



AgEcon SEARCH
RESEARCH IN AGRICULTURAL & APPLIED ECONOMICS

The World's Largest Open Access Agricultural & Applied Economics Digital Library

This document is discoverable and free to researchers across the globe due to the work of AgEcon Search.

Help ensure our sustainability.

Give to AgEcon Search

AgEcon Search

<http://ageconsearch.umn.edu>

aesearch@umn.edu

*Papers downloaded from **AgEcon Search** may be used for non-commercial purposes and personal study only. No other use, including posting to another Internet site, is permitted without permission from the copyright owner (not AgEcon Search), or as allowed under the provisions of Fair Use, U.S. Copyright Act, Title 17 U.S.C.*

Farm business analysis

GIANNINI FOUNDATION OF
AGRICULTURAL ECONOMICS
LIBRARY

NOV 20 1972

AUGUST 1972



UNIVERSITY OF EXETER

A GROSS MARGIN APPROACH TO THE ANALYSIS OF FARM FINANCIAL DATA

B. R. Nixon and W. J. Dunford

AGRICULTURAL ECONOMICS UNIT
LAFROWDA
ST GERMAN'S ROAD
EXETER
DEVON

REPORT NO. 187
30p

A GROSS MARGIN APPROACH TO THE
ANALYSIS OF FARM FINANCIAL DATA

Based on an Identical Sample of
Farm Management Survey Farms in
South West England
1968/69 to 1970/71

by

B. R. Nixon

and

W. J. Dunford

FOREWORD

"Accounting as an end in itself has no attractions for the practical farmer. It must be a direct means to the attainment of some definitely useful purpose if it is to make any appeal to the man whose interests are very largely centred in crops and stock, which are often not only the source of his profits, but the basis of his reputation as a farmer as well". Thus wrote J.S. King in the introduction to his book "Cost Accounting Applied to Agriculture" a half a century ago. While interest in, and an appreciation of farm recording and account keeping is much more widespread today than was the case only a few years back, this side of farming has little more attraction for the modern farmer than it had for his father. This despite the very considerable attention which has been given to the development and popularising of methods of recording, account analyses and the application of farm business facts to the management of the farm.

This situation stems partly from the fact that farm accounting is still "an irksome and rather monotonous business" but perhaps more so from the difficulties inherent in the farming process: "... the organic nature of the farming business, its processes being the exploitation of living organisms which require the maintenance of suitable conditions for development, and a consequent dependence on natural forces a state of affairs in which limiting factors of an uncontrollable kind are constantly in operation, and in which a balance of activities must be maintained; conditions which are to a great extent eliminated in factory industry where inert material is being dealt with in a controlled environment the farmer's problem is the grouping of activities within a circumscribed field" This complexity of the farming process is greatly increased if we consider the wide-ranging circumstances, both geo-physical and historical, under which farming is carried on which have combined to produce a great range in farming systems and types of farms.

Little wonder that there has grown up many schools of thought concerning what was the most appropriate accounting systems for farming. Volumes have been devoted to this subject. Obviously the system advocated must take cognizance of the purposes for which accounts are required. For the farmer, "a good system of accounts should enable him to analyse the past and the present in a way that will give definite indications of what may or should not be done ... Farm records and accounts, analysed properly, should form the basis for answering the most important managerial questions

of what to grow and to rear and how to do it most efficiently...." The policy maker needs much the same kind of information for the agricultural industry as a whole. Over the past forty years the trend in farm management accounting practices has been largely in the hands of the agricultural economist which is understandable since, according to H.C. Taylor, "the function of the agricultural economist is to throw light on the pathway of the farmer and the agrarian statesman".

It is in the detailed aims and objectives of account keeping that controversy has arisen. In their early role as farm management advisers, agricultural economists were divided into the "whole farm approach" school on the one hand, and the "cost accounting" school on the other - admirably summarised by King thus: "The difference between book-keeping and cost accounting should be definitely understood. Book-keeping is the keeping of records that will set forth the income, cost, and profit of the business as a whole or complete unit; cost accounting involves the finding of cost, returns, and profit on production units - on a pound of beef, a quart of milk, a bushel of grain The business farmer wishes to know how much he is making or losing on his business each year, how much he is making or losing on each crop or class of animal, and how he can improve his business so as to make more money".

The special nature of the farming process, to which reference has already been made, presented the proponents of the "cost accounting" school with very real problems when they came to apply their system to the actual business of farming. King had already hinted that modifications of accepted systems might be called for. "Scientific method in accounting, as in any other brand of human activity, is only perfected by a process of trial and error. No scientific weapon was ever forged that proved entirely suitable under trial and that could not be sharpened on the wheel of critical discussion To that end, where weaknesses may have been established in existing methods, new lines of approach to the same problems have been suggested It is proposed to eliminate some of the wearisome labour of apportionment without, it is hoped, any loss of vital information.."

Indeed, in the U.S.A., where farm accounting for management was developed much earlier than in this country, we find H.C. Taylor, as early as 1905, strongly advocating modification of the cost accounting approach which, at that time, could be defined as the determination of the individual product cost and the separation of the profit and losses on the several

branches of the farm activities (as distinguished from the keeping of ordinary financial books of account). In his (Taylor's) view, "the cost system should be confined to a few comparisons at a time, otherwise it becomes too much involved. If the comparison is between corn and tobacco, simply charge each of these crops for all it gets in the way of labour and supplies accounts of this kind are invaluable because they show which of two more profitable crops will add the greater amount to the total profits of the farm. It should be kept in mind that in agriculture the purpose of cost accounts is not to find out the specific cost of the different products but to ascertain the relative profitableness of the different types of farming and the different competing elements in each type of farming. Not cost but relative profitableness is the basis of answering all the economic questions in farm management". This development in concept considerably narrows the gap between the two schools. The gap is made narrower still if, in arriving at the same point of view, the approach is made from the basis of the whole farm account. J. M. Saulnier hints at this possibility when, in suggesting this narrower use for cost accounts, as advocated by Taylor, he adds that the intention is "to extend, but not to replace, ordinary financial accounts...."

For many and varied reasons, in the United Kingdom it was the whole farm approach - in the form of the Farm Management Survey, supplemented by enterprise costings - which was to be accepted at the national level as the official means of obtaining data on farming for advisory and policy purposes. However, with the intensification of advisory work from 1950 onwards, the limitations in the whole farm approach became increasingly obvious and, in accordance with King's philosophy of modification and adaptation, resort was made to "new lines of approach" which resulted, among other developments, in the incorporation into the financial account of the "Gross Margin" concept where "comparison between the variable elements of cost and returns may be sufficient evidence of relative profitableness for practical purposes". The eventual adoption of the gross margin concept within the context of the whole farm approach was certainly not entirely new in United Kingdom experience; for many years this had been the scheme of accounting advocated in Northern Ireland by Liversage. What practice has surely taught, however, following this adoption, is that, if the gross margin concept is to win a wider measure of acceptance then its application must essentially be seen as involving a break-down of the whole farm account which, within limits, is capable of independent verification. The concept should not merely be regarded as providing a basis for deriving an appropriate number of separately

constructed components which, in aggregate, might infer a total income position which, if tested, would prove untenable. It is as an exercise in the implementation of the former of these two approaches that the following report is presented.

August 1972.

S.T. Morris.

CONTENTS

Foreword by S. T. Morris

Section	Page
I Introduction	1
II A Gross Margin Approach to Whole Farm Analysis	3
III Individual Enterprise Performance, 1968/69 to 1970/71	15
IV Margins, Overheads and Incomes	33
V Conclusion	36
APPENDIX: Definitions	40

ACKNOWLEDGEMENTS

In order to obtain the information on which this report is based it was necessary to seek again the help of co-operators within the continuing Farm Management Survey. To those who provided such help this Unit extends its sincere thanks.

The nature of the analysis which has been undertaken has also made additional demands on both field and office staff and, in this connection, the authors would like to express their thanks to D.G. Balogh, G.D.D. Davies, G. Kerr and K.G. Tyers for their part in collecting the data presented in the report and to Miss Kathleen Cornelius, Miss Pamela Hexter and W.L. Rook for their efforts in processing the material.

INTRODUCTION

The main purpose of the Farm Management Survey for many years has been to provide a continuing source of information concerning the trend in the profitability of different types of farming within the national farm leaving the profitability of individual farm enterprises to be determined, in the main, by other surveys. One of the primary reasons for this long-standing division of function lay in the understandable difficulty in finding, in adequate numbers, co-operators who would be willing to keep sufficiently detailed records to permit the varying objectives of existing surveys being attained by means of a single, all-embracing survey. Nevertheless, it was generally recognised that the additional information obtainable from an expanded financial analysis of the whole farm on a gross margin basis⁽¹⁾ would greatly assist in the explanation of changes in farm income over time and, as a consequence, an interest in the eventual possibility of an enterprise approach to the analysis of Farm Management Survey material was maintained.

