case for concessional rates.

19.4 Increasing Use of the Price Mechanism in Resource Allocation?

The leverage effect of changes in interest rate on the relative attractiveness of lending to farmers is high.

Over the last five years an increase in the mean rate of interest charged on farm loans by the three national stock firms would have resulted in an average increase in profit before tax of about 4% for each $\frac{1}{2}\%$ increase in rate (Table 19.1). The effect of an increase in interest rate to equate the lending rate of these stock firms with their average cost of capital (Table 12.8) would have resulted in an average increase in profit of about 10%.

Table 19.1 The Effects on Consolidated Group Profits (before tax) of Increases in Mean Interest Rate charged on Funds Committed to the Farm Sector by the Three National Stock Firms (assuming zero interest rate price and cross elasticity)

<u>y/e</u> <u>30 June</u>	<u>Mean Funds</u> <u>Committed</u> <u>(\$M)</u>	<u>Group</u> <u>Profit</u> <u>(\$M)</u>	<u>1</u> <u>(%)</u>	<u>+$\frac{1}{2}$</u>	<u>+1</u>	<u>+1$\frac{1}{2}$</u>	<u>+2</u>
1966	73.280	10.502	6.0	3.5%	7.0%	10.5%	14.0%
1967	73.406	8.946	6.5	4.1%	8.2%	12.3%	16.4%
1968	78.426	9.387	6.5	4.2%	8.4%	12.6%	16.8%
1969	82.564	10.246	7.0	3.2%	6.4%	9.6%	12.8%
1970	84.325	10.749	7.5	4.1%	8.2%	12.3%	16.3%

Source: publ. Balance Sheet data and pers. comm.

On average, a $\frac{1}{2}\%$ increase in the mean rate of interest on trading bank loans to the farm sector would increase the net worth (see 11.18 for introduction to this concept) of the sector by about 15% (Table 19.2).

Table 19.2 Effect on Net Worth of the Farm Sector of Increases in Mean Rate of Interest on Trading Bank Loans (assuming zero interest rate price and cross elasticity)

<u>Interest Rate Increases</u>	<u>Net Worth Increase (%)</u> (1963-1970 average)	<u>Net Worth Increase (%)</u> (1970)
+ $\frac{1}{2}$	14.8	18.8
+1	29.4	37.6
+1 $\frac{1}{2}$	44.2	56.4
+2	58.9	75.2

Note: figures to one decimal place

Source: Table 11.12, p.309.

In the last year for which full data is available (from Table 11.12), the increase in farm sector net worth would have been 19% for each $\frac{1}{2}\%$ increase in the mean rate of interest (Table 19.2). This percentage increase is greater than the average increase over the period. This is as a result of the continual decline from 1963 of the net worth of the farm sector to the trading banks (Table 11.12).

Despite these potential effects on profit and net worth, there is a reluctance by stock firms, trading banks and other lenders

to use the price mechanism in funds allocation (15.2). This is partly the result of action by the Authorities (14.2). On the other hand, the limited interest return on farm lending has been suggested by some lenders as the factor inducing them to invest elsewhere in the economy. A survey of solicitors, conducted by the State Advances Corporation in October 1971, indicated that aggregate lending by them to the farm sector is likely to decrease as a result of:

"... the high returns which can be achieved through investment in other sectors of the economy ..."⁵

In theory therefore, if the farm sector were to compete for funds on a more equitable basis in the factor market, through the removal of real or imaginary interest rate controls, then it might prove to be a more attractive proposition to lenders. However, freer use of the price mechanism in the farm credit market in New Zealand is considered to be unlikely in the foreseeable future. This is as a result of:

- (i) the acceptance by the Authorities of the arguments for concessional rates (19.1);
- (ii) the present role of Government in resource allocation (14.2, 14.3);

⁵ Agricultural Production Council, Interim Report on the Review of the Sheep Industry, Nov. 1971, op. cit. p.41.

- (iii) inexperience in the use of the pricing mechanism as a funds allocative device in New Zealand;
- (iv) the likely ineffectiveness of the pricing mechanism as a factor influencing the demand for funds (19.3). This thesis has stressed the concept of availability (4.12), and in 1964, the Finance Working Party of the Agricultural Development Conference stated that:

"... a low interest rate is not in itself a major incentive ... other inducements are likely to be more successful in encouraging farm development ..."⁶
- (v) the relatively low impact of changes in interest rate on total cost;
- (vi) hostile reaction from farmers' pressure cells, and the relevance of the "quiet life" doctrine to the behaviour of many lenders. Average pricing techniques are far less susceptible to criticism and accusation from pressure groups than marginal pricing techniques.

⁶ New Zealand, Report on Agricultural Development Conference, Wellington: Govt. Printer, 1966, p.44.

The prophesy above is however a "guesstimate" rather than the result of detailed research. The inconclusiveness of this whole discussion on the rate of interest focusses attention on the volume of research that is necessary in this field. Indeed, considerable research is needed into the whole farm credit market, and some suggestions are made in Chapter 20.

CHAPTER TWENTYSome Needed FutureResearch and Likely Developments20.1 Farm Debt Outstanding

The Department of Agriculture has estimated total farm debt in New Zealand to be \$702m. in 1963.¹ Statistics on the number of farm businesses and bona fide farmers are lacking in New Zealand. 1970 sample survey results are therefore unable to give an accurate approximation of farm debt outstanding but an attempt was made to estimate this, based on the assumption of 45,000 farmers (16.2).

Table 20.1

Estimate of Farm Debt in New Zealand
(as at June 1970 - \$m)

	<u>Low Estimate</u>	<u>Mean Estimate</u>	<u>High Estimate</u>
Mortgage Debt	776.6	879.4	982.2
Stock Firm Debt	65.2	94.0	122.8
Trading Bank Debt	85.9	103.7	121.5
Private Individuals (unsecured)	28.4	50.1	71.8
Total	<u>\$956.1m</u>	<u>\$1127.2m</u>	<u>\$1298.3m</u>

¹ Miller, J.G., op. cit., p. 19.

Notes: (1) excludes hire purchase and dairy company debt;

(2) low and high estimates represent limits of 95% confidence range given by:

$$\bar{X} \pm Z_c \cdot \frac{\sigma}{\sqrt{N}} \cdot \sqrt{\frac{N_p - N}{N - 1}}, \quad \text{in general}$$

and N = sample size, \bar{X} = mean of sample, σ = sample standard deviation,

N_p = population, Z_c = confidence limit.

The distribution of total debt was: Private Individuals (30.8%); State Advances Corporation (22.4%); Trading banks (including term loans) (9.2%); stock firms (8.4%); insurance companies (7.3%) and other (21.9%).

The sample estimate of State Advances Corporation debt outstanding was \$251.3m. Actual rural debt from Corporation records was \$256m. at 31st March 1970, and \$277m. at 18th November 1970. Trading bank advances to agriculture were \$87.5m. in June 1970 and term loans were \$5.7m., a total of \$93.2m. The sample estimate was not significantly different from this population figure, within accepted limits. Stock firm advances were \$112.5m. in June 1970. This includes a small volume of lending to the non-farm sector (e.g. retailers, butchers), but the sample estimate appeared to be low. The mean estimate of insurance company debt outstanding, \$81m., was low compared with the only figure available of insurance company debt, \$130m., in September 1971.²

² Life Officers Assn. of New Zealand, Background Paper on Rural Lending, submitted to the Committee of Inquiry into Lending to Farmers, Wellington, September 1971.

It is likely that the mean estimate is slightly low, but the actual debt is unlikely to exceed the upper estimate. Given the limited information on the number of farm businesses in New Zealand, the sample debt estimate is considered to be acceptable in relation to the limited published information available. It does confirm the use and benefits of the cheap sample survey method of approach to research.

20.2 Future Developments

Brief comments are made that are not necessarily related to previous discussion, but on what are considered to be likely future developments in patterns of New Zealand farm financing.

(a) Term Finance

Provision of term finance to the farm sector shows signs of being increasingly borne by the State, and institutional sources have been reducing their marginal commitment to agriculture.³ With the increasing capital entry requirements (18.2) and the need for the

³ Agricultural Production Council (1968) p. 62.

farm sector to compete for funds in the growing economy, given the institutional identification problem (17.1), the development of a market for farm mortgages seems a logical step (17.3). In the long term these constraints are envisaged to lead to a change in the social attitude towards farm ownership with the consequent development of a "new breed" of professional farm managers.

In the short term the need to attract capital for farm purchase finance is likely to foster the use of policy measures such as taxation inducements to encourage vendor mortgage finance, use of moral suasion techniques on institutions to exhort them to lend on a term basis and an extension of the State's role in farm purchasing. The Mortgage Guarantee Scheme⁴ was designed to ensure lenders against risk of loss of principal and interest. This scheme does not permit investment negotiability and does not ensure that resources are allocated in the factor market to their optimum use. Its main function is to

⁴ State Advances Corporation (Rural Division), Farm Mortgage Guarantees - Lenders Handbook, Wellington, August 1971.

retain funds invested in agriculture rather than attract new sources.

Institutional lending for development and amalgamation purposes is improbable and the State is likely to continue to play the predominant restructuring role.⁵

(b) Short Term Finance

Under present institutional constraints and with diversification of the economy, trading bank lending to the farm sector is unlikely to increase significantly unless there is an increase in farm profitability. With increasing stock firm lateral integration and awareness that farm lending is not directly productive, the rate of increase in farm lending is likely to decline. These factors are resulting in increasing use of farm budgeting, rigid limits, security registration and stipulated balance adjustments.

⁵ The role of restructuring is borne by the State in all major agricultural nations. For brief details of some policies see Bureau of Agric. Economics, (166) 152-164.

(c) New Developments in Farm Financing

The financing of agriculture has traditionally offered comparatively low returns to the lender as well as a low negotiability and liquidity element. For any increase particularly in the flow of short term funds to agriculture, these elements must be assessed by policy makers. Given that interest rate controls are an irreversible policy aim, "net worth" is the logical allocative device (11.18, 12.17).

Developments to improve the negotiability element of short term finance might include:

- (i) increasing use of the refinance long term lending facility, particularly through the Government lending agency;
- (ii) increased control by lenders over the use of their funds, as in (b) above. This is because "hard core" debt is in many cases a function of slack control;
- (iii) the development of a more sophisticated debt collection service utilised by lenders;

- (iv) increasing use of term loans (11.21), given some relaxation of financial controls.

Other methods of farm financing are developing that attempt to fulfil the requirements above. These include stock leasing and the development of machinery syndicate and farm contractor financing. The economics of these finance innovations are needed areas of research.

20.3 Future Research

This study has highlighted the volume of future research necessary in this field. A number of possible studies are briefly listed. The list broadly follows chapter subject matter.

- (i) the economics of farm business cash withdrawal, to identify conceptually and empirically, average and marginal "propensities to withdraw", and the simulated effects on farm business growth of variations;⁶
- (ii) psychological and social research into the farm firm in the fields of investment theory, farm

⁶ Some simulation work has been carried out on the effects of variable withdrawal functions. See Smith, A., and Baker, C.B. "Optimum Growth Plans for Grain Farms in Central Illinois Using Alternative Land Financing Strategies". A Statistical Summary: University of Illinois Agr. Exp. Sta. AERR 96, December 1968.

firm utility, and the role of information,⁷
with its associated diffusion effect;

- (iii) the relationship of farm firm goals to farm firm behaviour through the development of a more formal predictive behavioural economic model;
- (iv) differences in the use of and availability of loanable funds in farm businesses by farm managers compared with owner occupiers;
- (v) detailed study of the firm growth, output and performance of farmers who have financed businesses entirely from equity;
- (vi) the economics of and effects on farm growth and capital flow of table mortgages compared with flat mortgage financing and mortgages of variable term structure;
- (vii) the economics of farm purchase and the reasons

⁷ Exploratory work in this field in New Zealand is being undertaken by Manning, E.W. "The Modernisation of Agriculture on the Heretaunga Plains", Ph.D. thesis in progress, Dept. of Geography, Victoria University of Wellington, 1971.

for farm borrowing, where ex-ante perceived productivity is at variance with price;

- (viii) the factors which facilitate the flow of seasonal debt into hard core debt, and the effects on funds allocation;
- (ix) the use and possible uses of dairy company finance in the farm business;
- (x) the economics of private finance in agriculture;
- (xi) economic predictions and conceptual definitions of capital expenditure (based on factors such as existing stock of capital assets, farm income, confidence, age structure ,as per Chapter Eight);
- (xii) the use of decision theory in determining actual and optimum farm asset purchase. Considerable research is also needed on the ex-post outcome of projects;
- (xiii) the reasons for limited use of marginal pricing, and the real costs of lending, in an institutionally constrained environment;

- (xiv) simulation to determine optimum resource allocation by institutions, under various market conditions (e.g. interest rate constraints; use of net worth allocation; limited information; capital indivisibilities);
- (xv) the role of tradition and past history as a loanable funds allocative device;
- (xvi) the identification of opportunity costs of funds allocation;
- (xvii) the role of interest rates to the farmer, and to the lender. The effect of a dynamic allocation system based solely on pricing;
- (xviii) simulation of the effect of lending policies under full use of the net worth concept to both lender and borrower;
- (xix) the economics of the stock firm security device and in particular its effect on farm profit maximisation;
- (xx) the asset creation effect of farm borrowing;

- (xxi) a simulation study of the operator age structure on farm productivity, assets committed to agriculture and debt structure;
- (xxii) the economics of an ageing or increasingly youthful farm population;
- (xxiii) a theoretical and empirical study of the "second best" equilibrium concept, and in particular the relevance of the lambda concept (17.1);
- (xxiv) through a simulation exercise the effect of a changing price level and cost structure on the burden of debt;
- (xxv) the economics of a farm mortgage market;
- (xxvi) the simulated effects (and policies to solve) the institutional identification problem in the full equilibrium system, as per Chapter 18.

In addition the study has now provided some basic parameters for an econometric approach to the demand for and supply of loanable funds to the farm sector. Demand parameters to be tested might include farm income, age and education structure of ~~the~~ farm population,

"availability" of funds and farmer "confidence". The interest rate factor might be included but evidence from this study suggests that it is of secondary importance. Since the "availability" of funds was shown to be of considerable relevance, the demand-supply system may be considered to be interdependent. The alternative rate of return available might be investigated as an exogenous supply factor. Aspects of the net worth concept such as deposit generation or volume of trading business would need to be considered. In the provision of term finance, the predetermined funds allocated to the leading Government agency will complicate any model formulation.

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APPENDIX A - FLOW OF FUNDS STATEMENT

(SOURCES OF DATA AND METHODS OF CALCULATION)

1. Gross Farm Income

Statistics were taken directly from annual copies of the New Zealand Year Book. They were available for all years.

2. Livestock Inventory Changes

The gross farm income figures include an allowance for livestock valuation changes. This capital element is inconsistent with the selected funds definition (1.2) and must be deducted from (1) above. Estimates calculated as follows:

Period 1945/6 - 1962/3;	Figures as supplied by the Government Statistician.
Period 1963/4 - 1966/7;	Figures as calculated by <u>A.E.R.U., Lincoln College</u> (unpubl. working papers).
Period 1967/8;	Figures calculated in accordance with previous consistent method. The method is based on changes in numbers, multiplied by pre-determined (livestock) standard values.

3. Intra-Sector Sales

Gross farm income statistics include
 "..... that portion of farm produce
 which is sold to other farmers as
 material for further production....."¹

It will include intra-sector sales of hay, grass seed, wheat and barley, but intra-sector transfers of livestock are specifically excluded from the published statistics. The intra-sector sales figure is included in the published gross income figure of "Grain and Field Crops" defined in the Year Book. It is necessary to exclude a portion of this component, since it is neither a sector source or use of funds.

¹ New Zealand Year Book, 1966, p. 387.

II

Much of the intra-sector data is not available directly and there will be annual variation, depending on climatic and other factors. The approach adopted was therefore to attempt to isolate inter-sector sales of grain and field crops and estimate the intra-sector component as a residual. Data was readily available from 1961/62, and estimates were made of inter-sector sales as follows:

- (i) Cereals - Purchases of wheat, barley, oats and maize for grain milling, animal and fowl feed and malting by industry, were taken from Industrial Production Statistics. Purchase of New Zealand farm output of cereals was calculated net of imported grain. Figures of these purchases were taken from New Zealand External Trade Reports. Figures for imports were given on a c.d.v. valuation basis. These figures were adjusted upward by 20% to give a c.i.f. valuation.
- (ii) Peas - Figures are available from Industrial Production Statistics for:
 - (a) total fresh vegetables purchased by the vegetable processing industry (quantity and price);
 - (b) production of canned and frozen peas. Peas accounted for about 50 per cent of both input and production of the industry (No. 216). Crude estimates were therefore made of the purchase price paid by processors for farm peas.
- (iii) Potatoes - Annual production statistics were taken from the New Zealand Year Book, and an average gross margin figure for each year from relevant copies of the Lincoln College "Farm Budget Manual". Assuming that all potato production was sold outside the farm sector, an estimate of dollar sales was made.
- (iv) Onions - Production statistics were taken from the New Zealand Year Book. Prices received by farmers were estimated from:
 - (a) a series of wholesale onion prices,² and by
 - (b) discussion with G.W. Kitson, Horticultural Economist, A.E.R.U. Lincoln College.

² New Zealand Vegetable and Produce Growers Assn., Report on the Economic Position of the Fresh Vegetable Industry in New Zealand, 1965, p. 67.