In 1965, therefore, a pilot survey was initiated within the continuing Farm Management Survey⁽²⁾ which required a sub-sample of co-operators to keep physical records relating to the enterprise usage of a limited range of farm materials and to crop and livestock transfers from one enterprise to another. The data provided by these records, after appropriate translation into financial terms, were then used to amplify the normally prepared annual accounts.

Among the benefits to which, it was hoped, this expanded form of account analysis would give rise were:

- a) the possibility it provides for a more detailed explanation of farm income trends and the assessment of farm enterprise performance;
- b) the opportunity it provides for the derivation of additional standards for farm business planning;

(1) See "Planning on the Farm" by D. B. Wallace and H. Burr (Report No. 60, Agricultural Economics Unit, University of Cambridge) for a useful discussion of the principles underlying the gross margin concept.

(2) Ministry of Agriculture, Fisheries and Food, "Farm Management Survey Gross Margins Pilot Survey 1966", January 1969.

- c) its usefulness as a means of inter-farm comparison of the relative efficiencies achieved in the performance of a given enterprise;
- d) its value to the individual co-operator as a source of performance figures relating to his own farm.

It is from the South Western representatives in the sub-sample of Farm Management Survey farms participating in the Ministry's pilot gross margin scheme that the data presented in this report has been drawn.

II

A GROSS MARGIN APPROACH TO WHOLE FARM ANALYSIS

In the early stages of its development, the gross margin technique was primarily used in farm management analysis to assess the effect of postulated changes in enterprise size on the individual farm. Employed in this context, the concept of gross margins took into account any identifiable item within the cost structure of the farm concerned which was considered to vary in a direct sense with the size of its constituent enterprises: for example, seeds, fertilisers, sprays, feedingstuffs, veterinary expenses, casual labour and contractor's services. However, in any attempt to utilise the technique for comparative purposes, one is immediately confronted with the fact that the full range of such costs is not common to all farms, and furthermore, that cost elements such as casual labour and contractor's charges are frequently substitutes for regular labour and machinery inputs which are normally regarded as forming part of the overhead, or fixed, cost structure.

In modifying the gross margin approach for collective analysis, therefore, it has been necessary to define as variable only those items which are generally common to the cost structures of all farms with similar enterprises: that is, to the material items of seeds, fertilisers and sprays for crop production, and of purchased or home-grown concentrate feedingstuffs and veterinary inputs for livestock production. In this way a measure of comparability of data relating to both gross margins and overhead (or fixed) costs has been achieved albeit at the expense of some departure from the strict definition of the gross margin concept. Thus, in undertaking the analysis described later in this report, each component farm account has been analysed as follows:

Individual Enterprises

Enterprise Output

Less Material Costs

{ Seeds, both purchased and home-grown
Fertilisers and sprays
Purchased feedingstuffs and home-grown
cereals fed
Veterinary expenses

= Enterprise "Gross Margin"

Whole Farm

Farm "Gross Margin" (Total of Enterprise "Gross Margins")

Less Overhead (Fixed) Costs

Total labour
Rent and rates
Machinery
Miscellaneous costs

= Net Farm Income

By acknowledging the practical difficulties inherent in any attempt to undertake a full cost analysis on an enterprise basis and by adopting a modified approach which requires co-operators to keep only a minimum of records relating to the enterprise use of materials, it was hoped that a sufficient measure of co-operation would be forthcoming from farmers and in the event the aid of 40, out of a total provincial sample of some 230 farmers was enlisted. Each of these 40 farmers agreed to keep diaries relating to their crop and livestock enterprises while a field worker would visit the farm twice a year to help with any interim difficulties. Few problems were, in fact, encountered with the crop diaries but experience with the livestock enterprise diaries was less successful particularly where the farmer undertook the milling and mixing of his own feed rations. In cases of the latter, discrepancies - often attributable to the inadvertent omission from the diaries of entries relating to feed mixes - invariably emerged when reconciliation with annual input data, derived by the adjustment of recorded purchases for opening and closing stock positions, was attempted. However, by analysing merchants' invoices in some detail at the data processing stage, the allocation of materials on an enterprise basis was reliably achieved for all but seven of the original sample of 40 farms, failure to complete an allocation for these seven being almost entirely due to deficiencies in milling and mixing records which could not be rectified.

In the light of the experience gained with the pilot sample, subsequent practice has been to ask farmers co-operating in the Gross Margin Survey to keep records only in respect of those feedingstuffs fed by them to more than one class of stock. Feedingstuffs which are utilised by only one enterprise, having once been identified by the farmer, can be allocated from a scrutiny of the invoices at the time the account is processed. While this has inevitably meant some additional office work the procedure has worked reasonably well and the survey sample, in the most recently completed year, has been increased to 67, of which 55 provide the identical sample for the years 1968/69, 1969/70 and 1970/71 on which this report is

based.

Composition of Three-Year Identical Sample

The 55 farms included in the sample exhibit a wide range in farm size measured in terms of both adjusted⁽¹⁾ acreage and Standard Man Day requirements. This is demonstrated by Table 1 from which it can be seen that while, in 1968/69, 18 of the farms were under 100 acres in size, nine were of 300 acres or over. Similarly, 14 possessed a labour requirement of less than 600 S.M.D.'s while there were five farms with a requirement of at least 2,400 S.M.D.'s. However, the average farm size for the sample for the first of the three study years was, in terms of acreage, 192 and, in terms of S.M.D.'s, 1,195.

Comparable data for 1970/71, also shown in Table 1, show that the average size of farm in terms of acres had increased by only about five per cent (from 192 to 202 acres) but that in terms of S.M.D. requirements an increase of some 11 per cent (from 1,195 to 1,326 S.M.D.'s) was recorded between 1968/69 and 1970/71 indicating a measure of increased intensity of production.

Comparison of data for the gross margin sample of farms with similar data for the regional sample of F.M.S. farms (Table 1) shows the smaller sample to reflect, in general, the characteristics of the parent sample particularly as far as their distribution by S.M.D. grouping is concerned. In terms of acres, however, the gross margin sample tends to provide a somewhat greater representation of farms at either end of the acreage size range principally at the expenses of the 100-199 acre group.

In the gross margin sample of 55 farms, dairy farms tend to be better represented than general livestock farms but, with the majority of the dairy farms engaging in one or more other livestock enterprises, all of the main livestock enterprises were covered by the sample. Evidence of this is provided by Table 2. Also shown, for the two years, 1968/69 and 1970/71, are the total acreages of the various crops and the total numbers of livestock pertaining to the sample in these two years, together with average crop acreages and average livestock numbers calculated both on a "per farm" and a "per enterprise" basis.

(1) Total acreage after adjustment of rough grazings to a pasture equivalent.

The figures reveal a decline in the number of farms with cereal enterprises and in the number of those with sheep, pigs and poultry enterprises but, perhaps not unexpectedly, the representation of the dominant dairy and "other cattle" enterprises remained unchanged. However, the total acreage of wheat and oats increased so substantially, despite a decline in the number of participating farms, that the average size of these two enterprises increased by 36 and 66 per cent respectively. Among the livestock enterprises a similar effect is to be seen in respect of the pig enterprise where the increase in total enterprise output, with fewer contributing enterprises, was such that average enterprise size in terms of output increased by 89 per cent, although as a measure of change in physical size, the latter figure is clearly inflated to the extent that pig prices rose during the period under review. The average size of the dairy and the "other cattle" enterprises, as measured by the numbers of the appropriate livestock, also increased, by 12 and 20 per cent respectively, as total numbers of stock rose within a constant number of enterprises. Of the remaining livestock enterprises sheep numbers and poultry output both fell in total; but whereas, in the case of sheep, the recorded decline, in conjunction with the fall which occurred in the number of recorded enterprises, resulted in a slight apparent rise in the average size of enterprise, in the case of poultry the decline in total numbers was sufficiently great to result in a fall of 15 per cent in the average size of enterprise notwithstanding fewer participating enterprises.

Changes in Net Farm Income and in Gross Margins

The extension of analysis made possible by the application of a gross margin approach to Farm Management Survey data permits a more detailed explanation of changes in net farm income by shedding more light on the underlying changes which have taken place in the component items of output and costs. At this point it may be appropriate to correct again the popular misconception which tends to equate gross margins with profit. It will be clear from what has been said earlier that gross margins involve only a partial allocation of costs (even though it be a major one) which requires overhead, or fixed, costs still to be charged before a measure of profit or net farm income is determined.

Table 3 shows that, over the three-year period from 1968/69 to 1970/71, the average net farm income of the sample of 55 farms increased by £880 per farm, the net effect of an increase in the whole farm gross margin of £1,867 partly offset by an increase in farm overhead costs of £987 per farm.

Table 1. Comparison of the Composition of the Identical Gross Margin Sample and of the Parent Sample of F.M.S. Farms in South West England

1968/69 and 1970/71

Size Group	Gross Margin Sample (55 farms)				F.M.S. Sample (222 farms)	
	1968/69		1970/71		1970/71	
	Number	Per cent	Number	Per cent	Number	Per cent
<u>Acres:</u>						
Under 100 acres	18	33	18	33	61	28
100 - 199 $\frac{3}{4}$ "	16	29	15	27	83	37
200 - 299 $\frac{3}{4}$ "	12	22	12	22	42	19
300 acres and over	9	16	10	18	36	16
All Farms	55	100	55	100	222	100
<u>S.M.D's:</u>						
Under 600	14	26	9	16	49	22
600 - 1199	21	38	23	42	93	42
1200 - 1799	9	16	10	18	39	18
1800 - 2399	6	11	6	11	20	9
2400 and over	5	9	7	13	21	9
All Farms	55	100	55	100	222	100
Total Acreage	10566		11127		42526	
Average Size: Acres	192		202		192	
S.M.D's	1195		1326		1220	

Note: S.M.D's represent standard labour requirements measured in Standard Man Days.

Table 2.

Number and Size of Selected Gross Margin Enterprises within the Identical
Sample of 55 F.M.S. Farms in South West England

1968/69 and 1970/71

Enterprise	Number of Farms with Stated Enterprise		Size of Enterprise/Sample Farms							
	1968/69	1970/71	Total		Average for all farms			Average for farms with enterprise		
			1968/69	1970/71	1968/69	1970/71	% change 1968/69 to 1970/71	1968/69	1970/71	% change 1968/69 to 1970/71
Wheat	12	11	(acs.) 442	(acs.) 555	(acs.) 8	(acs.) 10	+ 26	(acs.) 37	(acs.) 50	+ 36
Barley	34	31	2113	1882	38	34	- 11	62	61	- 2
Oats and mixed corn	14	14	274	441	5	8	+ 61	20	32	+ 66
Potatoes	7	7	122	129	2	2	+ 6	17	18	+ 6
Forage	55	55	7582	8082	138	147	+ 7	138	147	+ 7
Dairy cows	47	47	(cow nos.) 2904	(cow nos.) 3240	(cow nos.) 53	(cow nos.) 59	+ 12	(cow nos.) 62	(cow nos.) 69	+ 12
Other cattle	49	49	(1'stk nos.) 1624	(1'stk nos.) 1949	(1'stk nos.) 30	(1'stk nos.) 35	+ 20	(1'stk nos.) 33	(1'stk nos.) 40	+ 20
Sheep	22	19	(ewe nos.) 2881	(ewe nos.) 2541	(ewe nos.) 52	(ewe nos.) 46	- 12	(ewe nos.) 131	(ewe nos.) 134	+ 2
Pigs	20	16	(£.E.O.) 52282	(£.E.O.) 79173	(£.E.O.) 950	(£.E.O.) 1440	+ 51	(£.E.O.) 2614	(£.E.O.) 4948	+ 89
Poultry	17	10	13550	6795	246	123	- 50	797	679	- 15
All Farms	55	55	10566 acs.	11127 acs.	192 acs.	202 acs.	+ 5	192 acs.	202 acs.	+ 5

£.E.O. = Enterprise Output.

One-third of this overall increase in overhead costs is seen to have resulted from rising labour costs which increased, on average, by £371 per farm, or 21 per cent. This compares with an increase in machinery costs of 16 per cent. In 1968/69, labour and machinery had occupied approximately the same level of importance in the structure of overhead costs. The charge for rent and rates, which generally accounts for about 20 per cent of overhead costs, showed the least increase over the three-year period (12 per cent) while the composite charge for miscellaneous unallocatable items, as the smallest component of overheads, showed the largest rise (27 per cent). In the case of this latter category, two observations may be of relevance. First, as Table 3 reveals, the increase occurred almost entirely between the first two years of the three-year period reflecting, perhaps, the uneven nature of much of the expenditure in this category which includes expenses incurred in connection with the maintenance of property; and second, the magnitude of the overall increase serves to emphasise the difficulty of containing levels in what is a relatively small yet significant area of costs. Nevertheless, there is some evidence, as was mentioned in the most recent Farm Management Survey Report,⁽¹⁾ to suggest that farmers have at least succeeded in containing the increase in the general level of overhead costs to a rate somewhat less than might have been expected in view of the extent of the increase in the price of many of the individual component items and of the evidence which exists of increasing size of business.

Having established the trend and composition of the discernible changes in the level of overhead costs in the period 1968/69 and 1970/71, attention can now be turned to an analysis of the changes in the various enterprise margins which, in aggregate, must exceed overhead costs if a surplus in the form of a net farm income is to be available. This analysis shows that cash crops contributed £479 per farm and grazing livestock a dominating £1,458 per farm to the overall gross margin increase of £1,867 per farm. On the other hand, the joint contribution of "pigs, poultry and miscellaneous" fell, mainly as a result of the miscellaneous component. The trend in the gross margin per farm in the case of the intensive pig and poultry enterprises corresponds broadly with the respective changes which occurred in the total numbers of pigs and poultry on the sample farms, an increase in the margin from pigs being accompanied by a decrease in that from poultry.

(1) Farm Management Survey: Summary of Financial Results, 1969/70 and 1970/71. Agricultural Economics Unit, University of Exeter, December, 1971, page 10.

Within the two main groups of contributing enterprises - cash crops and grazing livestock - there was considerable variation in the effect on the overall position exerted by individual enterprises. Wheat and potatoes were the major contributors to the total change in the gross margin derived from cash cropping, the share of the former amounting to £191 and that of the latter to £130. The contribution of grazing livestock, which was the main constituent in the change in the whole farm gross margin was in turn dominated by the change in the gross margin for the dairy enterprise which alone accounted for £1,260 out of the total grazing livestock figure of £1,458.

The importance of the dairy-dominated grazing livestock sector within the described changes in the gross margin pattern for this sample of Farm Management Survey farms reflects the dominating part played by grazing livestock in the agricultural economy of the South West. In 1968/69, this broad category of livestock utilised 72 per cent of the farmed land of the sample holdings and contributed almost 74 per cent of their aggregated gross margins; by 1970/71 these proportions had risen slightly to 73 per cent and 75 per cent respectively.

The "other cattle" enterprise proved only a relatively minor contributor to the increase in the overall gross margin level for grazing livestock while the contribution of the sheep enterprise actually proved to be a negative one, a fall in gross margin of £27 per farm being recorded.

Factors in Changing Gross Margin Levels

At this stage of the analysis an examination of some of the factors responsible for the observed changes in gross margins and in the level of overall farm income would seem desirable even if the extent of that examination is necessarily limited. An attempt has, therefore, been made here to assess that proportion of the observed changes in gross margins which might reasonably be assigned to changes in the size of the respective enterprises within the aggregate sample farm. Any residual element of those changes can then be attributed to the combined effects of product and input price changes, changes in the efficiency of material use, and changes in seasonal factors which reflect themselves in yields. The method adopted involved the application of the average gross margin performance figures for 1968/69, for the various selected enterprises, to changes in the average size of these enterprises as measured by the appropriate physical units. The procedure assumes, of course, that no great variation in the efficiency with which material resources are processed is likely to result from changes

Table 3.

Average Levels of Enterprise and Whole Farm Gross Margins
and of Overhead Costs for 55 F.M.S. Farms
1968/69, 1969/70 and 1970/71

	1968/69		1969/70		1970/71		Change from 1968/69 to 1970/71	
	Per farm	Per cent	Per farm	Per cent	Per farm	Per cent	Per farm	Per cent
	£		£		£		£	
Enterprise Margins:								
Wheat	221	3	317	4	412	4	+ 191	+ 86
Barley	951	11	1246	13	1007	10	+ 56	+ 6
Oats and mixed corn	177	2	257	3	261	2	+ 84	+ 48
Potatoes	166	2	375	4	296	3	+ 130	+ 78
Other cash crops	78	1	113	1	96	1	+ 18	+ 23
All Cash Crops	1593	19	2308	25	2072	20	+ 479	+ 30
Dairy cows	4701	55	4935	53	5961	57	+1260	+ 27
Other cattle	1111	13	1216	13	1398	14	+ 287	+ 26
Sheep	404	5	370	4	377	4	- 27	- 7
Other forage output	114	1	43	-	52	-	- 62	- 44
All Graz., L'stk. & Forage	6330	74	6564	70	7788	75	+1458	+ 23
Pigs	315	4	341	4	381	4	+ 66	+ 21
Poultry	81	1	44	-	36	-	- 45	- 56
Miscellaneous	179	2	85	1	88	1	- 91	- 51
Whole Farm Gross Margin	8498	100	9342	100	10365	100	+1867	+ 22
Overhead Costs:								
Labour	1765	33	1908	32	2136	34	+ 371	+ 21
Rent and rates	1153	21	1273	21	1293	20	+ 140	+ 12
Machinery and power	1712	32	1873	31	1986	31	+ 274	+ 16
Miscellaneous	754	14	929	16	956	15	+ 202	+ 27
Total Overhead Costs	5384	100	5983	100	6371	100	+ 987	+ 18
Net Farm Income	3114	-	3359	-	3994	-	+ 880	+ 28
Tenant's Capital	13733	-	15204	-	16580	-	+2847	+ 21

Table 4.