III

- (v) Hay Sold Commercially - Estimates of the acreages of grass cut for hay and silage were taken from the Year Book. Estimates of production per acre and figures of average returns were taken from Lincoln College Farm Budget Manuals. A value estimate of hay produced on a market price basis was calculated. Assuming that 20 per cent of hay produced is sold commercially, an estimate can be made of inter-sector hay sales.
- (vi) Grass Seeds Exported - Figures of the value of grass seed exports were taken directly from annual New Zealand Trade Reports.
- (vii) Flax - Estimates were obtained from Industrial Production Statistics, of green flax purchased for Phorium Flax Processing (Industry 262) and for Linen Flax Processing (Industry 263).

Items (i) to (vii) were added for the respective years, and represent inter-sector sales of "Grain and Field Crops". A number of small items have been omitted e.g. sale of grass seed for the private lawn market, sale of maize for starch etc., as data was not available. These are likely to be small.

The inter-sector sales as a percentage of total receipts from sale of "Grain and Field Crops" was calculated. This percentage, approximately 50%, was applied to the whole series, except for the years 1945/46 and 1946/47, when 65% of such income was assumed to represent external sales. During those years, tobacco, orchards and market produce were classified with "Grain and Field Crops", as "Agricultural Production". Earlier data was not sufficiently comprehensive to test the accuracy of this assumption.

4. Sector Consumption of Farm Products

Notes accompanying annual Gross Farm Income Statistics in the Year Book comment that "... no attempt has been made to exclude from the scope of compilations that portion of marketable farm produce which may be consumed on the farm...". The note continues: "... products of kitchen gardens and of activities more intimately associated with the home rather than the farm do not come within the ambit of the statistics...".

IV

It is therefore necessary to deduct an allowance for sector consumption of meat, potatoes, eggs and milk. The period 1961/62 to 1967/68 was chosen as a base (as statistics were fully and readily available) to measure an approximate percentage of gross farm income represented by sector consumption. Estimates were made as follows:

(i) Meat

Industrial Production Statistics give a figure for "tons of meat slaughtered on farms". This figure has been used to represent farm consumption of meat. It is likely to be an understatement of real consumption. The Production Statistics also give figures for:

- (a) Tons of lamb, mutton, beef and beef products, pig meat and veal produced by the meat freezing and preserving industry. No figures are available for tons of meat bought. It is assumed that farmers consume meat in the proportions of final processed output, i.e. sheep meat is the most important product processed and also consumed on farms.
- (b) Total sum paid by processors for purchases of lamb, sheep, cattle, pigs and calves.

Dividing (b) by (a) a rough estimate was obtained of the purchase price of each meat per ton, or sale price by farmers. This figure has been used as the basis of valuation of farm meat consumption. It is clearly an over-estimate, as there will be wastage in processing.

For each variety of meat a percentage was taken of the "tons slaughtered on farms" figure, based on (a) above, and multiplied by the estimate of sale price. A rough monetary estimate was therefore obtained of farm meat consumption. This fluctuated with prevailing prices, though it is likely that real consumption would not change significantly from year to year.

(ii) Milk, Potatoes and Eggs

Monetary estimates of consumption were made by:

- (a) estimating numbers in farm families. Figures of those employed as "Farmers and Farm Managers" were extracted from the 5-yearly Censuses and linear interpolations assumed between years. It was assumed that there were four consumers in each family.

- (b) extracting consumption of milk, potatoes and eggs per capita from annual Year Books.
- (c) extracting retail prices of these commodities from Retail Price Lists in the respective Year Books.
- (d) estimating from (a), (b) and (c) a monetary value of farm consumption of these products. To the extent that retail prices represent an over-estimate of the real cost of the produce to the farmer, and the farm sector deviates from per capita consumption habits, these estimates will be incorrect.

Adding (i) and (ii) a monetary estimate of sector consumption of farm products is obtained under the assumptions listed. For the base period this represented an annual average of $1\frac{3}{4}\%$ of total Gross Farm Income. This rule-of-thumb has been used for the whole period 1945/46 - 1967/68, and the limitations of the method have been recognised.

5. Farm Cash Receipts

Represent Gross Farm Income as per published statistics less non-cash components as per estimates above.

6. Farm Cash Expenses

These were taken from series estimated by Hussey and Philpott (1968). The items included were: farm requisites; fertiliser; lime; seeds imported; fuel; oil and greases; electricity and power; repairs and maintenance; railage and cartage; other inputs; wages, interest (bank and stock firm only); rent; rates and land tax. Deducting farm cash expenditure from farm cash receipts, the item "Net Cash from Farm Operations" is obtained.

7. Off Farm Income

Income Tax Statistics were the basic source of data. These have been published according to:

- (i) Assessment years 1946/47 - 1949/50.

⁴ Assuming that all rent is paid outside the sector.

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- (ii) Income years 1949/50 onwards.

No details of off-farm income have been published for the income years 1955/56 and 1961/62, and these figures were imputed by means of weighted averages.

The statistical series are not consistent. Up to the income year 1956/57 a figure of "unearned income" is given for the farm sector. From 1957/58 more comprehensive figures are given of off-farm income. They are classified according to "other income", "income taxed at source", "non-assessable income", "universal superannuation", "assessable⁵ dividends", "non-assessable income" and "estate income".

Estimates have had to be made of total off-farm income for the income years 1946/47 to 1956/57 by adding:

- (i) the figure "unearned income" given in the published Income Tax Statistics.
- (ii) the difference between the figures of "Returnable" and "Assessable" income given. The difference was assumed to represent non-assessable income.
- (iii) Before 1957/58, figures for farm sector "unearned income taxed at source" and universal superannuation have not been given. These items represent an average of 45% of total off-farm income since that date. (i) and (ii) have therefore been raised by a factor of $(\frac{100}{55})$ to give an approximate consistent and comparable estimate of total off-farm income for the period.

8. Farm Sector Income

Represents the net cash generated from farm sector operations together with the non-sector income accruing to farmers.

9. Tax Paid

The basic source of data is the Income Tax Statistics. "Income tax assessed" figures are given for farmers, and in addition, Social Security charges of farm companies. The assumption is that income tax assessed in any one income year is paid in the subsequent farming year. This is reasonable since tax cannot

⁵ For definitions see Income Tax Statistics 1957/58.

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properly be assessed until the actual income figure for any one farming year is known.

For the income year 1957/58 only a figure of total taxable income is given. Bearing in mind changes in tax rates, an approximate tax assessed/taxable income ratio was calculated and applied to the 1957/58 figure.

No income tax statistics at all have been published for the income year 1961/62. To estimate assessed tax for this year a weighted average ratio of "tax paid" to "farm sector income" was calculated for the previous and subsequent two years, and applied to the 1961/62 farm sector income figure. This tax was assumed to be paid in the 1962/63 farm year.

10. Government Grants, Subsidies, Etc.

These have been taken from the "Farming" Sections of the annual Year Books. The grants are those given directly to farmers, rather than to Pest Destruction Boards and other sundry agricultural concerns. The items included are:

- (i) subsidies for the carriage of lime;
- (ii) subsidies for the transport of fertiliser;
- (iii) payments for flood and drought relief;
- (iv) other, e.g., compensation for the eradication of bovine T.B., compensation for stock losses etc.

In addition the item includes an allowance, where statistics are available, of insurance benefits received by farmers (e.g. for fire losses etc.) taken from Insurance Statistics.

Subsidies given for river control and for soil conservation are not included.

11. Wool Retention Money

All the data has been taken from the New Zealand National Income and Expenditure Accounts 1966/67, Table 4, p. 9.

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12. Gross Mortgage Borrowing

Statistics were taken of the number and value of rural mortgages registered from respective copies of the Year Book. These were classified as "country" mortgages up to 1964, and as rural mortgages from that date. The statistics will include the dollar value of all new mortgages registered and the re-finance of existing ones.

13. Net Short Term Borrowing (also Net Short Term Repayments)

Figures of short term advances were collected for:

- (i) Trading Bank Advances - The source of data was the Reserve Bank of New Zealand Monthly Bulletin. For the period 1945/49 figures of rural advances outstanding have only been given as at 31st March. These were adjusted to a June basis, through use of a linear trend and a seasonal index calculated for the rest of the data. Since 1958 advances outstanding have been given for the first or second week of July. This was assumed to be equivalent to the 30th June. Up to June 1956 no distinction was made between advances to the farm sector direct, and advances to "farm services, forestry, hunting and fishing". In June 1956 these advances stood at \$2.1 million. It was assumed that they had grown at the rate of \$0.1 million p.a. up to that date. This calculated figure has been deducted from total figures.
- (ii) Trading Bank - Term Loans - Figures have been published in the Reserve Bank Monthly Bulletin since 1964. The figures for the farm sector include loans to "farm services" etc. Farm service loans have been recorded only as at the March balance date between 1964 and 1968. At these dates they represented approximately 30% of term loans to the farm sector. A deduction of 30% from the June (or early July) figures has been made to represent net term loans to the farm sector proper.
- (iii) State Advances Corporation - Advances on Current Account - Figures were taken from the Corporation's Annual Accounts, of the debit balances on current account. This balance includes R.I.C.A. loans outstanding, though for the year ending 31st March 1969 these loans have been included in the figure for "stock loans". To obtain a net debit figure of short term advances accruing to the Corporation, credit balances (i.e., amounts owing by the Corporation to farmers) have been deducted.

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(iv) State Advances Corporation - Other Rural Investment

The items taken from Annual Reports of the Corporation include advances under the Agricultural (Emergency Powers) Act 1940, s.40, the Farm Loan Emergency Regulations 1940, and the Rural Housing (Emergency Scheme). The major item is advances under the Rural Housing Act (1959), and these have been increasing rapidly in recent years. Short term advances to Crown tenants by the Department of Lands and Survey⁶ have also been included. All advances from the Marginal Lands Board, even if made on a current basis, have been included under the heading "Gross Mortgage Borrowing" above.

(v) Loans from Finance Companies

Statistics of Finance Companies were first published in the Reserve Bank Bulletin in 1965. Figures are given for purchases of agricultural machinery and equipment.

(vi) Advances from Stock and Station Agents

Figures for stock firm advances to farmers have been collected and published in the Reserve Bank Bulletin since 1958. They were substantially revised in content and coverage in March 1962, and direct comparison between the two series is not possible. Advances are currently classified according to:

- (a) unsecured advances on current account;
- (b) other advances (secured). This figure includes stock firm mortgages which Miller in 1963 estimated to be 2% of the value of total mortgages outstanding. A figure representing 2% of total mortgage volume registered each year has been calculated and deducted from (b) above. (a) and (b) (adjusted) thus indicate stock firm advances outstanding.

Before 1958 no information is published on stock firm advances to farmers. Efforts to obtain these figures from the records of the leading stock firms themselves were unsuccessful. However in the period for which data is available on both stock firm and bank lending a relationship was noted. From 1958 the ratio of

⁶ Taken from Annual Reports of the Department.

⁷ Miller, J.G., op. cit., p. 19.

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bank advances outstanding to stock firm advances outstanding was plotted. The regression equation has the properties:

- (i) $X = 124.400 - 2.649 T$ where X = the ratio of trading advances outstanding to stock firm advances outstanding
 $T = \text{Time, } 1958 = 1.$
- (ii) Regression coefficient significant at 1%.
- (iii) $R^2(XT) = .877$; $R(XT) = .937$.
- (iv) d-statistic = .9167; insufficient observations to test for auto-correlation of residuals.

This equation has been used to calculate the level of stock firm advances outstanding before 1958. The method is recognised as crude, both statistically and conceptually, but in the absence of data was practical. A small check was available. The Secretary of the New Zealand Stock and Station Agents Association has estimated that total advances to farmers by Stock Firms were "not⁸ less than \$40 million" for the year ending 30th June 1955.

This compares with the regression estimate of \$46 million, which is within the 99% confidence limit of his figure.

Items (i) - (vi) were added, and first differences taken. An increase represents net short term borrowing and a decrease net short term repayment.

14. Funds from Sector Balances (also Funds to Sector Balances)

(a) Bank Deposits

From 1961 statistics are available from the Reserve Bank Bulletin in May and November for:

- (i) demand deposits of dairy farmers;
- (ii) demand deposits of other farmers, including farm services etc.

⁸ In evidence given before ⁽¹⁷⁰⁾, p. 325, para. 344, B3.

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(i) has been adjusted by linear interpolation to give a figure for June deposits. The result is consistent with observed phenomena.

A deduction from (ii) was made of estimated bank deposits accruing to "farm services, forestry etc., mining and quarrying". These were a small proportion of the total as:

- (a) most of the forestry industry deposits are classified under "Manufacturing Industry". The figures above represent deposits of small timber firms;
- (b) mining and quarrying is a small sector of the economy, in both output and as a source of employment;
- (c) deposits of farm services are likely to be small and act as a "contra" to farmer deposits.

The assumption was made that "farm service" deposits represent 1% of total bank demand deposits and fluctuate with total deposits, rather than "farming" deposits. They thus represent approximately 5% of "other farming deposits".

Before 1961, all farm bank deposits were estimated. From November 1961 a strong correlation (coefficient of .9401) was noted between changes in farmers' deposits and changes in total demand deposits. This is reasonable as farmers' deposits are a volatile component of total deposits. The response of total bank deposits is relatively greater when farm deposits are falling than when they are rising. The suggestion is that farmers have a "stock" level of deposits. When incomes are rising, cash is diverted to other purposes than bank balances. When incomes are falling farmers continue to draw on their bank balances to at least maintain essential expenditure.

With this limited information, farmers' balances prior to 1961 were estimated by assuming that:

- (i) in periods where total bank deposits were rising, farm deposits were rising at a rate of 20% of the total rise;
- (ii) in periods where total bank deposits were falling, farm deposits were falling at a rate of 30% of the total fall.

⁹ After discussion with several Christchurch Bank Managers.

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This naive estimation technique should be recognised as such.

(b) Deposits with Stock and Station Agents

From June 1957 figures are published in the Reserve Bank Bulletin for both deposit and current account balances with stock firms. All deposits are assumed to accrue to the farm sector and particularly to sheep farmers. From available data a correlation (.778) was noted between farmers' current account balances as at 30th June, and their income from sales of wool, lamb and mutton during that farming year. The balance is an average of 11.5% of sales for the year ($\pm 1.9\%$ at 95% confidence limits). The assumption was made that this relationship could be extended ex-post, in order to estimate current account balances before 1957.

Deposit account balances stood at \$4.7 million in June 1957. The assumption was made that the development of the deposit account facility arose as a result of inflated incomes and liquidity from the early 1950's and that deposit account balances were negligible before June 1951.¹⁰ A linear interpolation was therefore utilised between 1951 and 1957. Little error is likely to result from this crude measure in view of the magnitude of figures involved.

Items (a) and (b) were added, and first differences taken. An increase represents an entry in the "funds to sector balance" row, and vice versa for a decrease. As no data was available, balances with dairy companies have been assumed to be zero on an accrual basis.

15. Purchase of Farm Assets

The items "Purchases of Plant and Machinery", "Constructions of Buildings" and "Improvements and Developments" have been taken directly from Johnson (114). Most of the items classified as "improvements and developments" by Johnson are tax deductible against current operating profit. In accordance with accepted

¹⁰ Discussion with Christchurch Stock Firm Managers.

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funds-flow principles the item has been classified as a separate use of funds on the grounds that such expenditure is in practice often postponable.

For the item "Purchase of Land" the data source was the Rural Land Transfer Statistics published in the New Zealand Year Book and covering the whole period. These statistics relate to transfer of land on sale. They do not include transfer of land from trustees to beneficiaries or to new trustees, transfers of mortgage, easements etc. They do include transfers from father to son, where say no cash is involved and as a result may introduce an upward bias to estimated cash purchase of land.

16. Mortgage Repayment

The item includes both repayment of principal and interest, though interest payments are tax allowable as a current operating expense.

Information on repayments is not published. Miller¹¹ has estimated that repayments (excluding interest) totalled \$16.6 million in 1963. The structure of her questionnaire suggests that this is likely to be a gross under-estimate. Poole⁽¹⁷⁹⁾ has estimates of principal repayments to Trustee Savings Banks, Insurance Offices and the State Advances Corporation between 1956-60.

Statistics are available from 1953 in the Year Book on the classification of rural mortgages (according to "table" or "flat") and interest rates on first flat and first table mortgages. From 1953 flat mortgages have represented an average of 41% (+ 9.5% at 95% confidence limits) of total new rural mortgages registered. There was no overall trend. This average has been assumed to be relevant for earlier years. The differential in interest rate between table and flat mortgages was approximately $\frac{1}{2}\%$ from 1953. Assuming that this relationship held before that date, and using "average" rural interest rate figures published before that time estimates have been made of the average interest rate on new table and flat mortgages prior to 1953.

Repayments have been calculated as follows:

(i) Table Mortgage Repayments

The average length of table mortgage was assumed to be 25 years after:

¹¹ Miller, J.G., op. cit., p. 19.

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- (a) examination and reconciliation of published figures for mortgages registered with mortgages discharged. A correlogram was drawn and the 25 year period correlation coefficient of raw data was .435. This was appreciably higher than for other selected time periods (for instance .353 for a 20 year period, and .186 for a 30 year period);
- (b) detailed study of the average length of new State Advances Corporation rural mortgages;
- (c) correspondence with leading insurance companies.

With the calculated table mortgage interest rate series (adjusted to the nearest $\frac{1}{2}\%$) principal and interest payments have been estimated for the period from Amortisation Tables. A lag of one year has been assumed between the granting of the mortgage and the first repayment. The last repayment of a table mortgage registered in 1921 will therefore be made in 1946. The effect of the Mortgagees and Lessees Rehabilitation Act (1936) has been allowed for on the interest rate series.