Composition of Changes in Gross Margins Per Farm
By Enterprise
1968/69 and 1970/71

Enterprise	Change in Gross Margin per Farm		
	Total change	Estimated change due to change in enterprise size ⁽¹⁾	Residual change attributed to other factors ⁽²⁾
	£	£	£
Wheat	+ 191	+ 58	+ 133
Barley	+ 56	- 104	+ 160
Oats and mixed corn	+ 84	+ 106	- 22
Potatoes	+ 130	+ 7	+ 123
Other cash crops	+ 18	n.c.	n.c.
Total Cash Crops	+ 479	n.c.	n.c.
Dairy cows	+ 1260	+ 543	+ 717
Other cattle	+ 287	+ 222	+ 65
Sheep	- 27	- 47	+ 20
Other forage output	- 62	n.c.	n.c.
Total Grazing Livestock Forage Output	+ 1458	n.c.	n.c.
Pigs, Poultry and Miscellaneous	- 70	n.c.	n.c.
Whole Farm Gross Margin	+ 1867	n.c.	n.c.

(1) Based on changes in crop acreages and livestock numbers assuming no change from 1968/69 unit levels of gross margin performance.

n.c. = not calculable.

(2) See text.

in enterprise size of the magnitude encountered in the sample.

As an example, wheat acreage increased on average by just over two acres per farm. The application of the average gross margin per acre of wheat for the 1968 harvest year, £27.5, to this change in wheat acreage indicates that some £58 of the difference between the average gross margins for wheat in 1968/69 and 1970/71 (which, as Table 3 shows, amounted to £191) was accounted for by the size factor and £133 by factors other than the expansion of the acreage grown. In contrast, the acreage devoted to potatoes within the sample farm changed only slightly. Consequently, almost the entire recorded change in the gross margin for this crop within the sample can be attributed to the net effect of prices, efficiency in variable resource use, and seasonality factors.

The results of applying this technique over the range of selected gross margin enterprises are set out in Table 4. With the average number of dairy cows per farm rising by some 12 per cent, increased enterprise size is seen as contributing 43 per cent of the increase of £1,260 in the gross margin per farm for the dairy enterprise which occurred between 1968/69 and 1970/71, leaving rather more than half to be accounted for by changes in prices, efficiency in the use of variable factors and yields. In the case of "other cattle", an increase in the number of stock emerges as the dominant factor in the increased enterprise gross margin apparently accounting for more than three-quarters of the change. For the sheep enterprise, without the moderating effect of other factors, the fall in ewe numbers would have undoubtedly resulted in a much greater fall in gross margin per farm than was actually recorded.

It will be noted that pigs and poultry have been excluded from this type of analysis as the variation in the systems of production which is encountered within these enterprises precludes any satisfactory basis for measuring enterprise size. The pig enterprise, for example, includes not only breeding systems but systems devoted exclusively to the fattening of store stock. The change in the contribution of pigs and poultry to the total gross margin of the sample (together with that of the small miscellaneous element) has therefore been recorded only in its aggregate form, as has the change in the normally negative margin attributable to the forage acreage.

Having thus made some assessment of the contribution made by the shift in emphasis within the enterprise "mix" of the sample to the change

in the "whole farm" gross margin for the group, attention can be directed to an examination of the relative importance for each of the land using enterprises, of other factors in determining changes in average gross margin levels between the years 1968/69 and 1970/71.

III

INDIVIDUAL ENTERPRISE PERFORMANCE

1968/69 to 1970/71

In this section, an assessment of the factors contributing to the changing level of performance of individual enterprises will be seen to have been made in terms of an acre of the appropriate crop in the case of the cropping enterprises and in terms of the appropriate animal unit in the case of the livestock enterprises.

Wheat (see Tables 5a and 5b)

Winter and spring wheat together represented some five per cent of the total farmed acreage of the sample in 1970/71 but contributed only four per cent of the "whole farm" gross margin for the sample (see Tables 2 and 3). Nevertheless, this still constituted a substantial improvement in performance compared with 1968/69, the gross margin per acre for wheat on the farms in the sample growing this crop having increased, as Table 5a shows, from £27.5 to £40.8, an increase of more than £13.0 per acre.

A number of factors are seen to have contributed to this improved performance not the least being the effect of increased wheat prices (including deficiency payments) which is reflected by an increase of 21 per cent in the measured monetary output per hundredweight of cereal yields. At the same time average physical yields recorded for 1970/71 were some 13 per cent above those for 1968/69 while overall material costs per acre slightly decreased due to a fall, amounting to five per cent, in fertiliser costs per acre.

In Table 5b a comparison is made, for 1970/71, between the average enterprise gross margin performance of all the wheat growing farms in the sample and the average reported by premium performance farms, the latter being identified as the "top" one-third of the sample when its component farms are ranked in ascending order according to their enterprise margins per acre. Also shown is the range in the performance figures achieved by the sample.

The wide variation in enterprise margin per acre is seen to stem from the pronounced fluctuation found within the sample in both output and cost factors and, perhaps not surprisingly, the premium farms show themselves at

an advantage on all, or nearly all, measured counts. Their higher average yield (34 cwt. per acre) combined with a slightly higher unit return (£1.6 per cwt. yield) and a materials cost figure of £8 per acre to give them an average enterprise margin of £45 per acre. As reference to subsequent sections will show, this result gives an advantage to wheat as a crop over the premium performances of other cereals. However, as a result of its more stringent physical requirements, there is probably a tendency to confine its cultivation to the more limited acreage of better soils.

It should be added that in cases where it is deemed appropriate to value the straw crop, the gross margin of the enterprise would be increased accordingly.

Barley (see Tables 6a and 6b)

The importance of barley, both in terms of the proportion of the farmed acreage of the sample devoted to the crop (17 per cent) and its contribution to the sample's whole farm gross margin (10 per cent), declined in 1970/71 compared with 1968/69 when the comparable figures were 20 per cent and 11 per cent. The fall in acreage, incidentally, was largely due to the decision of a few farmers with only small barley acreages to abandon it completely as a crop.

In contrast to this apparent decline in the crop's importance, the gross margin per acre for barley increased from £24.7 in 1968/69 to £29.4 in 1970/71 although this latter figure still represented a fall from the exceptionally high figure of £32.5 recorded for 1969/70. In 1969/70 and 1970/71 the levels of gross margin achieved were due primarily to the high returns attainable by barley producers as a result of the favourable price and deficiency payment levels which prevailed although performance in 1969/70 was assisted by an average physical yield which was better than that obtained in the other two years which proved to be relatively poor from a barley-growing standpoint. A contributory factor to the drop in gross margin per acre from the high levels of 1969/70 was the increased incidence of material costs - notably seeds and fertilisers - which, on average, rose by 10 per cent.

The one-third of the barley growers showing better records of gross margin performance achieved a higher average yield and higher average returns from the sale of their crop than their less successful fellow co-operators, factors which more than compensated for the higher level of costs

Table 5a

Measures of Average ⁽¹⁾ Gross Margin Performance
For All Farms with Wheat Enterprise

WHEAT

1968/69, 1969/70 and 1970/71

	1968/69	1969/70	1970/71	Change from 1968/69 to 1970/71
<u>Financial Measures Per Acre</u>	£	£	£	%
Enterprise Output ⁽²⁾	35.7	41.4	48.8	+ 37
Cost of Materials:				
Seeds	3.1	3.7	3.2	+ 3
Fertilisers	4.3	3.8	4.0	- 5
Sprays	0.8	0.7	0.8	-
Total Materials	8.2	8.2	8.0	- 2
Gross Margin	27.5	33.2	40.8	+ 48
<u>Other Measures</u>				
Yield (cwt. per acre)	27.9	32.6	31.4	+ 13
Enterprise output per cwt. yield (£)	1.3	1.3	1.6	+ 21
Acreage devoted to enterprise	442	524	555	+ 26
Number of farms with enterprise	12	12	11	- 8
Average size of enterprise (acres)	37	44	51	+ 37

(1) Weighted average based on total enterprise acreage.

(2) Excludes any imputed value of straw.

Table 5b

Comparison of Gross Margin Performance for All Farms
With Wheat Enterprise and High Performance Farms

1970/71

	All Farms		Average ⁽¹⁾ for High Performance Farms
	Average ⁽¹⁾	Range	
<u>Financial Measures Per Acre</u>	£	£	£
Enterprise Output ⁽²⁾	47.1	35-57	53.4
Cost of Materials:			
Seeds	3.3	1.9-6.0	3.0
Fertilisers	4.1	1.7-6.4	4.2
Sprays	0.8	0.0-1.4	0.8
Total Materials	8.2	6.3-11.7	8.0
Gross Margin	38.9	23-48	45.4
<u>Other Measures</u>			
Yield (cwt. per acre)	31.4	24-40	34.3
Enterprise output per cwt. yield (£)	1.5	1.3-1.9	1.6
Size of enterprise (acres)	51	6-96	50

(1) Simple average of individual enterprise measures.