(ii) Flat Mortgage Repayments

The average length of flat mortgages has been assumed to be five years after:

- (a) study of the stock-type data in Miller's survey;
- (b) study of published figures of mortgages registered and discharged. The five year period correlation coefficient on raw data was .555;
- (c) study of flat mortgage data arising from the Lincoln College Farm Credit Survey.

The assumption is that estimated or actual average interest is paid annually over the five year period, after which time the debt is discharged. Figures of land purchase and repayments are gross. The case is automatically included where flat mortgages are re-financed. Annual calculations of (i) and (ii) were added together to give an estimate of "Mortgage Repayments".

17. Death Duty and Gift Duty Payments

For the calendar years 1966 and 1967, analysis was made in the Year Book of deceased persons' estates by occupation. Tables give classification according to occupational group and to number of estates in specified ranges. It was possible to calculate death duties paid by "farmers and farm managers". These were approximately 45% of total duties paid for these two years and this does

correspond with Keen's (118) estimate that "... just over half of the total estate duty comes from farmers' estates...". Attempts were made to calculate farm sector death duties using published information on gross estate assets for earlier years. This approach proved unsuccessful, and a "50% of total duties paid" rule-of-thumb method was adopted to calculate these payments.

Figures are published in the Year Book for gift duty paid. There is no further breakdown. An arbitrary assumption was made that 66% of all gift duty paid will originate from the farm sector. This is a reasonable assumption as the farm sector possesses assets of high capital value and also faces a progressive estate duty structure.

APPENDIX B: FARM CREDIT SURVEY - SELECTION OF SAMPLE

The selection of the sample was made in three stages:-

- (i) selection of counties;
 - (ii) selection of address lists of holdings within counties;
 - (iii) selection of holdings from address lists.
- on (i) An initial non-random list of counties was prepared that would typify in the broadest possible sense, the entire range and variety of New Zealand farming. Background studies were made of literature pertaining to New Zealand topography, climate and soil type. In addition, closer study was paid to county performance tables in the Department of Statistics annual Farm Production Statistics, since 1960/61. The list was subjected to criticism and comment by members of the Farm Management Department and Agricultural Economics Research Unit at Lincoln College. Some adjustments were subsequently made. A list of 22 counties was decided upon, in which three (Vincent, Akaroa and Clutha) were in the final event excluded on grounds of cost.
- on (ii) A list of the number of holdings¹ as at June 30th 1970 in the selected counties was obtained from the Government Statistician. Examination of the budget constraint and cost estimates² suggested that a 2% sample of holdings in each county would be feasible. It was decided to use a constant sampling fraction as the simple holding address was the prime sampling unit. In any case there was insufficient additional information available to adopt a more sophisticated technique efficiently. Some adjustments were made to this sampling fraction on grounds of cost, and to ensure an equitable distribution of interviews between interviewers. In particular this meant that Marlborough county was over-sampled, and Southland and Ellesmere Counties were both under-sampled. The average sampling fraction turned out to be .0193 for all counties.

¹ For a full definition of "Holdings" in this context, and as used in the Survey, see Dept. of Statistics, Farm Production Statistics 1967/68.

² Prepared from Pilot Survey of 50 farmers in Oxford County.

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Address lists were provided by the Department of Statistics who matched for each county a set of given random numbers with their records, according to certain specified rules.³ Approximately three times the number of addresses were supplied than were required in the interviewer quotas. This was to allow for rejection and replacement. Two features of this selection process were:-

- (a) the supply of addresses in batches of ten following the Department's reconciliation of its reference number with a given random number. This was largely to facilitate administrative and time problems in the Department. It was considered unlikely that the procedure would cause any significant bias though⁴ some geographical and name clustering⁵ was apparent;
- (b) the use of farm type minimum restrictions. Government Departmental regulations limited the direct supply of information to address lists only. A problem of random sampling is the selection of "untypical" elements, for example, the selection of a dairy farm in a predominantly sheep farm area. This problem had been experienced in both Department of Agriculture Surveys.⁵ By placing a minimum farm type requirement for each county it was hoped to overcome this possible source of error. In the event of the farm type minimum restriction not being met, the Department were instructed to substitute addresses, following the given procedure.

on (iii) Interviewers were given address lists and their quota lists to be completed at a final briefing session. They were at liberty to choose their interviewees from the lists provided. They were instructed to make primary contact with respondents in two stages:-

- (a) by sending a signed Lincoln College headed letter and survey information sheet, (Appendix H), giving the selected respondent several days notice of the intention to visit him;

³ The procedure was similar to that adopted by the Dept. of Agriculture in their 1964 and 1968 Credit Surveys.

⁴ In cases where the Department's Address Lists were held in alphabetical order.

⁵ Personal communication; Dept. of Agriculture.

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- (b) by telephoning to arrange an actual mutually convenient appointment. Both these approaches would result in some losses of potential interviewees. 443 names and addresses were approached in this way, and 381 interviews completed. Analysis of primary contacts not subsequently interviewed is shown below.

Reasons for Primary Contacts not Being Interviewed

Refused co-operation outright	20
Addressee retired/dead	12
Addressee "too busy"	8
Addressee on holiday	6
Sharemilker	6
Other (e.g. addressee in hospital)	10
	62
	—

It was considered that these losses would be unlikely to cause any significant bias. An exception is the 20 farmers (or 4.5% of total primary contacts) who refused co-operation outright. This compares favourably with the Department of Agriculture loss of 9%.⁷ The majority of these unco-operative farmers were old, and likely to be fairly conservative in their financial habits.

381 interviews were completed out of a planned quota of 385. These four interviews were not completed at the time of deadline for field work, and analysis had to proceed without them. It was considered unlikely that this small quota loss would cause any noticeable bias in the final assessment.

Of 381 interviews completed, 368 contained full information to enable complete computer analysis to be carried out. The 13 questionnaires rejected contained limited or no financial information, though in all cases the rest of the questionnaire was complete. In eight of these incomplete cases farm accounts were not available either at the farmer's home or his accountant's office though the farmer would have been willing to show them. In two cases the farmer had commenced business within the year and only five farmers refused to show their accounts at all. This 1.3% refusal rate would be likely to bias results to some extent but the effect was considered to be minimal.

⁶ In the interviewer's terms of reference sharemilkers were not specifically excluded. This instruction was misunderstood by one interviewer. It was not corrected until after he had completed about 20 interviews.

⁷ Miller, J.G., op. cit., p. 12 (1964 Survey).

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The method of selecting respondents from address lists by the interviewers themselves inevitably meant that a completely random sample of any county would not be made. In view of the cost and time saved, and ease of planning itineraries such a procedure facilitated, it was considered that this deviation from strict sampling theory could be justified. The difficulty of reconciling time and costs with pure sampling theory was apparent at all stages of planning.

FARM CREDIT SURVEY - SAMPLING FRACTIONS

County	Farm Type ¹ Minimum Restriction	Holdings Jun. '70	Interview Quota	Interviewees Approached	Interviews Completed	Actual Sampling Fraction (f)	(1-f)
Hobson	50% of Types 2, 6 or 7	856	18	23	18	.0210	.9790
Rodney	50% of Types 4, 5 or 10	865	17	22	17	.0196	.9804
Piako	50% of Type 1	1,656	31	40	30	.0181	.9819
Tauranga	50% of Types 1, 4, 6 or 10	1,452	23	25	22	.0151	.9849
Waitomo	50% of Types 2, 6 or 7	863	16	18	16	.0185	.9815
Cook	50% of Types 2, 6 or 7	815	14	18	14	.0171	.9829
Hawkes Bay	50% of Types 2, 6 or 7; 15% of Type 14	1,572	32	41	32	.0203	.9797
Dannevirke	50% of Types 4, 6 or 10	714	14	19	14	.0196	.9804
Egmont	50% of Type 1	603	12	13	12	.0199	.9801
Hawera	50% of Type 1	463	9	10	9	.0194	.9806
Manawatu	50% of Types 4, 6 or 10	685	14	16	14	.0204	.9796
Masterton	50% of Types 2, 6 or 7	602	12	14	12	.0199	.9801
Waimea	50% of Types 2, 6 or 7; 20% of Type 14	1,434	29	31	27	.0188	.9812
Marlborough	50% of Types 2, 6 or 7	801	24	25	24	.0299	.9801
Waipara	50% of Types 2 or 11	361	7	7	7	.0193	.9807
Ellesmere	50% of Types 11, 12 or 13.	666	9	10	9	.0135	.9865
Ashburton	50% of Types 11, 12 or 13	1,607	32	35	32	.0199	.9801
Waimate	50% of Types 2, 6 or 7	880	20	21	20	.0227	.9773
Southland	No restriction	3,806	52	55	52	.0136	.9864
Totals			385	443	381	Average = .0193	

¹ For farm type definition see Table 3.5.

APPENDIX C: FARM CREDIT SURVEY - QUESTIONNAIRE DESIGN AND
SURVEY ORGANISATION

A highly structured questionnaire was used. Out of a total of 163 questions, 134 were precoded and 29 were open-ended. Thirty-six questions were compulsory. In addition 12 compulsory background information questions were asked and eight separate items of information taken from the "most recent copy" of the farmer's balance sheet and accounts. 57% of accounts¹ shown covered the year ending 31st March or 30th June 1970. In 43% of cases previous years accounts were shown. This was largely because current accounts were not yet available. The most out of date accounts examined covered the year ending 31st March 1969, though these were relatively few, 8% of the total. A number of farmers produced a series of accounts extending back over a period of years. This information would have proved a useful supplement as part of a dynamic study to complement the cross-section nature of the survey data. In most cases the information was not collected as it was not specifically in the interviewer's brief to do so.

The structuring of the questionnaire arose as part of a two-stage process:-

- (i) Formulation of questions and discussion of likely anticipated response with officers of two stock firms, three trading banks, the State Advances Corporation and the Department of Agriculture all in Christchurch and with members of the Lincoln College academic staff.
- (ii) The testing of this partly structured questionnaire in a full scale Pilot Survey in Oxford County. The results and organisation of this survey have been discussed elsewhere.² The Pilot Survey facilitated preparation of a more realistic coding structure, and in particular highlighted those questions where pre-coding would not be useful. As a result of this survey changes were made to the questionnaire design. The pattern of farming in Oxford County was hardly typical of New Zealand as a whole and allowance was made in the design of the final questionnaire for the post-coding of answers possibly arising from other areas

¹ In a small number of cases farmers produced accounts ending at other times of the year, particularly April and May. These were adjusted to the nearest quarter. The loss of accuracy resulting from this adjustment was considered to be insignificant.

² Summarised in Stanbridge, R.J., Report on Pilot Survey (Oxford County) Lincoln College, July 1970 (mimeographed-internal circulation only).

or types of farming in New Zealand. Many of the answers in Oxford County proved to be typical of the rest of the country, and little post-coding work needed to be carried out. None of the results of the Pilot Survey have been incorporated in the final analysis.

Seven student interviewers were selected from a large number of applicants. Each carried out approximately 55 interviews. Attempts were made to choose students of as wide a social and academic background as possible, subject to a basic sound level of agricultural and farm management knowledge. Four degree students, of which one was a female, and three Dip. V.F.M. students were selected. This diversity was an attempt³ to reduce the "gross" and "net" interviewer effects to a minimum.

Each interviewer received a full training session, covering all aspects of the questionnaire design and layout, as well as advice on the more practical aspects of survey field organisation. Each interviewer subsequently made a thorough study of the questionnaire and problems were discussed. As a final control each interviewer accompanied the author on two test interviews - one carried out by the author, and one by the interviewer in the author's presence. Both sets of answers for each interview were compared and discussed. The second interview was dispensed with in the case of two V.F.M. students, both of whom had had some interviewing experience in the course of their training. Several of the respondents in these test interviews were specially selected by the Farm Advisory Service of Lincoln College. These results were not subsequently analysed on the computer.

Design of the questionnaire was such that in no interview was every question asked. The use of "skipping" devices meant that the interviews took between $\frac{1}{2}$ and $1\frac{1}{2}$ hours. Many farmers were prepared to talk for much longer. An innovation in the questionnaire was the use of the "showcard" or "checklist" technique. This⁴ concept has been developed, discussed fully and used by Stewart. Eight showcards were used in 12 largely

³ Hyman discusses these concepts in further detail. He refers to the gross interviewer effect as "the deviation of responses recorded by the interviewer from the true response" and the net effect as "the difference between the distribution of responses obtained by one or more interviewers and the true distribution of responses for the population interviewed". Hyman argues that since errors in opposite directions may cancel each other out, the net effect may be negligible or absent, even when a considerable gross effect occurs. See Hyman, H.H., and Assocs; Interviewing in Social Research, Chicago: Univ. of Chicago Press, 1954.

⁴ (46) p. 414.

motivational questions. The use of the technique, briefly, was that a respondent was asked a question and his spontaneous answer noted in words. The showcard was then presented, and the respondent asked to indicate any additional answers that were applicable. Experience on the pilot survey indicated that the technique could have been used on more questions, though its efficiency would have been impaired as the farmer became over-familiar and possibly irritated by a continual presentation of cards. Following Stewart, two sets of cards were used for alternate farmers, with reverse order. This was an attempt to reduce possible bias from reading.

To coincide with the commencement of interviewing some national publicity was carried out. A five minute interview was broadcast nationally on "Country Calendar". Details of the Survey were given over the national news, and a progress report was broadcast over the same medium at a later date. Newspaper reports appeared on the farming pages of eight regional newspapers. Reports of the survey also appeared in the New Zealand Journal of Agriculture,⁵ and Straight Furrow.⁶ Both these reports appeared after the majority of field work had been completed. The major effect of this background publicity was indirect in that it did stimulate farmers into awareness that "something was on". From interviewer's reports, few farmers could accurately remember what they had heard or read. The role of the information bulletin was thus of crucial importance in presenting the selected farmer respondents with survey background material.

Completed interviews were returned six at a time to Lincoln College by post. They were then checked manually for errors and minor adjustments and corrections were made. Data was punched and verified by two separate machine operators and as a final control on accuracy a computer programme was written to check for inconsistencies.

All eligible data was analysed by specially written computer programmes. These programmes gave totals, averages and standard deviations of data classified in numerous contingency tables. They also tested the significance of some relationships through the Chi-Square and F-test statistics. A temporary research assistant was employed. She carried out further analysis of computer data and the preparation of graphs and charts. She was also responsible for the analysis and summary of all uncoded open-ended questions. This research worker prepared

⁵ Dec. 1970, p. 40.

⁶ Vol. 20, No. 27, (2 December 1970), p. 5.

a report on her work and four interviewers also prepared reports on their interviewing experiences and difficulties. These were taken into account in the final assessment.

Survey Cost

The budget limit for direct survey field work and analysis was \$4,000. This excluded printing, secretarial and postage costs incurred as necessary preparation and also any allowance for computer charges. \$1,000 was provided as a grant from the New Zealand Bankers Association, and individual grants were received from the three leading stock firms amounting to \$1,000. Interviewers were paid at the rate of \$1.25 an hour for all time directly spent on survey work. They received reimbursement at the rate of 6¢ a mile for travel whilst on survey work, and on production of receipts, refund on a "reasonable and actual" basis for the cost of meals and overnight board. A straight allowance of \$3 a day was made in cases where receipts were not produced. The research assistant was paid at the rate of \$1 an hour. Analysis of the final direct costs indicates the following breakdown.

	<u>Cost</u>	<u>% of total cost</u>
Interviewers wages	1,197.23	30.61
Research Assts. Wages	<u>403.50</u>	<u>10.31</u>
Total wages	1,600.73	40.92
Total Mileage	1,108.98	28.35
(incls. \$179.50 inter-island fares)		
Accommodation and meals	978.88	25.02
Computer Services	147.00	3.75
Postage and Telephone	59.96	1.53
Other allowable expenses	<u>15.39</u>	<u>0.43</u>
	<u>\$3,910.94</u>	<u>100.00</u>

No allowance has been made for the author's remuneration as this was not restricted by the budgetary constraint.

APPENDIX D:- FARM CREDIT MARKET INVESTIGATION
(TRADING BANKS QUESTIONNAIRE)

I Market Structure

- (i) How many farmers operate a trading account with...?
- (ii) Does the distribution of farmers vary according to farm type, age, geographical region etc?
- (iii) What proportion of
 - (a) all trading accounts and
 - (b) farmers trading accounts were in overdraft December 1970/y/e December 1970?
- (iv) Are these proportions increasing/decreasing/constant?

II Market Conduct (Structural Characteristics)

(a) Product Homogeneity

- (i) Is \$1 of loanable funds to one borrower the same as \$1 to another? If not, why not?
- (ii) Is the effect of advertising to foster product heterogeneity?
- (iii) At which sections of the market is bank advertising aimed?
- (iv) In what sort of ways do banks compete with each other for
 - (a) deposit business and
 - (b) lending business?
 How does this affect farmers?
- (v) Is any advertising aimed specifically at farmers?

(b) Attitude of Buyer Towards Seller

- (i) Is there loyalty shown towards the bank by
 - (a) farmers;
 - (b) other sectors?
- (ii) Is farmer loyalty greater/less than that exhibited by other sectors?

(c) Freedom of Entry and Exit

- (i) What has been the effect of "non banks" on your bank's business?
- (ii) Is there freedom of entry to the market? i.e. will a completely new entrant with an equivalent project to one already in the market be just as likely to obtain funds? Will this vary according to sector?
- (iii) IF "NO" to (ii). What are the requirements for entry for
 - (a) the farm sector;
 - (b) other sectors? (e.g. age, experience etc.).
- (iv) Is there freedom of market exit? Do banks try to retain profitable overdraft business?