(2) Excludes any imputed value of straw.

Table 6a

Measures of Average ⁽¹⁾ Gross Margin Performance
For All Farms with Barley Enterprise
1968/69, 1969/70 and 1970/71

BARLEY

	1968/69	1969/70	1970/71	Change from 1968/69 to 1970/71
<u>Financial Measures Per Acre</u>	£	£	£	%
Enterprise Output ⁽²⁾	31.5	39.2	36.9	+ 17
Cost of Materials:				
Seeds	2.3	2.4	2.6	+ 13
Fertilisers	3.7	3.6	4.1	+ 11
Sprays	0.8	0.7	0.8	-
Total Materials	6.8	6.7	7.5	+ 10
Gross Margin	24.7	32.5	29.4	+ 19
<u>Other Measures</u>				
Yield (cwt. per acre)	25.0	27.5	25.1	+ 1
Enterprise output per cwt. yield (£)	1.3	1.4	1.5	+ 17
Acreage devoted to enterprise	2113	2110	1882	- 11
Number of farms with enterprise	34	32	31	- 9
Average size of enterprise (acres)	62	66	61	- 2

- (1) Weighted average based on total enterprise acreage.
(2) Excludes any imputed value of straw.

Table 6b

Comparison of Gross Margin Performance for All Farms
With Barley Enterprise and High Performance Farms
1970/71

	All Farms		Average ⁽¹⁾ for High Performance Farms
	Average ⁽¹⁾	Range	
<u>Financial Measures Per Acre</u>	£	£	£
Enterprise Output ⁽²⁾	32.7	15-49	43.8
Cost of Materials:			
Seeds	2.9	1.3-6.0	2.9
Fertilisers	3.8	1.3-8.6	4.3
Sprays	0.7	0.0-1.4	0.9
Total Materials	7.4	4.2-14.3	8.1
Gross Margin	25.3	11-41	35.7
<u>Other Measures</u>			
Yield (cwt. per acre)	23.5	12-34	27.9
Enterprise output per cwt. yield (£)	1.4	1.0-1.7	1.6
Size of enterprise (acres)	61	5-322	87

- (1) Simple average of individual enterprise measures.
(2) Excludes any imputed value of straw.

which they appeared to incur. These higher costs, of course, should not be directly associated with the achievement of higher yields as heavier fertiliser and spray usage may stem from rotational requirements on the premium farms which in size tended to be larger than the average for the sample.

Again, the wide range in performance both in terms of output and costs must be emphasised and attention again drawn to the supplementary effect on gross margin performance which would result from any valuation of the straw yield.

Oats (see Tables 7a and 7b)

The acreage of oats and mixed corn showed some increase over the three-year period although in 1970/71 it claimed only some four per cent of the total sample acreage and contributed just over two per cent of the whole farm gross margin. On average, the yield of oats was consistently higher than that of barley over the three-year period but was higher than that of wheat only in the first year of the investigation period, thereafter showing a fall. This pattern in relative yield levels is largely repeated in a comparison of the gross margin performance of the three cereal enterprises; an eight per cent increase in material costs over the period in the case of the oat enterprise counterbalanced an increase of seven per cent in the value of output per cwt. yield to make the fall in average yield a determining factor in the gross margin performance of the crop.

The importance of yield as a factor in gross margin performance is also suggested by the measures for 1970/71 appropriate to the more successful of the oat growers whose yields, on average, were substantially higher than those for "all farms" while their average level of material costs was little different from, and their average level of output per cwt. yield actually slightly lower than, the comparable level for the parent sample.

However, the wide range in performance encountered in this, as in the other cereal enterprises, serves to emphasise the caution with which average measures should be employed as standards, particularly, for example, where the incorporation of the crop into a farming system is being considered as a new venture.

Potatoes (see Tables 8a and 8b)

With only a relatively small number of the sample farms growing potatoes this crop accounted for a very small proportion (some one per cent) of the total farmed acreage of the sample but, for the farms concerned, the presence of the crop can have a significant effect on income due to the very wide yearly fluctuations in gross margin per acre to which the crop is prone.

Over the period 1968/69 to 1970/71 the total acreage of potatoes grown by the sample farms increased very slightly and, with yields and material costs per acre also varying only to a modest extent, the principal factor in fluctuating margins would seem to be that of average sale price as revealed by changes in the enterprise output per ton yield which varied from a little under £13 in 1968/69 to just over £22 in 1969/70 and to rather less than £18 in 1970/71.

The overriding importance of commodity price in the case of this crop is reflected again by a comparison of the average performance for all farms in 1970/71 with that of the high performance farms for the same year, a comparison which also demonstrates the small differences in average crop yields and material cost levels which are clearly insufficient to account for the revealed difference in gross margin performance.

It is interesting to note that seed costs are by far the most significant of the material cost components while the prevalence of farm gate sales within the pattern of disposals seem to be the main factor in the achievement of higher average levels of unit returns.

Dairying (see Tables 9a and 9b)

Although it cannot claim to be statistically representative of the entire region, the present identical sample, with 47 of its total of 55 farms containing a dairy herd, can at least provide an indication of recent trends in an enterprise which is of primary importance to the farming economy of the South West. For example, while the proportion of the farmed acreage of the sample which dairy cows utilised remained relatively constant, their contribution to the whole farm gross margin increased, as was shown in Table 3, from 55 per cent in 1968/69 to 57 per cent in 1970/71. Moreover, the total size of the sample herd increased by 12 per cent but, with the stocking rate of the farms on which these dairy cows were found showing an

Table 7a

Measures of Average ⁽¹⁾ Gross Margin Performance
For All Farms with Oats and Mixed Corn Enterprise

OATS AND MIXED CORN

1968/69, 1969/70 and 1970/71

	1968/69	1969/70	1970/71	Change from 1968/69 to 1970/71
<u>Financial Measures Per Acre</u>				
Enterprise Output ⁽²⁾	£ 42.9	£ 43.0	£ 40.3	% - 6
Cost of Materials:				
Seeds	2.7	3.1	3.1	+ 15
Fertilisers	3.5	3.2	3.8	+ 9
Sprays	0.9	0.7	0.8	- 11
Total Materials	7.1	7.0	7.7	+ 8
Gross Margin	35.8	36.0	32.6	- 9
<u>Other Measures</u>				
Yield (cwt. per acre)	32.5	31.7	28.6	- 12
Enterprise output per cwt. yield (£)	1.3	1.4	1.4	+ 7
Acreage devoted to enterprise	266	388	441	+ 66
Number of farms with enterprise	14	14	14	-
Average size of enterprise (acres)	19	28	32	+ 66

(1) Weighted average based on total enterprise acreage.

(2) Excludes any imputed value of straw.

Table 7b

Comparison of Gross Margin Performance for All Farms
With Oats and Mixed Corn Enterprise and High Performance Farms

1970/71

	All Farms		Average ⁽¹⁾ for High Performance Farms
	Average ⁽¹⁾	Range	
<u>Financial Measures Per Acre</u>			
Enterprise Output ⁽²⁾	£ 38.9	£ 21-52	£ 45.5
Cost of Materials:			
Seeds	3.1	1.5-4.6	2.6
Fertilisers	3.8	2.0-4.9	3.9
Sprays	0.7	0.0-1.1	1.0
Total Materials	7.6	5.3-9.4	7.5
Gross Margin	31.3	16-45	38.0
<u>Other Measures</u>			
Yield (cwt. per acre)	27.8	13-40	33.5
Enterprise output per cwt. yield (£)	1.4	1.3-1.5	1.4
Size of enterprise (acres)	32	4-117	39

(1) Simple average of individual enterprise measures.

(2) Excludes any imputed value of straw.

Table 8a

Measures of Average ⁽¹⁾ Gross Margin Performance
For All Farms with Potato Enterprise
1968/69, 1969/70 and 1970/71

POTATOES

	1968/69	1969/70	1970/71	Change from 1968/69 to 1970/71
<u>Financial Measures Per Acre</u>	£	£	£	%
Enterprise Output	125.5	208.0	175.7	+ 40
Cost of Materials:				
Seeds	32.6	29.8	33.0	+ 1
Fertilisers	12.0	11.7	11.7	- 3
Sprays	6.0	5.8	5.7	- 5
Total Materials	50.6	47.3	50.4	- 1
Gross Margin	74.9	160.7	125.3	+ 67
<u>Other Measures</u>				
Yield (tons per acre)	9.7	9.4	10.0	+ 3
Enterprise output per ton yield (£)	12.9	22.1	17.6	+ 36
Acreage devoted to enterprise	122	129	130	+ 7
Number of farms with enterprise	7	7	7	-
Average size of enterprise (acres)	17	18	19	+ 6

(1) Weighted average based on total enterprise acreage.