(d) Information - Sellers

BACKGROUND

- (i) Is there any information available on your manager's
 - (a) education;
 - (b) experience in dealing with the farm sector?
- (ii) What is the bank's staffing policy?
- (iii) What rural education is given to managers by the bank?
- (iv) Is this enough? Would the bank be prepared to pay for more training?
- (v) Are bank managers given similar training in dealing with other sectors? Is this 7L than that given to them re-the rural sector?
- (vi) Do bank managers really need "lengthy experience" for maximum efficiency?
- (vii) What kinds of published information on the farm sector is utilised by the bank at
 - (a) head office and
 - (b) branch level?
- (viii) Is this information sufficiently prompt?
- (ix) Are there additional sources of background information required?
- (x) If there were these sources would the bank be prepared to pay for them?

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- (xi) How does this rural sector published information compare with that of other sectors?

SPECIFIC

- (xii) When considering a request for an overdraft within the farm sector, what information is requested? What effect does a client's past history have on interpretation?
- (xiii) Is there any additional information ideally required that would be useful in assessing applications?
- (xiv) How does farm sector information compare with information available from other sectors? Which sector has the least information available and which the most?

(e) Information - Buyers

- (i) Do farmers have any knowledge on what they can borrow from other banks/financial institutions?
- (ii) Do they have more/less information than that utilised by other sectors?
- (iii) Do farmers as a whole know the cost of credit from various sources? How does this compare with the knowledge of other sectors?
- (iv) Which sector would have the most market knowledge? and which the least?
- (v) Do bankers have a psychological advantage over the farmer, compared with their advantage over other sectors? Does this vary according to social/geographical environment?

(f) Market Separation

- (i) Does the tier system have the effect of isolating the markets for bank loans? Do bank managers think along these lines? Would markets be separated without this legislation?
- (ii) How are tier targets meted out in practice at
 - (a) head office;
 - (b) branch level?
- (iii) Is there separation within markets, i.e. do some farmers have an elastic demand, and others inelastic?

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- (iv) What is the effect of personal contact and past history in isolating sub-markets? Is this a stronger influence in the farm sector than in others?
- (v) Does the separation of sub-markets (if any) depend on the availability of alternative finance sources?
- (vi) What is the effect of possible alternative sources on the banks? Do banks try to court loan business at the expense of stock firms? Do they have information on borrowings from firms? How do they obtain this information?
- (vii) Are costs of administration higher or lower for split level business within the farm sector, compared with all borrowing through the bank? If so, what costs and why?
- (viii) Has the farm sector as many alternative sources of short and medium term credit as other sources? Is the farm sector forced to the bank?

(g) Trade Amongst Buyers

- (i) Would costs of lending be higher/lower if money was lent directly to farmers, rather than via stock firms?
- (ii) Is it efficient for banks to lend in this two stage process?

III Market Conduct (Pricing)

(h) Direct Cost of Loanable Funds

- (i) Does the bank have any concept of its cost of capital?
- (ii) What is the current cost of attracting term deposits? How has this cost changed in recent years?
- (iii) Is there a cost in retaining current account balances from other uses? If so what cost? How has this been changing in recent years.

(i) Direct Incidental Cost

- (i) What costs are involved that are specific to a loan? - servicing, control, inspection, advisory, checking? Can and are these quantified?
- (ii) Do costs increase with size of loan? Are they greater/lower on average in the farm sector than in other sectors? If so, why?

- (iii) Is much use made of other banking departments by farmers (e.g. overseas department), in relation to other sectors? How are charges imposed? Do they cover costs?

(j) Risk Cost

- (i) How is risk defined and measured by the bank? What sort of information is taken into account when assessing the risk of a loan?
- (ii) Is the farm sector "riskier" than others? Why? What sector is the riskiest to lend to? and what sector is the safest?
- (iii) Is there any relationship between increasing risk and increasing loan size?
- (iv) How precise are ex-ante estimates of risk? Is any comparison made between ex-ante risk assessment and ex-post eventuality? In what sectors are the best estimates of risk made? And in what sectors are the worst? Why?
- (v) What additional information would help to reduce risk in the farm sector?

(k) Opportunity Costs

- (i) What sector of the economy is the most profitable to the bank? Why? How does the agricultural sector rate? How has it changed?
- (ii) Is there a cost in increasing loans to the most profitable sector? How is this expressed?

(l) Loan Pricing

- (i) What are the range of interest rates currently in force for
- (a) all sectors;
 - (b) the farm sector;
 - (c) the most risky sector;
 - (d) the least risky sector?
- What are the mean rates, and modal rates?
- (ii) Is the demand for loans interest elastic
- (a) in all sectors;
 - (b) in the farm sector?
- What sectors exhibit greatest/least elasticity, and why?

- (iii) Is the demand for loans interest elastic within the farm sector? What factors encourage such a phenomenon?
- (iv) Is there a cost of unused limits? Is this charged for? Does the effect of working under different limits impose different costs?
- (v) Is interest charged on whole loans or outstanding balances? Are there different ways of charging for different sectors - or within a sector?

(m) Marginal Cost Pricing

- (i) For the same loan, with the same risk, would the same price be charged for
 - (a) all clients;
 - (b) all farmers?
- (ii) Are separate prices charged for separate services? Do some sectors receive more services than others? Do separate service fees accompany loans? Would borrowers pay these fees? Would they lead to a more efficient allocation of funds?
- (iii) Are different prices charged for first and subsequent loans? Are there differences between/within sectors?
- (iv) Are prices varied according to demand? According to seasons? Do other sectors show similar seasonal flows to the farm sector? Is this reflected in pricing?
- (v) Are price allowances made according to geographical areas?
- (vi) Is the risk inherent in every loan reflected in the price
 - (a) between a sector;
 - (b) within a sector basis?
- (vii) How quickly do trading banks adjust interest rates to changing conditions? Are they altered within the conduct of a loan? Does the necessity for rapid adjustment mean that bankers will "opt out" and merely charge by rule of thumb?
- (viii) If yes to above, what criteria are used? Do these vary from sector to sector?
- (ix) To what extent is security a rationing device in
 - (a) the whole market;
 - (b) the farm sector?
 What security laws have been developed? Is security variation a more important factor than interest rate variation?

- (x) What other factors are used in funds rationing?
How do these vary from sector to sector.

IV Market Performance (Impediments to Efficiency)

(n) Adjustment of Reserve Ratios

- (i) How does this affect the trading banks?
How does it affect the security of their advance structure?

(o) Interest Rate Restrictions

- (i) Do restrictions mean that there will be more applications - and declines for loans than otherwise?
Does this vary from sector to sector?
- (ii) What would be the equilibrium rate of freely floating? Do the restrictions mean that credit-worthy customers are charged more, and uncreditworthy customers charged less?
- (iii) Are there restrictions on interest paid on deposits?
What has been the effect? If these restrictions were lifted, what sectors would benefit?
- (iv) How have the interest rate restrictions facilitated the development of quasi-financial institutions?
What effect has this on the farm sector?

(p) Medium and Long-Term Loans

(1968 B.N.Z. Report - banks "forced out" of this lending).

- (i) Is medium term lending part of the bank's role?
What sectors would the banks move into if controls were lifted?
- (ii) To what extent would they move into agriculture?
Why? Are there differences in relative costs both to and within different sectors in lending on a longer term?

(q) The Tier System

- (i) To what extent does the system lead to a distortion of resource allocation? How does this affect agriculture?
- (ii) If there were no controls, what would be the pattern of resource allocation?

- (iii) Has the tier system achieved "desired" effects?
What are these effects?
- (iv) What technical difficulties are involved in trying to maintain the system?
- (v) What sectors are discriminated against?
Has the system had the effect of turning these sectors away from the banks?

V Market Performance (Actual Market Data)

(r) Savings Banks

- (i) How far have government restrictions limited loans to
 - (a) all sectors;
 - (b) the farm sector?
- (ii) On what criteria are loans made to each sector?
On what terms are they made?
- (iii) What are the costs of making loans and how do they vary between sectors?
- (iv) Is there an over/under demand for these loans
 - (a) by all sectors;
 - (b) by the farm sector?
- (s) Advances Data /similar questions asked for limits/.

(Published data indicates:

- (1) Drop in proportion of loans accruing to agriculture.
- (2) An increase in the proportion accruing to manufacturing.
- (3) Little change in other proportions, over past 10 years).
- (i) Is this a fair indication of the changes in relative profitability. What are (your bank's) figures - are they significantly different from the aggregate?
- (ii) How far are changes a result of
 - (a) changing sector profitability;
 - (b) bank policy;
 - (c) government controls?
 What is the effect on agriculture of government controls?
- (iii) Is there a declining role, in real terms, in the bank finance of agriculture (suggested by published data)?

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(t) Deposits

(Published data indicates:

- (a) drop in farm sector deposits;
- (b) increase in deposits of services;
- (c) relatively little change in other sector deposits).

- (i) Why have these changes occurred? How do (your bank's) figures differ from the aggregate?
- (ii) Do declining farm balances mean that the farm sector is becoming relatively more unprofitable to trading banks?
- (iii) Are there costs involved in changing seasonal balances? How does this affect loan profitability?

(v) Term Loans

- (i) What criteria are used in term loan allocation? Is there a need for this type of finance? Is there an excess demand
 - (a) from all sectors;
 - (b) from agriculture?
- (ii) What is the scope for increasing term loan type finance?
 - (a) to all sectors;
 - (b) to agriculture.

APPENDIX E:- TRADING BANKS - MARKET PERFORMANCEAdvances

A time series flow of changes in trading bank lending to agriculture since 1957 is shown in Graph E.1.

The compound rate of increase in trading bank advances to agriculture between December 1957 and December 1970 has been at 3%, compared with a compound rate of 4.9% for all advances. Based on ~~deseasonalised~~ data, advances to the agricultural sector have fallen from 16.2% of total advances outstanding in December 1957 to 12.9% of the total in December 1970.

Farm sector advances have increased from a ~~deseasonalised~~ figure of \$55.1m. in December 1957 to \$81.2m. in December 1970. A three year moving average (Graph E.1), indicates the rate of change, with seasonal and random effects eliminated. Following an actual decline in the mid-sixties, the rate of increase has accelerated as the farm sector has made increasing demands on external capital. This has been accentuated as a result of the discriminatory effects in favour of the farm sector of the tier system of monetary control (11.8). The compound rate of increase in farm sector advances since July 1965 when this target system was first introduced, has been treble the rate of the previous five years (Table E.1). This table indicates the extent to which funds have been channelled into "priority" sectors.

Table E.1.

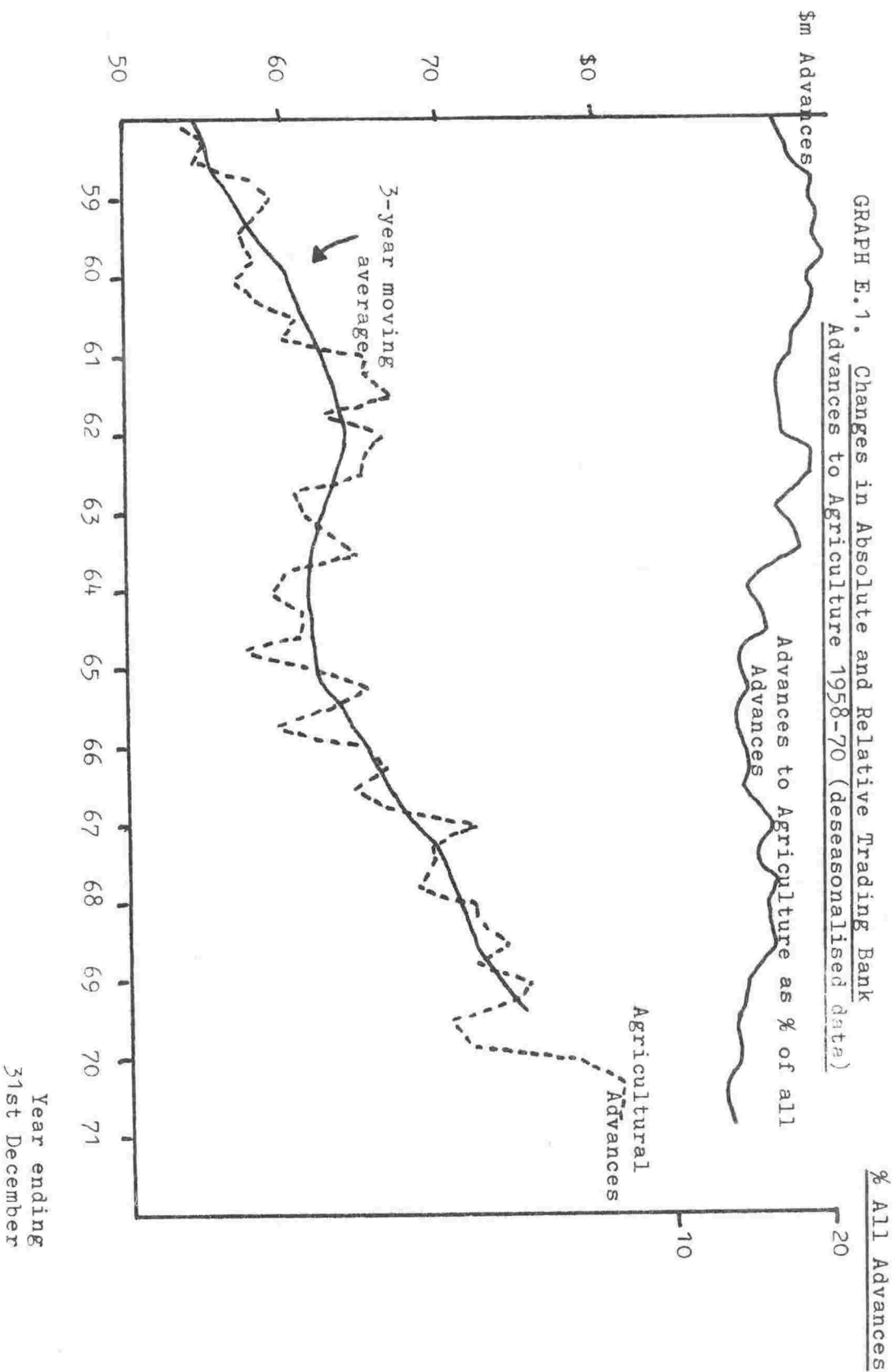
Compound Annual Percentage Rates of Increase
in Advances Outstanding, 1960 - 65 and 1965 - 70 (July Years)

	<u>1960 - 65</u>	<u>1965 - 70</u>
Upper tier advances*	8.1	11.0
Lower tier advances*	6.7	2.9
All advances	7.1	5.9
Agriculture	2.1	6.0

* for definitions, see 11.8.

¹ Earlier figures were estimated to allow the trend line to commence at December 1957.

GRAPH E.1. Changes in Absolute and Relative Trading Bank
Advances to Agriculture 1958-70 (deseasonalised data)



Even so, the proportion of upper tier advances accruing to the farm sector has fallen from 41% in July 1965 to 32% in July 1970. This fall has been offset by an increase in the proportions accruing to the "freezing works, meat company" sector, and to the "special export" category.

The trend line (Graph E.1) removes the seasonal variation pattern in advances (Table E.2). For farm types listed this variation corresponds well with Credit Survey results (Table 5.11). However, examination of these quarterly seasonal indices over the period indicates that for each farm type classification, the within-seasonal variation was not a significant factor compared with the between-season variation (F-test analysis of variance).

Table E.2.

Seasonal Indices of Agricultural Advances
(1957 - 1970 Calendar Year Data)

<u>Reserve Bank Classification</u>	<u>March</u>	<u>June</u>	<u>September</u>	<u>December</u>
Mainly dairy	94.2	102.8	104.7	98.2
Mainly sheep	94.6	92.0	106.9	106.5
Other farming	98.0	94.2	102.5	105.4
Agriculture*	95.4	96.9	104.7	103.0

* excludes hunting, fishing and forestry.

Limits

Published data on overdraft limits shows that there has been little change in the proportion of total overdraft limits accruing to the farm sector. This has remained constant at about 13% since January 1960 when information on limits was first published. As the proportion of advances outstanding to the farm sector has been historically greater than this figure (Graph E.1), the "intensity of use" of overdraft limits is higher in the farm than in the non-farm sector (Table E.3).

Table E.3.

Mean "Intensity of Use" and Variation Around
Mean (Overdraft Limits, January and July Data, 1960 - 70)

	<u>January Data</u>	<u>July Data</u>
Farm sector	75.3 (3.7)	74.4 (2.6)
Non-farm sector	58.0 (4.2)	61.2 (4.4)
All sectors	59.9 (3.9)	62.6 (4.0)

(Standard deviations in parentheses)

From January data, the farm sector has on average been borrowing 75% of its limit allowed. For both sets of data the use intensity is significantly higher in the farm than in the non-farm sector (t-test, significant at 1%). Limits themselves are dynamic and there was not a significant difference between January and July use intensities.

Whilst the proportion of farm sector overdraft limits to the aggregate has not fallen, the farm sector's proportion of upper tier limits has been declining. From 1965 to 1970 all limits have increased at an annual compound rate of 3.1%. Upper tier limits have increased at an annual compound rate of 6.9% and lower tier limits at a rate of 1.3%. The annual compound rate of increase in farm sector limits has been 3.9%.