Table 8b

Comparison of Gross Margin Performance for All Farms
With Potato Enterprise and High Performance Farms
1970/71

	All Farms		Average ⁽¹⁾ for High Performance Farms
	Average ⁽¹⁾	Range	
<u>Financial Measures Per Acre</u>	£	£	£
Enterprise Output	165.8	120-237	228.4
Cost of Materials:			
Seeds	27.9	18.0-38.0	31.2
Fertilisers	13.7	10.4-17.0	12.8
Sprays	5.2	0.0-11.2	7.4
Total Materials	46.8	32.0-55.4	51.4
Gross Margin	119.0	73-182	177.0
<u>Other Measures</u>			
Yield (tons per acre)	9.7	8-11	10.6
Enterprise output per ton yield (£)	16.9	14.1-22.0	21.5
Size of enterprise (acres)	19	1-56	22

(1) Simple average of individual enterprise measures.

improvement from 1.4 acres to 1.3 acres per cow, the acreage of the sample "farm" supporting them has increased, in absolute terms, by only six per cent.

Overall performance, measured in terms of average gross margin per dairy cow, increased over the three years from £89 to £101: that is, by 14 per cent. In terms of gross margin per acre it increased from £63 to £75 (20 per cent). These trends were achieved by an expansion of enterprise output per cow to which an increase in the price of milk and an increase in average milk yield (from 868 to 897 gallons) contributed. Milk sales per cow, in fact, increased over the period by £13 to £154 the difference in this latter figure and the figure of £157 recorded for enterprise output per cow in 1970/71 being accounted for by the additional output resulting from the excess of calf prices over the charge for herd depreciation. The comparable figure for this element of output additional to milk sales per cow was a small negative amount in 1968/69 due to lower calf prices.

In view of the rate of increase in the unit cost of concentrates in the 1970/71 winter and the increase in average milk yields recorded in the final year of the period it is perhaps surprising that the increase in concentrate costs per cow has been contained to an annual level of less than five per cent, the overall rate of increase from 1968/69 to 1970/71 being 10 per cent. As the concentrate bill forms such a dominant part of total material costs (inclusive of fertilisers) its control has clearly been a significant factor in increasing the dairy enterprise margin.

Veterinary costs have been treated in this and in other livestock enterprise analysis as an item of material costs because of their close relationship with production. While representing only some eight per cent of the total cost of materials they can be seen to have increased over the period of the study at a faster rate than other costs (by 19 per cent). It is impossible to say, however, to what extent this increase was due to increased veterinary charges or to the increased demand for veterinary services consequent upon a rising incidence of veterinary problems.

Forage costs per acre over the period as a whole have shown no increase despite the improvement recorded in the rate of stocking and the general increase in fertiliser prices in the same period. In total, however, material costs (concentrates, veterinary costs and forage costs) increased from £51.4 to £55.6 per acre - an increase of some eight per cent.

With dairy gross margins for individual farms within the sample ranging from £72 to £149 per cow and from £38 to £176 per acre the scope for improving the contribution of this enterprise to the whole farm gross margin for the sample would appear to be considerable and, with dairying already the major enterprise on the preponderance of farms in the South West, the effect on their average level of income could well be considerable.

Marked variation is visible in most of the contributing elements to the gross margin measure of performance: enterprise output, for example ranged from £107 to £238 per cow while the charge for concentrates, which were the major item of material costs, varied from £17.1 to £91.3 per cow.

While it may be tempting to infer from the figures relating to the designated high performance farms that high yields must inevitably be a feature of such farms, inspection of the individual farm results indicated that this is not necessarily the case and that disproportionately high levels of material use may entirely negate the beneficial effects of high yields while relatively low yields associated with commensurately modest levels of material use were still capable of giving rise to adequate margins over material and forage costs. Thus, included in the high performance farms, when farms in the sample are ranked by gross margin per cow, is one farm with an average yield of only 714 gallons per cow but a gross margin of £114 per cow. In contrast, the farms classed in the same ranking exercise as being of low performance contain one farm with an average yield of 1,031 gallons per cow but a gross margin of only £81 per cow.

As one would expect, some yearly variation in the performance of individual farms is encountered and, in fact, of the farms classified as having achieved a high performance in 1970/71 in respect of their dairy enterprise, only half of them enjoyed such a position in 1968/69. However, some 70 per cent of the farms classified for 1970/71 as falling within the one-third of the sample containing the poorest performances were found to have occupied a corresponding position in 1968/69.

Where land is the limiting resource farmers may prefer to measure their standards of performance on a "per acre" rather than a "per cow" basis and for this reason both bases have been employed in the accompanying tables relating to the dairy enterprise. When ranked according to their gross margin performance per acre the reconstituted high performance group is found to contain only about a half of those farms assigned to the premium group on

Table 9a

Measures of Average ⁽¹⁾ Gross Margin Performance
For All Farms with Dairy Enterprise
1968/69, 1969/70 and 1970/71

DAIRY COWS

	1968/69	1969/70	1970/71	Change from 1968/69 to 1970/71
Financial Measures Per Cow	£	£	£	%
Enterprise Output	140.5	141.5	156.8	+ 12
Cost of Materials:				
Concentrates	37.3	38.8	40.9	+ 10
Veterinary costs	3.2	3.7	3.8	+ 19
Margin over Concentrates and Veterinary Costs	100.0	99.0	112.1	+ 12
Forage Costs	10.9	11.1	10.9	-
Gross Margin	89.1	87.9	101.2	+ 14
Gross Margin Per Acre	62.7	63.9	75.3	+ 20
Other Measures				
Yield (galls. per cow)	868	859	897	+ 3
Stocking rate (forage acres per cow)	1.4	1.4	1.3	- 7
Milk sales per cow (£)	141	140	154	+ 9
Milk price per gall.(p)	16.2	16.3	17.1	+ 6
Total number of cows in enterprises	2903	3087	3240	+ 42
Number of farms with enterprise	47	47	47	-
Average size of herd	62	66	69	+ 12

(1) Weighted average based on total number of cows in enterprises.

Table 9b

Comparison of Gross Margin Performance for All Farms
With Dairy Enterprise and High Performance Farms

1970/71

	All Farms		Average ⁽¹⁾ for High Performance Farms	
	Average ⁽¹⁾	Range	By margin per cow	By margin per acre
Financial Measures Per Cow	£	£	£	£
Enterprise Output	158.4	107-238	183.1	175.4
Cost of Materials:				
Concentrates	42.5	17.1-91.3	47.1	48.9
Veterinary costs	3.8	0.7-7.6	4.5	4.1
Margin over Concentrates and Veterinary Costs	112.1	72-156	131.5	122.4
Forage Costs	9.9	- 4.7-23.3	8.3	12.0
Gross Margin	102.2	72-149	123.2	110.4
Gross Margin Per Acre	78.5	38-176	89.4	102.5
Other Measures				
Yield (galls. per cow)	895	620-1294	1006	982
Stocking rate (forage acres per cow)	1.4	0.8-2.6	1.5	1.1
Milk sales per cow (£)	155	108-230	177	170
Milk price per gall.(p)	17.3	15.2-22.1	17.6	17.3
Size of herd	69	10-227	57	64

(1) Simple average of individual enterprise measures.

Table 10a

Measures of Average ⁽¹⁾ Gross Margin Performance
For All Farms with "Other Cattle" Enterprise

OTHER CATTLE

1968/69, 1969/70 and 1970/71

	1968/69	1969/70	1970/71	Change from 1968/69 to 1970/71
<u>Financial Measures Per L.U.</u>	£	£	£	%
Enterprise Output	71.1	69.2	74.7	+ 5
Cost of Materials:				
Concentrates	23.5	21.7	24.5	+ 4
Veterinary costs	1.3	1.5	1.7	+ 23
Margin over Concentrates and Veterinary Costs	46.3	46.0	48.5	+ 5
Forage Costs	8.7	9.2	9.0	+ 3
Gross Margin	37.6	36.8	39.5	+ 5
Gross Margin Per Acre	25.6	25.2	27.6	+ 8
<u>Other Measures</u>				
Stocking rate (forage acres per L.U.)	1.5	1.5	1.4	- 3
Total number of L.U.'s in enterprises	1624	1816	1949	+ 20
Number of farms with enterprise	49	48	49	-
Average size of enterprise (L.U.'s)	33	38	41	+ 20

(1) Weighted average based on total number of L.U.'s in enterprises.