Farm Sector Deposits

There has been a fall in farm sector deposits both absolutely and relatively since 1961 when figures were first published. Based on May figures, when farm deposits have traditionally been at a maximum, farm sector demand deposits have fallen from 22% (1961) to 14% (1971) of the total. This represents a money fall of from \$120m. in May 1961 to \$93 m. in May 1971,² or an average compound rate of decrease of 2.8%.

² These figures include deposits of "fishing, forestry and hunting sectors". These are likely to be small.

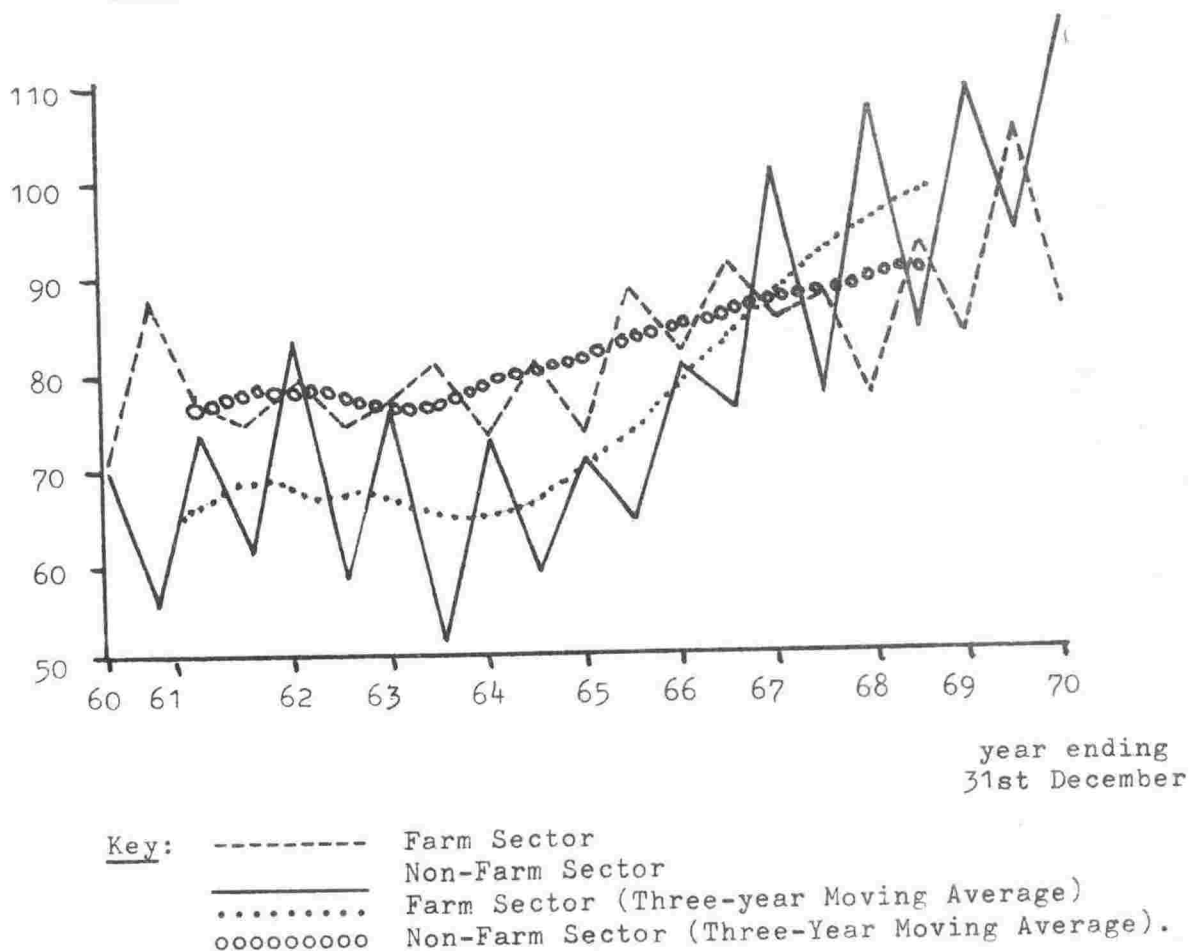
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Movements in the advance-deposit ratio (Graph E.2) show that the historical norm is for the farm sector to be a net lender to the rest of the economy, i.e. the sector has an advance-deposit ratio of less than 100.

Graph E.2

Changes in Advance/Demand Deposit Ratios
(1960 - 1970)

Advances/Deposit
Ratio



In recent years the farm sector has become a net borrower, and the three year moving averages indicate that the sector is now a heavier borrower, relatively, than the non-farm sector. The aggregate non-farm sector ratio combines the ratios of many sub-sectors, such as manufacturing (Ratio of 571, November 1970), the personal sector (34) and the services sector (19). There are therefore wide variations, and these are also reflected in net worth calculations (Table 11.11). However the trend is clear that the deposit backing to farm sector advances has been decreasing at an accelerating rate.

Term Loans

The nature of term loans has been briefly discussed (11.21). The distribution of loans to July 1971 (Table E.4) highlights the historical importance of loans for meat hygiene purposes.

Table E.4.

<u>Distribution of Term Loans</u> (July figures)								
<u>Sector</u>	<u>1964</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>
Agriculture	17	15	8	9	14	18	22	23
Manufacturing	47	40	24	19	16	18	17	23
Other sectors	36	20	12	13	13	13	12	13
Meat hygiene	-	25	56	60	57	51	49	40
	100	100	100	100	100	100	100	100
Outstanding Loan (\$m)	7.7	9.7	17.4	20.4	22.8	24.2	23.9	23.9

The proportion of farm sector term loans to ordinary overdraft has increased from 2% in July 1964 to 6.5% in July 1971. This compares with an increase of from 1.8% to 3.4% for the non-farm sector. Term loans have not been of sufficient dollar volume to assess full impact on farm financing patterns.

Lending in Relation to Gross National Product Contribution

In contrast to the relative decline of agriculture as a recipient of trading bank loanable funds in recent years, the proportion of aggregate funds lent to the sector, in relation to its contribution to Gross National Product, has been increasing. (Table E.5). The ratio is still less than unity indicating that trading bank advances to agriculture are still not at parity with

agriculture's contribution to Gross National Product. The table shows that the farm sector was "overlent" in the late nineteen forties, when the economy was in a lower level of sophistication, and "underlent" in the nineteen fifties when farm incomes and expectations were generally buoyant.

Table E.5

Relative Reliance of the Farm Sector on Bank Credit Compared with its Contribution to Gross National Product

Year Ending	Gross (1) Farm Income (\$m)	Gross (2) National Product (\$m)	(3) Ratio of (1) to (2)	Bank (4) Advances to Agric. (\$m)	Total (5) Bank (\$m) Advances	(6) Ratio of (4) to (5)	(7) Ratio of (6) to (3) (Reliance Ratio)
31/3							
1946	196	799	24.5	39.4	114.1	34.5	1.41
1947	215	857	25.3	44.0	143.4	30.7	1.21
1948	259	964	26.9	40.7	182.6	22.3	0.83
1949	288	978	29.4	39.0	175.2	22.3	0.76
1950	348	1,101	31.6	34.7	186.8	18.6	0.59
1951	529	1,396	57.9	38.6	258.0	15.0	0.26
1952	473	1,446	32.7	43.4	355.3	12.2	0.37
1953	501	1,517	33.0	41.1	273.2	15.0	0.45
1954	539	1,681	32.1	49.8	291.9	17.1	0.53
1955	558	1,860	30.0	59.1	360.4	16.4	0.55
1956	556	1,965	28.3	57.0	352.0	16.2	0.57
1957	599	2,061	29.1	49.7	328.7	15.1	0.52
1958	598	2,184	27.4	53.6	351.2	15.3	0.56
1959	571	2,270	25.2	59.8	352.3	17.0	0.67
1960	609	2,434	25.0	57.1	337.3	16.9	0.68
1961	616	2,623	23.5	65.2	406.0	16.1	0.69
1962	600	2,723	22.0	66.8	421.8	15.8	0.72
1963	639	2,921	21.9	61.5	405.0	15.2	0.69
1964	736	3,196	23.0	59.7	434.2	13.7	0.60
1965	785	3,487	22.5	62.7	465.6	13.5	0.60
1966	836	3,744	22.3	65.3	476.5	13.7	0.61
1967	831	3,886	21.4	72.5	482.1	15.0	0.70
1968	820	4,055	20.2	72.0	487.5	14.8	0.73
1969	868	4,341	20.0	75.7	545.0	13.9	0.70
1970	915	4,757	19.2	78.0	580.2	13.5	0.70

Source of Gross National Product Data: New Zealand, National Income and Expenditure, 1968-69
 Dept. of Statistics, March 1970.

APPENDIX F:- LINCOLN COLLEGEFARMER ATTITUDE CREDIT SURVEY

Name of Farmer (No Punch)

Address

..... (No Punch)

Interview Number (2)

Interviewer Number (1)

Region Number (1)

County Number (3)

Date of Interview (6)

Show Card (1)

Type of Farm (2)

BACKGROUND INFORMATION (AS AT JUNE 30TH 1970)

1. Total Area of Farm (6)

Area in clean pasture or crop (6)

Area in native pasture (6)

Area ungrazed (6)

2. Number of sheep grazed (5)

Number of dairy cattle (4)

Number of beef cattle (4)

Number of pigs (4)

Value of Livestock (6)

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3.	Govt. Valuation of Property (6)
	at (4)
4.	Initial Value of Mortgage (6)
	Amount outstanding (6)
5.	Maximum overdraft from bank (5)	.....
	Maximum overdraft from stock firm (5)	.....
	Private money used in business (5)	.....
6.	Gross Sales (6)	.....
	Net Profit (6)	.....
	Drawings (6)	.....
	for year ending (6)	.....
7.	Balance sheet/imputed value of plant and machinery (6)	.....
8.	Current Assets (6)	.....
	Current Liabilities (6)	.....
9.	Equity ratio (4)	.....
	Net Profit/Sales ratio (4)	.....
	Net Profit/Total assets ratio (4)	.....
	Current Assets/Current Liabilities (4)	.....

SECTION 1 THE FARMER

1.1 Status of Respondent

Farmer	1
Partner	2
Manager	3
Other (Interviewer Specify)	4

1.2 Number of years in Farming on Own Account

0 - 5	5
6 - 10	6
11 - 20	7
21 - 30	8
30 and above	9

1.3 Number of Years on this Farm

0 - 5	10
6 - 10	11
11 - 20	12
21 - 30	13
30 and above	14

1.4 Age of Farmer

Under 20	15
21 - 30	16
31 - 40	17
41 - 50	18
51 - 60	19
60 and over	20

1.5 (a) Number of Children

(b) Number of Sons

	(a) <u>Children</u>	(b) <u>Sons</u>
0	21	27
1	22	28
2	23	29
3	24	30
4	25	31
5 & over	26	32

1.6 Have you attended Secondary School?

Yes 33

No 34

1.7 Have you attended Farm Training School or Technical Institute?

Yes 35

No 36

1.8 Have you attended University?

Yes 37

No 38

1.9 Do you belong to any farm improvement club, livestock breeding club, farmer discussion group, or anything of that sort?

Yes 39

No 40

1.10 Have you received any farm management advice in the last year from the Department of Agriculture, University or any other official source?

Yes 41

No 42

1.11 Do you budget at all as part of your farm management practice?

Yes - budgets drawn up by advisors 43

Yes - budgets drawn up by self 44

No 45

Don't know 46

CODES 47 - 50 SPARE

SECTION 2 LONG TERM DEBT

2.1 Have you a mortgage owing on the property at the present time?

Yes 51

No 52

IF "NO" GO TO 2.12

2.2 Have you more than one mortgage outstanding on the property at present. If so, how many?

1 53

2 54

3 or more 55

2.2(a) What is the initial amount borrowed on the mortgage(s)?

1st (NO PUNCH)

2nd (NO PUNCH)

3rd (NO PUNCH)

2.3 Can you tell me who the source of the mortgage finance is?

	<u>1st</u>	<u>2nd</u>	<u>3rd</u>
State Advances Corporation	56	65	74
Marginal Lands Board	57	66	75
Vendor	58	67	76
Solicitor	59	68	77
Insurance Company	60	69	78
Private Individual	61	70	79
Trading Banks/Trustee Savings Banks	62	71	80
Other (specify opposite)	63	72	81
No Answer	64	73	82

2.4 Can you tell me the purpose of the mortgage?

Purchase of Land	83	88	93
Refinancing existing mortgage	84	89	94
Development of Property	85	90	95
Other (specify opposite)	86	91	96
No Answer	87	92	97

2.5 Was any security offered apart from land?

	<u>1st</u>	<u>2nd</u>	<u>3rd</u>
Yes	98	101	104
No	99	102	105
No Answer	100	103	106

(IF "YES" SPECIFY OPPOSITE)

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2.6 Is the mortgage flat or table?

	<u>1st</u>	<u>2nd</u>	<u>3rd</u>
Yes	107	111	115
Table	108	112	116
Don't Know	109	113	117
No Answer	110	114	118

2.7 What is the rate of interest on the mortgage?

4% and under	119	126	133
$4\frac{1}{4}$ - 5%	120	127	134
$5\frac{1}{4}$ - 6%	121	128	135
$6\frac{1}{2}$ - 7%	122	129	136
7% and over	123	130	137
Don't Know	124	131	138
No Answer	125	132	139

2.8 (a) What is the term of the mortgage?

(b) How long ago was it first raised?

(INTERVIEWER: NOTE YEAR OPPOSITE)

	(a) Term			(b) <u>First raised</u>		
	<u>1st</u>	<u>2nd</u>	<u>3rd</u>	<u>1st</u>	<u>2nd</u>	<u>3rd</u>
5 years and under	140	148	156	164	172	180
6-10 years	141	149	157	165	173	181
11-15 years	142	150	158	166	174	182
16-20 years	143	151	159	167	175	183
21-25	144	152	160	168	176	184
26- years (incl. indefinite)	145	153	161	169	177	185

	(a) <u>Term</u>			(b) <u>First raised</u>		
	<u>1st</u>	<u>2nd</u>	<u>3rd</u>	<u>1st</u>	<u>2nd</u>	<u>3rd</u>
Don't Know	146	154	162	170	178	186
No Answer	147	155	163	171	179	187

*2.9 Can you say why you borrowed when you did?

(INTERVIEWER: USE SHOWCARD 1)

	1st		2nd		3rd	
	<u>S</u>	<u>ASC</u>	<u>S</u>	<u>ASC</u>	<u>S</u>	<u>ASC</u>
Farm became available	188	199	210	221	232	243
Interest rates were low	189	200	211	222	233	244
Sufficient deposit	190	201	212	223	234	245
Expected farming to be prosperous in future	191	202	213	224	235	246
At right age to borrow	192	203	214	225	236	247
Wanted to expand business	193	204	215	226	237	248
)	194	205	216	227	238	249
) DO	195	206	217	228	239	250
) NOT	196	207	218	229	240	251
) RING	197	208	219	230	241	252
)	198	209	220	231	242	253
Other Answers	197	208	219	230	241	252
Don't Know	198	209	220	231	242	253

2.10 Did you try to borrow money from other sources
apart from? (INTERVIEWER SPECIFY)

	<u>1st</u>	<u>2nd</u>	<u>3rd</u>
Yes	254	257	260
No	255	258	261
No Answer	256	259	262

* IF YES: Why did you eventually borrow from the source
you did?

* IF NO : Why did you borrow from the source you did?

	<u>1st</u>	<u>2nd</u>	<u>3rd</u>
Not enough security for other sources	263	274	285
Low interest rates	264	275	286
Favourable terms given	265	276	287
Source had good reputation	266	277	288
Money readily available	267	278	289
Source met my needs best	268	279	290
)			
)	269	280	291
) DO			
) NOT	270	281	292
) RING			
)	271	282	293
)			
Other Answers	272	283	294
Don't Know	273	284	295

*2.11 Do you have any criticisms of
(INTERVIEWER SPECIFY) in your dealings with them?

(INTERVIEWER: USE SHOWCARD 2)

		<u>1st Mort.</u>		<u>2nd Mort.</u>		<u>3rd Mort.</u>	
		<u>Source</u>		<u>Source</u>		<u>Source</u>	
		<u>S</u>	<u>ASC</u>	<u>S</u>	<u>ASC</u>	<u>S</u>	<u>ASC</u>
Slow/poor service		296	307	318	329	340	351
High security		297	308	319	330	341	352
High interest rates		298	309	320	331	342	353
Not enough money lent		299	310	321	332	343	354
Institution interfered in running of my business		300	311	322	333	344	355
No criticisms at all		301	312	323	334	345	356
)						
	) DO	302	313	324	335	346	357
	) NOT						
	) RING	304	315	326	337	348	359
)						
Other Answers		305	316	327	338	349	360
Don't Know		306	317	328	339	350	361
2.12	Have you ever had a mortgage on this property?						
	Yes				362		
	No				363		
2.13	Do you think that it is at all likely that you will be borrowing (long-term) mortgage money in the foreseeable future?						
	Very likely				364		
	Likely				365		
	Possibly				366		
	Unlikely				367		
	Very unlikely				368		
	Don't Know				369		

IF "UNLIKELY" OR "VERY UNLIKELY" GO TO 2.18

- 2.14 If you were to borrow mortgage money, do you think you would try to use the same source that you are using at present/any of the sources that you are using at present?

	<u>1st</u>	<u>2nd</u>	<u>3rd</u>
Yes	370	373	376
No	371	374	377
Don't Know	372	375	378

- *2.15 IF "NO" TO ANY SOURCE IN 2.14 ONLY

Can you say why you don't think you would be borrowing money on a long term basis again from?
(INTERVIEWER SPECIFY)

	<u>1st Mort. Source</u>	<u>2nd Mort. Source</u>	<u>3rd Mort. Source</u>
Once and for all source	379	389	399
Slow/poor service	380	390	400
High interest rates	381	391	401
Unfavourable terms	382	392	402
Not enough lent previously	383	393	403
Other sources more appropriate to needs	384	394	404
) DO	385	395	405
) NOT			
) RING	386	396	406
)			
Other Answers	387	397	407
Don't Know	388	398	408

- 2.16 (a) IF "YES" to 2.14: Have you any idea of what other Sources you can obtain money from?
- (b) IF "NO" to 2.14: What Sources do you think you would try?

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	(a)	(b)
State Advances Corporation	409	419
Marginal Lands Board	410	420
Trading Banks/Trustee Savings Bank	411	421
Solicitors	412	422
Vendor Mortgages	413	423
Insurance Companies	414	424
Private Individuals	415	425
Building Societies	416	426
Other Answers (specify opposite)	417	427
Don't Know	418	428

INTERVIEWER: IN (a) RING CURRENT SOURCES

*2.17 Can you say why you would try to borrow money from these Sources/Your Source again?

Money is available to me	429
Not enough security for other sources	430
Low interest rates	431
Favourable terms	432
Good service	433
Source has good reputation	434
)	435
)	436
) DO	437
) NOT	438
) RING	439
)	
)	
Other answers	
Don't Know	

GO TO SECTION 3

*2.18 Can you say why you don't think you will be borrowing money on a long term basis in the foreseeable future?

Too old	440
Satisfied with present size and state of development of farm	441
Don't like being in debt	442
Interest rates high	443
Pessimistic about future state of farming	444
Can't borrow any more	445
)	
)	446
) DO	
) NOT	447
) RING	
)	448
)	
Other Answers	449
Don't Know	450

CODES 451 - 456 SPARE

SECTION 3 SHORT TERM FINANCE: TRADING BANKS

3.1 Do you have an account with any trading bank?

Yes 457

No 458

IF "YES" CONTINUE: OTHERWISE GO TO 3.37

3.2 Can you tell me the name of the bank?

Bank of New Zealand 459

Australia and New Zealand Bank 460

National Bank of New Zealand 461

Bank of New South Wales 462

Commercial Bank of Australia 463

3.3 About how many miles away from the farm is your branch?

Under 10	464
11 - 20	465
21 - 30	466
31 and over	467

3.4 Is this the nearest branch of any bank?

Yes	468
No	469

3.5 How often do you visit the bank?

About once a week	470
About once a fortnight	471
About once a month	472
About once a quarter	473
Rarely	474
Never	475

3.6 Have you ever banked with any other bank apart from
.....? (INTERVIEWER SPECIFY)

Yes	476
No	477

IF "YES" CONTINUE AND NOTE BANK OPPOSITE:

OTHERWISE GO TO 3.10

*3.7 Can you say why you stopped banking with them?

Changed farms	478
Poor service given	479
Expensive/poor credit facilities	480
Not very sympathetic to my farming needs	481

LVI

Personal reasons	482
)	
)	483
) DO	
) NOT	484
) RING	
)	485
)	
Other Answers	486
Don't Know	487

3.8 You have mentioned/not mentioned credit facilities as one of the factors influencing your decision to change banks. How important would you say this factor was?

Very important	488
Important	489
Moderately important	490
Not very important	491
Of no importance whatsoever	492

**3.9 Can you say why? (IN WORDS OPPOSITE)

*3.10 Can you tell me why you bank with the?
(INTERVIEWER SPECIFY)

(INTERVIEWER: USE SHOWCARD 3)

	<u>S</u>	<u>ASC</u>
Geographically convenient	493	504
Good service/advice	494	505
Family always banked there	495	506
Advised to bank there	496	507
Good credit facilities	497	508
Personal reasons (e.g. friendly with manager)	498	509

	)	499	510
	) DO		
	) NOT	500	511
	) RING		
	)	501	512
)		
	Other Answers	502	513
	Don't Know	503	514
3.11	You have mentioned/not mentioned credit facilities as one of the factors influencing your choice of bank. How important would you say bank credit facilities are in the conduct of your business?		
	Very important	515	
	Important	516	
	Moderately important	517	
	Not very important	518	
	Of no importance whatsoever	519	
**3.12	Can you say why? (IN WORDS OPPOSITE)		
3.13	Have you ever thought about banking with any other bank?		
	Yes	520	
	No	521	
**3.14	<u>IF "YES" TO 3.13:</u> Can you say why? (IN WORDS OPPOSITE)		
3.15	Have you got more than one bank account (i.e. business, private etc.).		
	Yes	522	
	No	523	
3.16	Can you tell me if you use any of these bank services?		
	(INTERVIEWER: USE SHOWCARD 4)		
	Cheque services	524	
	Savings a/c./interest earning deposits	525	

Standing Order payments	526
Safe custody for documents, valuables etc.	527
Travel arrangements (e.g. travellers cheques, foreign currency etc.)	528
Provision of economic/statist- ical information	529
Financial/investment advice	530
Exporting/importing advice and finance	531
None of these	532

3.17 Turning now to your bank account, can you tell me if
your bank account is in overdraft at the moment?

Yes	533
No	534
Don't Know	535
No Answer	536

3.18 Has your bank account been in overdraft at any time in
the last 12 months?

Yes	537
No	538
Don't Know	539
No Answer	540

3.19 Has your bank account ever been in overdraft?

Yes	541
No	542
Don't Know	543
No Answer	544

IF "YES" TO 3.18 CONTINUE: OTHERWISE

Go TO TO 3.35

3.20 Is your account subject to a limit of overdraft?

Yes	545
No	546
Don't Know	547
No Answer	548

IF "YES" CONTINUE: OTHERWISE GO TO 3.27

3.21 Can you tell me what your overdraft limit is?

(INTERVIEWER: FILL IN ON PAGE 1)

3.22 Has your overdraft been at the limit allowed at any time within the last 12 months?

Yes	549
No	550
Don't Know	551
No Answer	552

3.23 Has your overdraft ever been at its limit?

Yes	553
No	554
Don't Know	555
No Answer	556

3.24 Has your overdraft limit changed at all in the last five years?

Increased	557
Decreased	558
No change	559
Don't Know	560

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3.25 Have you always had your request for a change in overdraft limit granted?

Yes 561

No 562

Don't Know 563

No Answer 564

**3.26 IF "NO" TO 3.25: Can you tell me about the circumstances? (IN WORDS OPPOSITE)

3.27 At what time of year is your bank overdraft generally greatest?

Jan - March 565

Apr - June 566

July - Sept 567

Oct - Dec 568

Don't Know 569

3.28 Can you tell me for what sort of purposes you use your overdraft with your bank?

(INTERVIEWER: USE SHOWCARD 5)

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	<u>S</u>	<u>ASC</u>
Source of funds beteen payment of bills and receipts	570	584
To pay farm bills, wages etc.	571	586
To finance development work	572	587
To finance purchase of plant and machinery	573	588
To finance tax payments	574	589
To finance purchase of stock	575	590
Private purposes	576	591
As a source of finance to counter income changes	577	592
Try not to go into overdraft	578	593
)	579	594
) DO	580	595
) NOT	581	596
) RING	582	597
)	583	598
No Answer		
Don't Know		
3.29 Have you ever been asked to reduce your overdraft?		
Yes	599	
No	600	
Don't Know	601	
No Answer	602	
3.30 IF "YES" TO 3.29: Can you tell me about the circumstances? (IN WORDS OPPOSITE)		
3.31 Have you always had your request for an overdraft granted?		
Yes	603	
No	604	
Don't Know	605	
No Answer	606	

**3.32 IF "NO" TO 3.31: Can you tell me about the
circumstances? (IN WORDS OPPOSITE)

3.33 Have you come across any of these problems in your
experience of borrowing money from the bank?

(INTERVIEWER: USE SHOWCARD 6)

Credit expensive	607
High security required	608
Credit difficult/impossible to arrange	609
Rapid rate of repayment required	610
Excessively cautious in lending	611
Willing to provide only small loan	612
Interfere in running of business	613
Not sufficient agricultural knowledge	614
None of problems experienced	615

*3.34 Are you aware of the restrictions and controls that
are placed over the banks, limiting their freedom
of action in the lending field?

Yes	616
No	617
Don't Know	618
No Answer	619

(INTERVIEWER: NOTE SPONTANEOUS ANSWER OPPOSITE)

3.35 Can you think of any other services that the banks could
offer that would be of help to you in running your
business?

Yes	620
No	621

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**3.36 IF "YES" TO 3.35: Can you say what?

(IN WORDS OPPOSITE)

GO TO SECTION 4

3.37 Have you ever had a bank account?

Yes 622

No 623

**3.38 IF "YES TO 3.37: Can you say why you closed it?

(IN WORDS OPPOSITE)

GO TO SECTION 4

3.39 IF "NO" TO 3.37: Have you ever thought about opening a bank account?

Yes 624

No 625

Don't Know 626

**3.40 Can you say why you have never opened a bank account?

(IN WORDS OPPOSITE)

3.41 Do you think that any of the following bank services would be of use to you?

(INTERVIEWER: USE SHOWCARD 4)

Cheque services 627

Savings account/interest earning deposits 628

Regular payments of recurring items 629

Safe custody for documents, valuables etc. 630

Travel arrangements (e.g. travellers cheques, foreign currency etc.) 631

Provision of economic/statistical information 632

Financial/investment advice 633

Exporting/importing advice and finance	634
---	-----

None of these	635
---------------	-----

CODES 636 - 700 SPARE

SECTION 4 SHORT TERM FINANCE: STOCK AND STATION AGENTS

4.1 Do you have a trading account with any Stock and
Station agent?

Yes	701
-----	-----

No	702
----	-----

IF "YES" CONTINUE: IF "NO" GO TO 4.35

4.2 Can you say which one?

Dalgety New Zealand Ltd.	703
--------------------------	-----

N.M.A. Ltd.	704
-------------	-----

Wright Stephenson & Co. Ltd.	705
------------------------------	-----

Other (Main firm in area)	706
---------------------------	-----

Other (specify)	707
-----------------	-----

4.3 How far away is the accounting branch that you deal
with from the farm?

Under 10 miles	708
----------------	-----

11 - 20 miles	709
---------------	-----

21 - 30 miles	710
---------------	-----

31 and over	711
-------------	-----

4.4 Is that the nearest branch of any stock firm to the
farm?

Yes	712
-----	-----

No	713
----	-----

*4.5 Have you ever had a trading account with any other firm apart from? (INTERVIEWER SPECIFY)

Yes 714

No 715

IF "YES" CONTINUE AND NOTE FIRM OPPOSITE: OTHERWISE

GO TO 4.9

*4.6 Can you say why you transferred your account?

Poor prices offered 716

Changed farms 717

Poor service given 718

Poor credit facilities 719

Not very sympathetic to my farming needs 720

Personal reasons 721

)
) 722

) DO

) NOT 723

) RING

) 724

)

Other answers 725

Don't Know 726

4.7 You have mentioned/not mentioned the provision of credit facilities as a factor influencing your decision to change firms. How important would you say this factor was?

Very important 727

Important 728

Moderately important 729

Not very important 730

Of no importance whatsoever 731

**4.8 Can you say why?

(IN WORDS OPPOSITE)

4.9 Can you say why you deal with.....?

(INTERVIEWER SPECIFY)

(INTERVIEWER: USE SHOWCARD 7)

	<u>S</u>	<u>ASC</u>
Geographically convenient	732	743
Good prices offered for my products	733	744
Good credit facilities	734	745
Good service/advice given	735	746
Always dealt with them	736	747
Tied to them	737	748
)		
)	738	749
) DO		
) NOT	739	750
) RING		
)	740	751
)		
Other Answers	741	752
Don't Know	742	753

4.10 You have mentioned/not mentioned the provision of credit facilities as a factor influencing you in your choice of stock firm. How important would you say stock firm credit facilities are in your business?

Very important	754
Important	755
Moderately important	756
Not very important	757
Of no importance whatsoever	758

**4.11 Can you say why?

(IN WORDS OPPOSITE)

4.12 What do you consider the main function of your stock firm to be?

Stock purchase/sale 759

Wool buyers 760

Supply of farm requisites 761

Farm finance 762

Service/advice 763

) 764

) DO 765

) NOT

) RING 766

)

)

Other Answers 767

Don't Know 768

4.13 Talking now of your trading account, can you tell me if it is overdrawn at present?

Yes 769

No 770

Don't Know 771

No Answer 772

4.14 Has your trading account been in overdraft at any time in the last 12 months?

Yes 773

No 774

Don't Know 775

No Answer 776

4.15 Has your trading account ever been in overdraft?

Yes 777

No 778

Don't Know 779

No Answer 780

IF "YES" TO 4.14 CONTINUE: OTHERWISE GO TO 4.33

4.16 Is the account subject to a limit of overdraft?

Yes 781

No 782

Don't Know 783

No Answer 784

IF "YES" CONTINUE: OTHERWISE GO TO 4.23

4.17 Can you tell me what your overdraft limit is?

(INTERVIEWER: FILL IN ON PAGE 1)

4.18 Has your overdraft been at the limit allowed at any time within the last 12 months?

Yes 785

No 786

Don't Know 787

No Answer 788

4.19 Has your overdraft ever been at its limit?

Yes 789

No 790

Don't Know 791

No Answer 792

4.20 Has your overdraft limit changed at all in the last 5 years?

Increased	793
Decreased	794
No change	795
Don't Know	796

4.21 Have you always had your request for a change in overdraft limit granted?

Yes	797
No	798
Don't Know	799
No Answer	800

**4.22 IF "NO" TO 4.21: Can you tell me about the circumstances?

(IN WORDS OPPOSITE)

4.23 At what time of year is your overdraft with your firm generally greatest?

Jan - Mar	801
Apr - June	802
July - Sept	803
Oct - Dec	804
Don't Know	805

4.24 Can you tell me for what sort of purposes you use your overdraft with your firm?

(INTERVIEWER: USE SHOWCARD 5)

	<u>S</u>	<u>ASC</u>
Source of funds between payment of bills and receipts	806	820
To pay farm bills, wages etc.	807	821

	<u>S</u>	<u>ASC</u>
To finance development work	808	822
To finance purchase of plant and machinery	809	823
To finance tax payments	810	824
To finance purchases of stock	811	825
Private purposes	812	826
As a source of finance to counter income changes	813	827
Try not to go into overdraft	814	828
)	815	829
)		
) DO	816	830
) NOT		
) RING	817	831
)		
)	818	832
Other Answers		
Don't Know	819	833
4.25 Is your overdraft secured in any way?		
Yes	834	
No	835	
Don't Know	836	
No Answer	837	
4.26 Has your overdraft ever been secured in any way?		
Yes	838	
No	839	
Don't Know	840	
No Answer	841	

4.27	Have you ever been asked to reduce your overdraft?	
	Yes	842
	No	843
	Don't Know	844
	No Answer	845
**4.28	<u>IF "YES" TO 4.27:</u> Can you tell me about the circumstances? (IN WORDS OPPOSITE)	
4.29	Have you always had your request for an overdraft granted?	
	Yes	846
	No	847
	Don't Know	848
	No Answer	849
4.30	<u>IF "NO" TO 4.29:</u> Can you tell me about the circumstances? (IN WORDS OPPOSITE)	
4.31	Have you come across any of these problems in your experience of borrowing money from the firms?	
	(INTERVIEWER: USE SHOWCARD 6)	
	Credit expensive	850
	High security required	851
	Credit difficult/impossible to arrange	852
	Rapid rate of repayment required	853
	Excessively cautious in lending	854
	Willing to provide only small loan	855
	Interfere in running of business	856
	Not sufficient agricultural knowledge	857
	None of criticisms justified	858

*4.32 Are you aware of the fact that the stock firms are restricted by the government, to the provision of seasonal finance?

Yes	859
No	860
Don't Know	861

(INTERVIEWER: NOTE SPONTANEOUS ANSWER OPPOSITE)

4.33 Can you think of any other services that the firms could offer to be of help to you in running your business?

Yes	862
No	863

**4.34 IF "YES" TO 4.33: Can you say what?

(IN WORDS OPPOSITE)

GO TO SECTION 5.

4.35 Have you ever had a trading account with any stock firm?

Yes	864
No	865

**4.36 IF "YES" TO 4.35: Can you say why you closed it?

(IN WORDS OPPOSITE)

GO TO SECTION 5

4.37 IF "NO" TO 4.35: Have you ever thought about opening a trading account with any stock firm?

Yes	866
No	867
Don't Know	868

**4.38 Can you say why you have never opened a trading account with any firm?

(IN WORDS OPPOSITE)

**4.39 Do you think that there would be any benefit to you in opening a trading account?

(IN WORDS OPPOSITE)

CODES 869 - 1000 SPARE

SECTION 5 SHORT TERM FINANCE - DAIRY COMPANIES

5.1 Do you have an account with any dairy company?

Yes 1001

No 1002

IF "YES" CONTINUE: OTHERWISE GO TO SECTION 6

5.2 Has your account ever been in overdraft?

Yes 1003

No 1004

Don't Know 1005

No Answer 1006

IF "YES" CONTINUE: OTHERWISE GO TO SECTION 6

5.3 How do you use your overdraft with your dairy company?

(INTERVIEWER: USE SHOWCARD 5)

	<u>S</u>	<u>ASC</u>
Source of funds between payment of bills and receipts	1007	1022
To pay farm bills, wages etc.	1008	1023
To finance development work	1009	1024
To finance purchase of plant and machinery	1010	1025
To finance tax payments	1011	1026

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To finance purchase of stock	1012	1027
Private purposes	1013	1028
As a source of finance to counter income changes	1014	1029
Try not to go into overdraft	1015	1030
)		
)	1016	1031
)		
) DO	1017	1032
) NOT		
) RING	1018	1035
)		
)	1019	1034
)		
Other Answers	1020	1035
Don't Know	1021	1036

5.4 Would you say that in general the credit facilities
offered by your dairy company are adequate for your
purposes?

Adequate	1037
Not adequate	1038
Don't Know	1039
No Answer	1040

**5.5 IF "NOT ADEQUATE"

Can you say in what ways they are not adequate?