Table 10b

Comparison of Gross Margin Performance for All Farms
With "Other Cattle" Enterprise and High Performance Farms

1970/71

	All Farms		Average ⁽¹⁾ for High Performance Farms	
	Average ⁽¹⁾	Range	By margin per L.U.	By margin per acre
<u>Financial Measures Per L.U.</u>	£	£	£	£
Enterprise Output	70.4	27-110	85.4	81.9
Cost of Materials:				
Concentrates	21.4	1.5-54.3	23.4	23.2
Veterinary costs	1.5	0.4-7.4	1.4	1.2
Margin over Concentrates and Veterinary Costs	47.5	17-81	60.6	57.5
Forage Costs	9.6	0.8-20.5	7.7	8.0
Gross Margin	37.9	7-67	52.9	49.5
Gross Margin Per Acre	27.2	6-49	36.2	38.5
<u>Other Measures</u>				
Stocking rate (forage acres per L.U.)	1.4	0.8-2.7	1.5	1.3
Size of enterprise (L.U.'s)	41	9-122	47	43

(1) Simple average of individual enterprise measures.

the basis of their performance per cow, the complement of the group being maintained by other farms whose performance in terms of stocking rates overrides their less satisfactory standard of performance measured on a "per cow" basis. Thus, for these latter farms, yields on average amount to 982 gallons per cow and enterprise output to £175 per cow, measures which, with somewhat higher concentrate and forage cost levels (£49 and £12 per cow respectively) result in a gross margin per cow of £110, some £13 less than the figure obtained on average by those farms where the "per cow" measure of performance was made the basis of the ranking procedure. A stocking rate of only 1.1 acres per cow, however, results in the achievement of a gross margin per acre of £102.

In view of the wide variation in herd size (from 10 to 227 cows) found on the 47 farms during the three years of the study, attempts were made to ascertain the existence of a direct relationship between herd size and gross margin per cow or gross margin per acre but this could not be discerned because of the wide variations in performance which were found to occur within the selected herd-size groups. It should not be construed from this that an individual farmer, on expanding his herd size, need necessarily expect his level of performance to remain unchanged as the outcome of such a policy will certainly be affected, in the first instance, by his personal managerial ability. Nevertheless, it might suggest that, for any given standard of management, any increased efficiency in the use of resources as a consequence of herd expansion is more likely to arise from the more effective spread of overhead costs such as labour and machinery than from the more productive combination of materials.

Other Cattle (see Tables 10a and 10b)

Notwithstanding the marked differences which may exist between the labour and the capital requirements of "other cattle" as an enterprise and those of dairy cows, the difference in their respective margins is very striking. Moreover, the relative movement in those margins over the three years 1968/69 to 1970/71 would appear to suggest that the difference is not narrowing.

Certainly the range in performance of the "other cattle" enterprise appears greater than for any other enterprise but this is no doubt attributable to the fact that within the enterprise so designated is to be found a wide variety of systems which range from the very extensive - with a very slow rate of turnover - to the very intensive. The higher performance

farms, by their results expressed both on a "per acre" and a "per livestock unit" basis, indicate the importance of achieving greater output (net of livestock purchases and cost of transfers) as their relative success appears to have been attained with few additional material costs but the smallness of the sample effectively precludes any association of better results with a particular system of production.

The failure of the margin from cattle rearing to increase, in the three years to 1970/71, as much as one might have been led to expect by the trend in the sale prices of cattle over this period is perhaps explained by several factors. First, to the extent that buoyant cattle prices reflect themselves in the realised value of young calves, this benefit has been transferred to the dairy enterprise with which it is usual to credit the value of the calf. Second, the increase in cattle prices, in the period concerned, tended to relate to beef cattle rather than to calving heifers whereas the "other cattle" results include both systems of rearing. Inspection of the individual records for this enterprise did reveal, in fact, that the few specialist beef rearers in the sample had, on average, increased their margins from a position somewhat below the average for farms specialising in dairy replacements to one of comparative advantage. With the more recent rise in the value of dairy heifers, however, this may have proved only a temporary situation.

It should be noticed that the various livestock categories found within the "other cattle" enterprise make it necessary, in determining densities of stocking, to employ a standard unit of measurement in respect of livestock numbers, the livestock unit. This is based on the estimated food requirements of a dairy cow, the livestock unit factors for the other categories of livestock being determined by the proportional relationship of their respective estimated food requirements to this standard.⁽¹⁾ Expressed in terms of livestock units, therefore, the average size of the "other cattle" enterprise is seen to have increased by more than 20 per cent in the three years from 1968/69, while the enterprise output per livestock unit increased by some five per cent over the three years to nearly £75 in 1970/71. At this latter level, however, it still only amounted to approximately half the comparable enterprise output figure for one dairy cow which increased by some 12 per cent in the same period. Thus, while the cost of concentrates and, indeed, of materials generally, despite the rate of increase

(1) See the Appendix for the Scale of Livestock Units actually employed.

Table 11a

Measures of Average ⁽¹⁾ Gross Margin Performance
For All Farms with Sheep Enterprise
1968/69, 1969/70 and 1970/71

SHEEP

	1968/69	1969/70	1970/71	Change from 1968/69 to 1970/71
<u>Financial Measures Per Ewe</u>	£	£	£	%
Enterprise Output	10.6	10.3	10.6	-
Cost of Materials:				
Concentrates	1.2	1.2	1.2	-
Veterinary costs	0.4	0.5	0.4	-
Margin over Concentrates and Veterinary Costs	9.0	8.6	9.0	-
Forage Costs	1.4	1.4	1.3	- 3
Gross Margin	7.6	7.2	7.7	+ 1
Gross Margin Per Acre	23.2	22.4	25.3	+ 9
<u>Other Measures</u>				
Lambs reared per ewe	1.3	1.2	1.2	- 10
Stocking rate (ewes per forage acre)	3.1	3.1	3.3	+ 7
Fat lamb price (£ per lamb)	7.1	7.3	8.1	+ 14
Wool sales (£ per ewe)	1.9	1.7	1.7	- 11
Wool sales (lbs. per ewe)	10.1	8.8	9.1	- 9
Total number of ewes in enterprises	2622	2559	2450	- 7
Number of farms with enterprise	16	16	16	-
Average size of flock	164	160	153	- 7

(1) Weighted average based on total number of ewes in enterprises. Farms with winter fattening of hoggets have been excluded.

Table 11b

Comparison of Gross Margin Performance for All Farms
With Sheep Enterprise and High Performance Farms

1970/71

	All Farms		Average ⁽¹⁾ for High Performance Farms	
	Average ⁽¹⁾	Range	By margin per ewe	By margin per acre
<u>Financial Measures Per Ewe</u>	£	£	£	£
Enterprise Output	10.9	7-16	14.4	13.5
Cost of Materials:				
Concentrates	1.3	0.3-3.0	1.8	1.8
Veterinary costs	0.3	0.1-1.0	0.4	0.3
Margin over Concentrates and Veterinary Costs	9.3	5.0-13.8	12.2	11.4
Forage Costs	1.3	0.4-2.7	1.6	1.4
Gross Margin	8.0	2-12	10.6	10.0
Gross Margin Per Acre	26.7	8-43	35.4	36.5
<u>Other Measures</u>				
Lambs reared per ewe	1.2	0.9-1.6	1.4	1.4
Stocking rate (ewes per forage acre)	3.3	2.3-4.1	3.4	3.7
Fat lamb price (£ per lamb)	8.1	6.5-9.4	8.6	8.5
Wool sales (£ per ewe)	1.9	0.7-3.0	2.2	2.2
Wool sales (lbs. per ewe)	10.3	3.6-19.3	11.9	11.2
Size of flock	153	38-360	146	136

(1) Simple average of individual enterprise measures. Farms with winter fattening of hoggets have been excluded.

Table 12a Measures of Average⁽¹⁾ Gross Margin Performance GRAZING LIVESTOCK AND FORAGE CROPS
For All Farms with Grazing Livestock and Forage Crop Enterprise
 1968/69, 1969/70 and 1970/71

	1968/69	1969/70	1970/71	Change from 1968/69 to 1970/71
<u>Financial Measures Per Acre</u>	£	£	£	%
Gross Margin Contribution From:				
Dairy cows (excl. forage crops)	38.3	38.5	44.9	+ 17
Other cattle (excl. forage crops)	9.9	10.5	11.7	+ 18
Sheep (excl. forage crops)	3.4	2.9	2.9	- 16
Sundry forage crop output	0.2	- 0.2	- 0.1	n.m.
Total	51.8	51.7	59.4	+ 15
Material Costs of Forage Crops:				
Seeds	0.6	0.7	0.7	+ 25
Fertilisers	5.1	5.5	5.5	+ 6
Sprays	0.1	0.1	0.2	+ 22
Total Materials	5.8	6.3	6.4	+ 9
Gross Margin	46.0	45.4	53.0	+ 15
<u>Other Measures</u>				
Total acreage of grazing enterprises	7582	7944	8082	+ 7
Total livestock units	5103	5448	5697	+ 12
Stocking rate (forage acres per L.U.)	1.5	1.5	1.4	- 5
No. of farms with grazing enterprises	55	55	55	-