(IN WORDS OPPOSITE)

5.6 Can you think of any improvements in credit facilities
that your dairy company could make?

Yes	1041
No	1042

5.7 IF "YES" TO 5.6: Can you say what?

(IN WORDS OPPOSITE)

SECTION 6 PRIVATE FUNDS

6.1 Are you at present using any unsecured money in the business that was borrowed from private or family sources?

Yes 1101

No 1102

IF "YES" CONTINUE: OTHERWISE GO TO SECTION 7

6.2 Can you tell me how much money is outstanding?

(INTERVIEWER: FILL IN ON PAGE 1)

6.3 Can you tell me who you borrowed it from?

Parents 1103

Wife 1104

Other family 1105

Other 1106

6.4 Can you say for what purposes you borrowed this money?

Purchase of land 1107

Capital/Development Expenditure 1108

Working capital 1109

Private purposes 1110

Other (specify) 1111

Don't Know 1112

6.5 Can you say why you borrowed from?

(INTERVIEWER SPECIFY)

Cheap credit 1113

Credit available/plentiful 1114

Less Restrictions over use 1115

Could not get credit from institutions 1116

Personal reasons	1117
)	
)	1118
) DO	
) NOT	1119
) RING	
)	1120
)	
Other Answers	1121
Don't Know	1122

6.6 If you had not been able to borrow privately, do you think that you would have tried to borrow from a lending insitution?

Yes 1123

No 1124

6.7 IF "NO" TO 6.6: Can you say why not?

CODES 1125 - 1140 SPARE

SECTION 7 PROJECT TYPE FINANCE

7.1 Have you spent any money on any plant and machinery in the last 12 months?

Yes 1141

No 1142

*7.2 How do you normally pay for purchases of plant and machinery?

With Cash 1143

On account 1144

On terms 1145

Part cash/part terms 1146

Other (specify) 1147

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- 7.3 (a) Would you say that there is any plant and machinery on the farm at the moment that needs replacing?
- (b) Would you say that there is any plant and machinery that you need on the farm, but don't own at present?

	(a) <u>Replace-</u> <u>ment</u>	(b) <u>New</u> <u>Plant</u>
Yes	1148	1150
No	1149	1151

IF "YES" TO 7.3 CONTINUE: OTHERWISE GO TO 7.9

- 7.4 Can you say what?

Milking plant/equipment	1152	1162
Tractor	1153	1163
Trucks	1154	1164
Header/grain storage equipment	1155	1165
Plough/cultivator/harrows/drill	1156	1166
Baler/rake/mower	1157	1167
)	1158	1168
) DO	1159	1169
) NOT	1160	1170
) RING	1161	1171
)		
Other Answers		

- 7.5 Have you any idea when you will be getting the most pressing of these items?

6 months or under	1172
12 months or under	1173
Other answers (specify)	1174
Don't Know	1175

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7.6 Have you thought about borrowing money to buy
.....?

(INTERVIEWER SPECIFY)

Yes 1176

No 1177

**7.7 IF "YES" TO 7.6: Can you say why you haven't borrowed
already?

*7.8 IF "NO" TO 7.6: Can you say why you would not borrow?

Finance expenditure from income 1178

Can't borrow any more 1179

Pessimistic about future state of
farming 1180

In sufficient debt already 1181

) 1182

) DO 1183

) NOT

) RING 1184

)

Other answers (specify) 1185

Don't Know 1186

7.9 Have you spent any money on erection or extension of farm
buildings in the last 12 months?

Yes 1187

No 1188

7.10 Do you need to do any work of this sort at the moment?

Yes 1189

No 1190

IF "YES" CONTINUE: IF "NO" GO TO 7.16

7.11 Can you say what?

(INTERVIEWER: SPECIFY OPPOSITE)

7.12 Have you any idea when you will be doing the work?

6 months or under 1191

12 months or under 1192

Other Answers (specify) 1193

Other 1194

7.13 Have you thought about borrowing money to
.....?

(INTERVIEWER: SPECIFY)

Yes 1195

No 1196

**7.14 IF "YES" TO 7.13: Can you say why you haven't borrowed
already?

(IN WORDS OPPOSITE)

7.15 IF "NO" TO 7.13: Can you say why you would not borrow?

Finance expenditure from income 1197

Can't borrow any more 1198

Pessimistic about future state of
farming 1199

In sufficient debt already 1200

Doing work ourselves 1201

)
) 1202

) DO
) NOT 1203

) RING
) 1204

Other Answers 1205

Don't Know 1206

7.16 Have you spent any money on any of these items in the past 12 months?

(INTERVIEWER: USE SHOWCARD 7)

7.17 Do you plan to carry out any work of this sort in the coming 12 months?

CODE AS:	<u>Q.7.16</u>	<u>Q.7.17</u>
Development of virgin land/scrub cutting etc.	1207	1217
Pasture replacement	1208	1218
Lucerne replanting/new planting	1209	1219
Plantation replanting/new planting	1210	1220
Orchard replanting/new planting	1211	1221
Irrigation/drainage work	1212	1222
Construction of landing strips/ access roads etc.	1213	1223
Purchase and siting of tanks and troughs	1214	1224
Purchase and erection of new fencing	1215	1225
None of these	1216	1226

7.18 Have you ever borrowed or financed this work out of overdraft?

Yes 1227

No 1228

IF "NONE OF THESE" TO Q.7.17 GO TO 7.22:

OTHERWISE CONTINUE

7.19 Would you consider borrowing to carry out this future work?

Yes 1229

No 1230

**7.20 IF "YES" TO 7.19: Can you say why you haven't borrowed already?

(IN WORDS OPPOSITE)

7.21 IF "NO" TO 7.19: Can you say why you would not borrow?

Finance expenditure from income	1231
Can't borrow any more	1232
Pessimistic about future state of farming	1233
In sufficient debt already	1234
No incentive to develop	1235
Normal farm work	1236
)	
)	1237
) DO	
) NOT	1238
) RING	
)	1239
)	
Other Answers	1240
Don't Know	1241

7.22 Do you need to spend any money on the house at the moment?

Yes 1242

No 1243

IF "YES" CONTINUE: OTHERWISE GO TO 7.25

7.23 Can you say what?

Repairs to house	1244
Extension to house	1245
Erection of new house	1246
Furniture and fittings	1247
Other (specify)	1248

7.24 Have you any idea when this work will be done?

6 months or under	1249
12 months or under	1250
Other answers (specify)	1251
Don't Know	1252

7.25 Do you ever find that there is a need for money to be spent on the home, and at the same time on the farm?

Yes 1253

No 1254

IF "YES" CONTINUE: OTHERWISE GO TO SECTION 8

7.26 What usually happens in such a case?

Money spent on farm 1255

Money spent on home 1256

Sometimes one: sometimes other 1257

Other answers (specify) 1258

7.27 Would you ever borrow if such circumstances arose again?

Yes 1259

No 1260

Don't Know 1261

7.28 IF "NO" TO 7.27: Can you say why not?

Money always spent on farm 1262

In sufficient debt already 1263

Can't borrow any more 1264

Can get by on present set up 1265

) 1266

) DO 1267

) NOT 1267

) RING 1268

) 1268

Other Answers 1269

Don't Know 1270

SECTION 8 GENERAL

8.1 How adequate, in general terms, would you say credit facilities are

(a) for you personally and,

(b) for farmers in general.

	(a) <u>Personally</u>	(b) <u>Farmers</u> <u>in</u> <u>General</u>
Completely adequate	1301	1307
Adequate	1302	1308
Satisfactory	1303	1309
Inadequate	1304	1310
Completely inadequate	1305	1311
Don't Know	1306	1312

**8.2 Can you say why?

(IN WORDS OPPOSITE)

**8.3 How do you feel towards the idea of a rural bank?

Favourable 1313

Unfavourable 1314

Don't Know 1315

(IN WORDS OPPOSITE)

*8.4 Do you normally expect short term loans to be made to farmers on an unsecured basis?

Yes 1316

No 1317

Don't Know 1318

**8.5 How do you feel about putting up security for a short term loan?

(IN WORDS OPPOSITE)

**8.6 Can you suggest any changes that the lending institutions could make in the services they offer to be of benefit to

(a) you and,

(b) farmers in general.

(IN WORDS OPPOSITE)

INTERVIEWER PROMPT ON:

(i) Management Advice/Advisory Services given by Institutions.

(ii) Budgeting.

8.7 Here is a booklet produced by an English bank which gives details of all sources of credit, grants and tax reliefs etc. that are available to English farmers. Would you think that such a booklet, written for New Zealand conditions, could be useful to you.

(INTERVIEWER SHOW BOOKLET BRIEFLY)

Useful 1319

Not Useful 1320

Don't Know 1321

**8.8 What would you say were the major problems facing New Zealand farming today?

(IN WORDS OPPOSITE)

8.9 If you have other comments at all, I would be very pleased to have them.

(IN WORDS OPPOSITE)

APPENDIX G: STATE VERSUS PRIVATE LAND TENURE: SOME ARITHMETICAL
EXAMPLES OF THE EFFECTS ON RESOURCE FLOWS AND PRODUCTION

In this Appendix, some arithmetical examples are presented to illustrate the discussion of Section 18.4 and the models of Figures 18.2 and 18.3. The actual numerical results of these examples are heavily dependent on the assumptions made, i.e. on the magnitude of the basic parameters and on the hypothesised capital-output structure utilised (Table G.1). These empirical results should therefore be interpreted with extreme caution. The direction of change in the allocation of resources, and in final total production as a result of various alternative situations is of far greater importance.

Data Utilised

- (i) Basic parameters were assessed as follows:

P (farm sector profits) = 1000;

R (repayments on land debt) = 250;

M (new capital created from non-farm economic activity) = 875;

$p = p^* = r$ (drain proportions) = 0.5;

r^* (drain proportion - State purchase case) = 0.65;

$q.X$ (funds for private/State land purchase) = 500;

W_L (capital-output ratio, production incentive effect) = 10;

$R^* + T$ (rent and reduced principal repayments) = 100

- (ii) Production and capital-output ratio data utilised are summarised below (Table G.1). The structure of data in this table does allow for the representation of a state of diminishing marginal returns in capital resource allocation. Implicit in this data are the assumptions that variables are defined in real terms, and that there is no technical progress in the static environment.

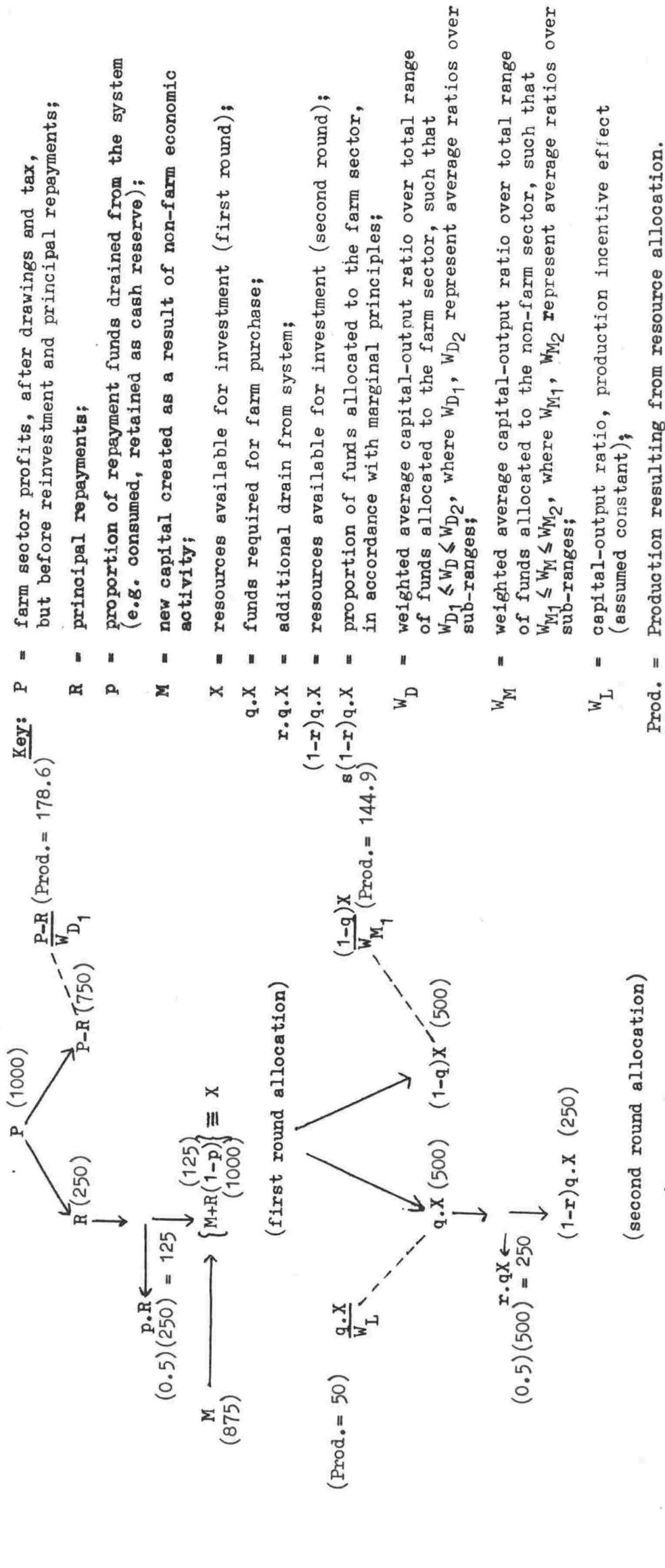
Table G.1. Hypothetical Capital-Output Ratios

<u>Funds Allocated</u>	<u>Non-Farm Sector</u>			<u>Farm Sector</u>		
	<u>Output</u>	<u>Average K/O Ratio</u>	<u>Marginal K/O Ratio</u>	<u>Output</u>	<u>Average K/O Ratio</u>	<u>Marginal K/O Ratio</u>
50	16.7	3.0	3.0	14.3	3.5	3.5
100	32.8	3.05	3.1	28.2	3.55	3.6
150	48.4	3.1	3.2	41.7	3.6	3.7
200	63.5	3.15	3.3	54.8	3.65	3.8
250	78.1	3.2	3.4	67.6	3.7	3.9
300	92.3	3.25	3.5	80.0	3.75	4.0
350	106.0	3.3	3.6	92.1	3.8	4.1
400	119.4	3.35	3.7	103.9	3.85	4.2
450	132.3	3.4	3.9	115.3	3.9	4.3
500	144.9	3.45	4.0	126.6	3.95	4.4
550	157.1	3.5	4.1	137.5	4.0	4.6
600	169.0	3.55	4.2	148.1	4.05	4.7
650	180.5	3.6	4.3	158.5	4.1	4.8
700	191.8	3.65	4.4	168.7	4.15	4.9
750	202.7	3.7	4.6	178.6	4.2	5.1
800	213.3	3.75	4.7	188.2	4.25	5.2
850	223.7	3.8	4.8	197.6	4.3	5.3
900	233.7	3.85	5.0	206.9	4.35	5.4
950	243.6	3.9	5.1	215.9	4.4	5.6
1000	253.2	3.95	5.2	224.7	4.45	5.7
1050	262.5	4.0	5.4	233.3	4.5	5.8
1100	271.6	4.05	5.5	241.7	4.55	6.0
1150	280.5	4.1	5.6	250.0	4.6	6.0
1200	289.2	4.15	5.7	258.1	4.65	6.2
1250	297.7	4.2	5.9	266.0	4.7	6.3

An Example of the Calculations

Given the above data, the flow of resources and resultant production under a system of private land purchase can be illustrated (Fig.G.1). This figure indicates that 750 units of capital funds are allocated to the farm sector at the outset (for "ploughback" purposes), and 750 units in toto to the non-farm sector. This non-farm allocation is the result of a two-stage process. Firstly, there is a first round allocation of 500 units and subsequently a second round

CASE I: PRIVATE FARM PURCHASE
Fig. G.1 The Flow of Funds and Production Increases in a
System of Private Farm Purchase and Freehold Tenure
(period t)



allocation of 250 units. As a result of capital-output ratio variances at all equivalent funds levels (from Table G.1), all funds at the second round allocation stage are assigned to the non-farm sector. Even after this allocation, the non-farm sector incremental capital-output ratio (750 units) is 4.6, compared with the farm sector ratio, after the "ploughback" allocation of 750 units, of 5.1. If funds were available (which in this example they are not) an additional 200 units of funds could have been allocated to the non-farm sector at the second round stage before incremental capital-output ratios of the two sectors would have been equated. From Table G.1, farm sector production (750 units of funds) is 178.6 and non-farm sector production (750 units of funds) is 202.7. The W_L effect results in an additional 50 units of production, and total production is therefore 431.3 units.

In other cases however, both sectors will receive an allocation of funds at the second round. Examples where this occurs are presented in Table G.2. This table summarises the results of some allocations brought about by the two alternative systems, and the sensitivity of key variables on production is briefly studied. Seven situations are examined:

- Case I: As per basic data above;
- Case II: Doubling of R and (R^*+T) ;
- Case III: As in II, but with cash drain as in I;
- Case IV: Increase in $q.X$ to 750;
- Case V: As in IV, but with cash drain as in I;
- Case VI: Decrease in $q.X$ to 250;
- Case VII: As in VI, but with cash drain as in I.

"Basic production" is defined as total production, under the private and State land tenure systems, as given in Case I. The effect of changes in production in subsequent cases is compared with this basis. Strict comparison between production levels under the private and State tenure systems is difficult, as a result of what may be arbitrary data assumptions. However, in Table G.2, production in each system is compared under two alternative conditions. This may be a more valid comparison. These conditions are:

- (i) $W_D < W_M$ i.e. farm sector productivity greater than non-farm sector productivity for all equivalent resource allocations. This situation is illustrated in Table G.1;
- (ii) $W_M < W_D$ i.e. farm sector productivity lower than non-farm sector productivity for all equivalent resource allocations. This situation is illustrated by reversing the headings "non-farm sector" and "farm sector" and using the same data of Table G.1.

The Results of Table G.2

Results from Table G.2 help to support the discussion of Section 18.4. The immediate observation is that total production changes under and between both systems of land tenure are in all cases small if the W_L effect (i.e. production incentive through farm ownership) is ignored. Changes would only be large if there were significant differences in farm and non-farm sector productivity. The W_L effect has an important effect on production in these examples. As a result of this factor, in all cases considered production was higher under the system of private land tenure. An alternative assumption from that actually used ($W_L = 10$) may contradict this result. The examples therefore help to reinforce the comment in the text (18.5) that there is a strong need to empirically measure the W_L effect in the real environment before the alternative systems of land tenure can be effectively compared in the economic context.

The examples of Table G.2 show that apart from the productivity information (Table G.1) three factors are of major importance in determining production levels in the models. These are:

- (i) the cash drain. This influences the volume of final resources committed and total production. The examples indicate the differential effects of change in total drain (Cases II, IV, VI), from the basis in Case I, and the effect of changes in the magnitude of the p , r and r^* parameters (Cases III, V, VII), leaving the same drain as in Case I;

- (ii) the initial drain of funds from the farm sector into the financial system. This is the variable R (in the private purchase system), and (R^*+T) , in the State purchase system. In the case where farm sector productivity is higher than non-farm sector productivity an increase in R or (R^*+T) , (Case II), may drain funds from the farm sector unnecessarily, and check total production. This is an argument in favour of the State tenure system. On the other hand, where farm sector productivity is lower than non-farm sector productivity, the argument in favour of a private land purchase system is that an increase in R will release funds from the farm sector for subsequent re-allocation;
- (iii) the magnitude of the $q.X$ factor. This represents funds for private or State purchase. As $q.X$ increases, subject to constant cash drain, more funds are made available for marginal second round allocation. There is also an increasing W_L effect. The result is an increase in total production in the private purchase case (Case V). The converse also applies (Case VII). In these examples, comparison of the $q.X$ effect on the State system is more difficult, as a result of the more marked effect of cash drain, and the lack of a W_L effect. However, ignoring these effects, production under the State system is likely to be greater under the private system as $q.X$ decreases (Cases VI and VII). This is as a result of the differential effect of productivities in initial allocations.

TABLE G.2. SOME ARITHMETICAL EXAMPLES OF THE
SENSITIVITY OF VARIABLES ON FUNDS
ALLOCATIONS AND ON PRODUCTION

I: ALLOCATION AS PER BASIC DATA	III: AS IN II, BUT WITH DRAIN AS IN I			
	PRIVATE PURCHASE SYSTEM		STATE PURCHASE SYSTEM	
	$W_M < W_D$	$W_D < W_M$	$W_M < W_D$	$W_D < W_M$
Funds to Farm Sector	750	850	650	800
Funds to Non-Farm Sector	750	650	850	700
Total Funds Committed	1500	1500	1500	1500
Cash Drain	375	375	375	375
Total Production	431.3	432.3	432.2	432.0
(Prodn. excl. W_L effect)	(381.3)	(382.3)	(382.2)	(382.0)
Change in Production from I			+0.9	-0.3
Ave. K/O Ratio	3.478	3.471	3.471	3.472
				3.947
				3.925
II: R DOUBLED TO 500 (PRIVATE SYSTEM); R*+T DOUBLED TO 200 (STATE SYSTEM)	IV: INCREASE IN q.X (FARM PURCHASE FUNDS) TO 750			
	PRIVATE PURCHASE SYSTEM		STATE PURCHASE SYSTEM	
	$W_M < W_D$	$W_D < W_M$	$W_M < W_D$	$W_D < W_M$
Funds to Farm Sector	595	750	750	805
Funds to Non-Farm Sector	770	625	625	570
Total Funds Committed	1375	1375	1375	1375
Cash Drain	500	500	500	500
Total Production	404.0	406.0	428.6	431.0
(Prodn. excl. W_L effect)	(354.0)	(356.0)	(353.6)	(356.0)
Change in Production from I	-27.3	-26.3	-2.7	-1.3
Ave. K/O Ratio	3.403	3.387	3.208	3.196
				3.983
				3.856

TABLE G.2 (CONT.)

V: AS IN IV, BUT WITH DRAIN AS IN I

	PRIVATE PURCHASE SYSTEM		STATE PURCHASE SYSTEM	
	$W_M < W_D$	$W_D < W_M$	$W_M < W_D$	$W_D < W_M$
Funds to Farm Sector	750	850	900	900
Funds to Non-Farm Sector	750	650	600	600
Total Funds Committed	1500	1500	1500	1500
Cash Drain	375	375	375	375
Total Production	456.3	457.2	375.9	381.8
(Prodn. excl. W_L effect)	(381.3)	(382.2)	(375.9)	(381.8)
Change in Production from I	+25.0	+24.9	+0.1	-
Ave. K/O Ratio	3.287	3.281	3.990	3.929

VII: AS IN VI, BUT WITH DRAIN AS IN I

	PRIVATE PURCHASE SYSTEM		STATE PURCHASE SYSTEM	
	$W_M < W_D$	$W_D < W_M$	$W_M < W_D$	$W_D < W_M$
Funds to Farm Sector	750	750	900	900
Funds to Non-Farm Sector	750	750	625	625
Total Funds Committed	1500	1500	1525	1525
Cash Drain	375	375	350*	350*
Total Production	406.3	406.3	382.4	386.7
(Prodn. excl. W_L effect)	(381.3)	(381.3)	(382.4)	(386.7)
Change in Production from I	-25.0	-26.0	+6.6	+4.9
Ave. K/O Ratio	3.692	3.692	3.987	3.943

VI: DECREASE IN q.X (FARM PURCHASE FUNDS) TO 250

Funds to Farm Sector	750	875	900	900
Funds to Non-Farm Sector	875	750	762	762
Total Funds Committed	1625	1625	1662	1662
Cash Drain	250	250	213	213
Total Production	432.3	432.3	411.7	414.3
(Prodn. excl. W_L effect)	(407.3)	(407.3)	(411.7)	(414.3)
Change in Production for I	+1.0	-	+34.9	+32.5
Ave. K/O Ratio	3.759	3.759	4.037	4.012

* Total Drain system will permit.

Conclusion

These examples do illustrate in a simple fashion the private and State purchase models developed in Section 18.4. They do suggest the need for more extensive investigation. In view of the complexity involved, particularly if the dynamic environment is considered, there is a need for use of computer simulation techniques. These examples, whilst not conclusively supporting the economic case for either of the alternative land tenure systems, do indicate the variables that particularly need to be studied. These variables have already been identified in the text (Sections 18.4, 18.5).

LINCOLN COLLEGE

FARMER ATTITUDE CREDIT SURVEY

(November/December 1970)

This information bulletin is designed to give you some general facts on the survey, its aims and coverage and the personnel involved, before our Field Officer arrives to talk to you. The officer will be very pleased to elaborate on this information further, and to answer any other questions that you may have.

* * *

THE SURVEY

is one of the most ambitious to be undertaken by Lincoln College. It represents the first half of a complete study of farm credit in New Zealand, and will be followed up in early 1971 by a supplementary survey of the farm lending institutions. The need for the study has its origins in the uncertain state of farming today. At present the farmer's business, and therefore his liquidity, is being hard hit by falling prices, particularly for wool and dairy products, and the adverse weather in recent months in many areas of New Zealand. At the same time the farmer is being urged to increase his output to attempt to meet the production goals set by the Agricultural Development Conference, and to exploit the new, possibly vast export markets that appear to be opening up, at least for some farm commodities. These facts all lead to the same conclusion - that the unimpeded optimal flow of credit to the farm sector is vital for the future of the whole economy. A study such as ours will be a logical first step in determining whether in fact this is the case at present. The major aims of the survey are therefore:-

- (i) to determine the use made by farmers of the currently available financial and credit facilities.

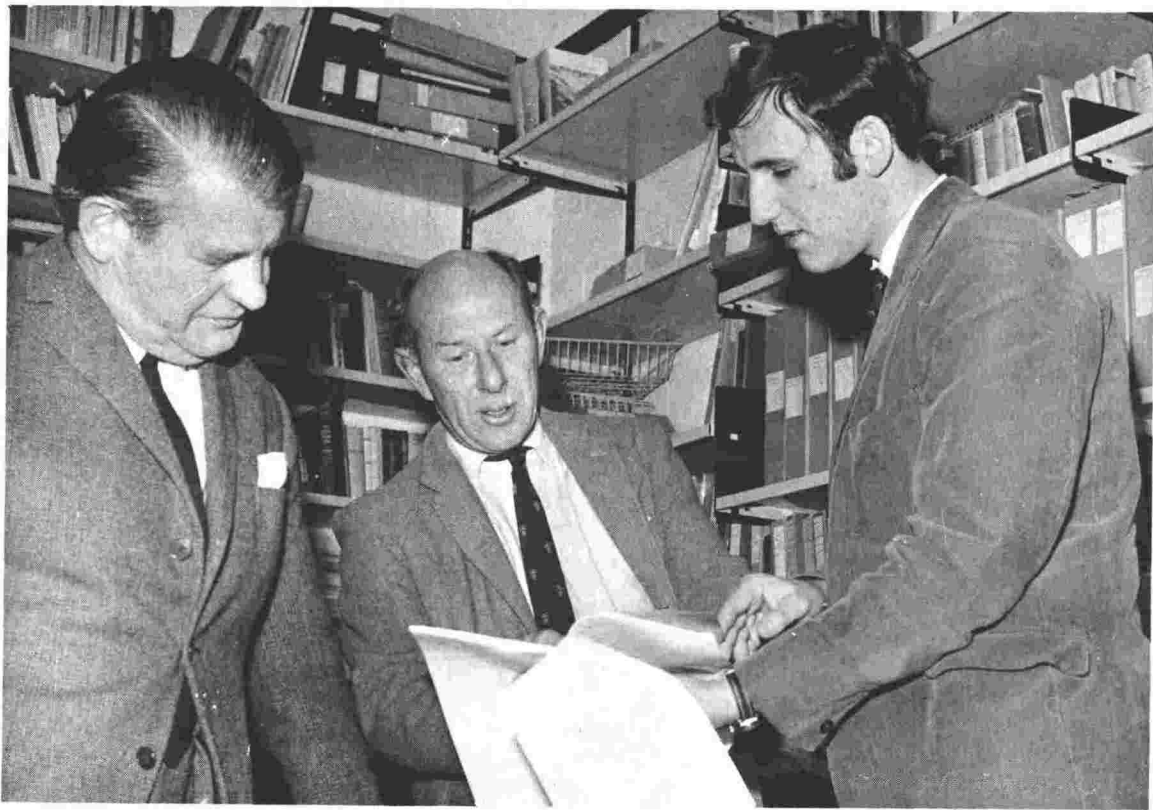
insurance companies, stock and station agents, and the Government lending institutions such as the State Advances Corporation and the Marginal Lands Board. Information will be collected on all aspects of the supply of credit to farmers.

These factors will be analysed, with special emphasis on factors such as government regulations and controls that may go to check or limit the flow of funds to farmers. Information will also be collected on the criteria used by the institutions to allocate credit to the farming sector, rather than to other sectors of the economy, and criteria used to choose to lend to one farmer rather than to another. The institutions will be presented with the criticisms of farmers that have arisen from the Farmer Survey, and asked to comment on the farmer's suggestions for improvements and changes in the services that they offer. It may be that the institutions themselves are considering offering additional services, for which they are not yet sure of the demand.

Thus, by using the information from the Farmer Survey to the full, it is hoped to educate the financial institutions to know something more of the farmer's position, attitudes and needs.

Information from the Farmer Survey, together with the supplementary survey, should go far to explain and describe the workings of the New Zealand farm credit market. The survey results should add greatly to the general background knowledge of the institutions in their dealings with farmers both at present and in the immediate years to come.

In this way it is hoped that they can offer a greater variety and volume of financial and credit services to farmers, and appreciate the farmer as an individual and a businessman to a greater extent than at present. Therefore the farmer stands to benefit, the institutions stand to benefit and ultimately the whole economy will reap the rewards of a higher level of understanding and co-operation between these two vital sectors of the economy.



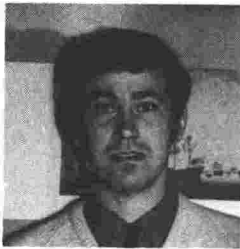
Courtesy: Green & Hahn, Christchurch.

PROFESSOR PHILPOTT Professor of Agricultural Economics at Lincoln since 1959, and Director of the Agricultural Economics Research Unit. Well known throughout New Zealand for his publications and forthright views. Shortly moving from Lincoln to the Macarthy Chair of Economics at the Victoria University of Wellington. Professor Philpott will direct the survey of lending institutions from there.

PROFESSOR STEWART Professor of Farm Management at Lincoln since 1963, Professor Stewart will assume the directorship of the Agricultural Economics Research Unit upon Professor Philpott's departure. A regular speaker at farmers' meetings and conferences, Professor Stewart is equally well known in Canterbury as the team co-selector of the successful Ranfurly Shield holders.

MR STANBRIDGE The son of an English cereals farmer, Mr Stanbridge has come to New Zealand under the terms of a British Commonwealth Scholarship, after gaining survey experience in England. After completion of the Farmer Survey, Mr Stanbridge will move to Wellington to conduct work amongst the lending institutions. He will be responsible for the writing of the final report.

NORTH ISLAND FIELD OFFICERS



K. BRYAN: born on a cream supply dairy farm near Rotorua, Mr Bryan has had extensive practical experience of dairying and sheepfarming in all areas of New Zealand. He has spent a year in Malaysia on V.S.A. Service, and has many outdoor interests. Mr Bryan is studying for a degree in Agriculture.



W.K. BURGE: educated at Wellington College, Mr Burge is studying for a degree in Agriculture. He has had practical farm training in all types of farming from Northland to Southland. An active participant in student affairs, Mr Burge has been elected as Vice President of the Students' Association for 1971/2.



R.W. MOORE: Son of a dairy, sheep and cattle farmer near Christchurch, Mr Moore is another degree student. He has had useful experience as a research assistant in agronomy and on a mixed cropping farm. A Canterbury representative rugby player, and former athletics representative, Mr Moore is a keen outdoor sportsman.



K. McGLASHEN: Home in Motueka and educated at Nelson College, Mr McGlashen has a strong farming background and has had varied practical sheep, dairying and cropping experience in both Islands. A third year degree student, specialising in economics and farm management, he is also an active sportsman.

An Exploratory Investigation
into the Farm Credit Market in New Zealand
(Abstract of Ph.D. thesis by R.J. Stanbridge)

This thesis describes some of the workings of the farm credit market in New Zealand. It attempts to provide a basic source of material for policy makers as well as fulfilling a reference function for future researchers.

The increasing reliance of the farm sector on external sources of finance, and the relative importance of borrowed funds to the sector is described. Description is facilitated through an analysis, from published and unpublished data, of the sources and uses of funds in the sector between 1945/6 and 1968/9.

Some aspects of the demand for funds by the farm sector are examined within the auspices of the "farm firm". The theoretical "firm" concept is discussed in the behavioural rather than the economic context, and a framework of farm firm goals and utility streams is developed. This framework is used as the basis for a simple random sample survey of 381 farm businesses throughout New Zealand. The survey concludes that the changing goal and utility structure of farm operators over time will influence the demand for and use of borrowed funds by them. A "life cycle" phenomenon is observable in the New Zealand farm sector. From survey results the availability of funds is observed to be a major demand shifter.

Results also suggest that there is an inherent element of debt aversion in the farm sector though this is not moralistic in nature. In addition, the average farm operator has not been observed to have experienced difficulties in obtaining finance. There are, however, problems at the margin.

Trading banks, stock firms and the State Advances Corporation, three major sources of finance to the farm sector, are examined under a set of prepared market efficiency criteria. Rationing devices most frequently quoted in the literature, such as interest rates and security requirements, are of secondary importance in the New Zealand farm sector. Partly as a result of institutional constraints imposed by the Authorities, "deposits" and "trading business" have assumed a high priority in the rationing of funds to farmers. Funds availability is the major consideration of the State lending institution. All three markets examined are qualitatively observed to harbour inefficiencies. These have resulted from limited use of marginal pricing methods and structural market imperfections.

Concepts that emerged as important in the field investigations are briefly examined further. The examination is basically theoretical, though some policy suggestions are made. These concepts are the farm firm life cycle; the problem of resource allocation in the imperfect market; the farm ownership and the interest rate concept. Some suggestions are also made for future research in the field.