(1) Weighted average based on total forage acreage.

n.m. = not meaningful

Table 12b Comparison of Gross Margin Performance for All Farms
With Grazing Livestock and Forage Crop Enterprise and High Performance Farms
 1970/71

	All Farms		Average ⁽¹⁾ for High Performance Farms
	Average ⁽¹⁾	Range	
<u>Financial Measures Per Acre</u>	£	£	£
Gross Margin Contribution From:			
Dairy cows (excl. forage crops)	48.9	0-147	78.8
Other cattle (excl. forage crops)	10.9	0-39	11.3
Sheep (excl. forage crops)	2.5	0-14	-
Sundry forage crop output	- 0.3	-11-+28	- 3.4
Total	62.0	22-144	86.7
Material Costs of Forage Crops:			
Seeds	0.7	0.0-2.4	0.7
Fertilisers	5.5	1.2-14.7	7.6
Sprays	0.1	0.0-0.9	0.2
Total Materials	6.3	1.7-16.4	8.5
Gross Margin	55.7	19-133	78.2
<u>Other Measures</u>			
Stocking rate (forage acres per L.U.)	1.4	0.8-2.7	1.1
Forage acres per farm	147	25-433	123

(1) Simple average of individual performance measures.

recorded for veterinary costs, did not rise substantially, the overall gross margin per livestock unit for "other cattle" increased by only five per cent, to just under £40, and the gross margin per acre by eight per cent, to just under £28.

Sheep (see Tables 11a and 11b)

The reduction in the number of ewes in the gross margin sample tended to follow the trend in sheep numbers both in the South West generally and at the national level. The overall gross margin per ewe, moreover, has not increased by as much as the 14 per cent increase in fat lamb prices might suggest, some of the benefit which the latter might have imparted having been offset by a decline of some 10 per cent in the number of lambs reared per ewe. Declines in the quantity and value of wool sales per ewe were recorded both of which were, again, of the order of 10 per cent.

Material costs did not rise measurably over the period even though the sheep had been more intensively stocked with 3.3 ewes to the acre in 1970/71 compared with 3.1 in 1968/69.

The upper limits of the recorded ranges in performance of this enterprise indicate that, with satisfactory standards of management, sheep are still capable of making a worthwhile contribution to the whole farm gross margin. Among the high performance flocks, for example, better lambing and stocking rates, heavier wool clips and higher product prices all combined to more than offset increased material inputs. As a result, average gross margins of approximately £10 per ewe and £36 per acre were recorded for these farms irrespective of the basis adopted for their performance classification.

All Grazing Livestock and Forage Crops (see Tables 12a and 12b)

The total gross margin per forage acre for the aggregated grazing enterprises, measured before the deduction of forage costs, rose from £52 in 1968/69 to over £59 in 1970/71 representing an increase of 15 per cent. This improvement can be seen to have resulted from increases in the gross margin contributions from dairy cows and from "other cattle". Sheep, however, while not a major contributor to the whole farm gross margin of the sample, recorded a decline in their contribution of some 16 per cent.

The output from forage crops fell from a small positive amount (£0.2 per acre) to a small negative amount (£-0.1 per acre) due to the overall fall

in forage stocks disclosed by the opening and closing inventories for the three-year period and an increase in the volume of purchased fodder, principally in the form of hay.

The material costs of forage production increased, in total, by nine per cent from 1968/69 to 1970/71, reflecting the increase of six per cent in the main item of fertilisers rather than the more marked increases which occurred in the relatively less important items of seeds and sprays. But, overall, the increase in the material costs of forage crops was insufficient to disturb the trend in the final gross margin per forage acre for the sample which also showed an increase of 15 per cent over the three-year period - from £46 to £53 per acre.

Any comparison of standards of performance within the sample for a given year is difficult because of the varying combinations of grazing livestock enterprises which are encountered. These are clearly reflected in the range of measures which was reported. However, while the one-third of the sample farms with the best performances in respect of gross margin per forage acre show a margin contribution from "other cattle" which, at £11.3 per acre, is only slightly above the average for all farms (£10.9 per acre), their margin from dairy cows at £78.8 per acre, was some 60 per cent above the average for all farms of £48.9 per acre. In terms of stocking rate the performance of the better farms was markedly in advance of that for all farms but such comparisons should be interpreted with caution in view of the widely varying levels of capital resource use associated with different systems.

IV

MARGINS, OVERHEADS AND INCOMES

In previous sections of this report, levels of gross margin performance for individual enterprises found within an identical sample of Farm Management Survey Farms have been examined for the three-year period from 1968/69 to 1970/71. These margins clearly constitute very important component factors in the general level of income which is eventually established but, for individual farms, income levels must also depend upon the nature of the enterprise "mixes" which are adopted; upon the relative importance of the various enterprises within these "mixes"; and upon the level of overhead costs with which the selected enterprise pattern is associated.

The smallness of the present sample unfortunately precludes any detailed investigation of these important determinants of farm income levels but a broad examination of the levels within the sample of whole farm gross margins, overhead costs and net farm incomes for 1970/71 may, nevertheless, serve to indicate profitable areas for future farm income analysis.

Whole farm gross margins, expressed on a "per acre" basis are seen from Table 13a to decline with increasing size of farm at least as far as the class limit of 300 acres. However, such a trend in itself, is not indicative of decreasing productive efficiency but of the increasing importance of high gross margin enterprises (in particular, dairy cows) within the farm economy as acreage becomes a more limiting factor.

Average overhead costs per acre (excluding any imputed charge for the manual labour of the farmer and his wife) for the various size groups show a smaller measure of variation but this conceals contrasting trends in the main components of overhead costs, namely, labour and machinery and power. Labour costs, again excluding any charge for the labour of the farmer and his wife, are seen to rise from £5.9 per acre for the group of farms of less than 100 acres to almost twice that figure (£11.7) for the farms of more than 300 acres while machinery and power costs, over the same range, fall from £13.7 to £9.2 per acre. The other two components of overhead costs which have been distinguished - rent and rates, and miscellaneous unallocated costs - show, when expressed on a "per acre" basis, only a relatively small degree of variation, tending to decline, as one would expect, as size of farm increases.

Table 13a

Whole Farm Gross Margins, Overhead Costs, Net Farm Incomes and
Tenant's Capital Per Acre by Size of Farm

1970/71

Size Group	Number of Farms	Whole Farm Gross Margin(1)	Overhead Costs (1)					Net Farm Income(1)	Tenant's Capital(1)
			Labour (2)	Rent and rates	Machinery and power	Misc.	Total		
		£	£	£	£	£	£	£	£
Under 100 acres	18	66.1	5.9	7.7	13.7	6.8	34.1	32.0	114.5
100-199 $\frac{3}{4}$ "	15	55.3	9.3	6.9	9.5	5.1	30.8	24.5	89.0
200-299 $\frac{3}{4}$ "	12	46.8	10.9	5.9	10.0	4.5	31.3	15.5	78.1
300 acres & over	10	48.8	11.7	6.1	9.2	4.4	31.4	17.4	75.6
All Farms	55	55.8	9.0	6.8	10.9	5.4	32.1	23.7	91.6

(1) Simple average of individual farm measures.

(2) Excludes any charge for labour of farmer and wife.

Table 13b Whole Farm Gross Margins, Overhead Costs and Net Farm
Incomes Per £100 Tenant's Capital by Size of Farm

1970/71

Size Groups	Number of Farms	Whole Farm Gross Margin	Total Overhead Costs(1)	Net Farm Income
		£	£	£
Under 100 acres	18	58	30	28
100 - 199 $\frac{3}{4}$ "	15	63	35	28
200 - 299 $\frac{3}{4}$ "	12	60	40	20
300 acres and over	10	65	42	23
All Farms	55	61	35	26

(1) Excludes any charge for labour of farmer and wife.

Farms will, of course, differ in the intensity of their land use even within broadly similar systems of farming, so that a comparison of their levels of performance on a "per acre" basis may not always be the most apt. In these circumstances it may be more fitting to relate performance to the levels of investment in tenant's capital⁽¹⁾ which will be seen from Table 13a to be at a much higher level per acre for the smaller farms in the sample (measured in terms of their acreage) than for the larger farms where the use of land will inevitably tend to be more extensive. Measured in this way, gross margin performance is seen to vary to a much more limited degree, ranging only from £58 per £100 tenant's capital for the group of smallest farms to £65 for the group of largest units. Table 13b also shows that the incidence of overhead costs tends to be lower for the two groups comprising the smaller farms with the result that the measure of the return on tenant's capital which net farm income provides can be seen to be higher for these groups than for the two groups of larger farms. This measure specifically takes no account of the element of farm overhead costs represented by the labour input of the farmer and his wife which assumes a greater importance within the overall input structure of small farms than of large. If this element were to be included in the overhead costs of the farms in the present sample then, clearly, a radically different picture would emerge. However, in view of the difficulty of imputing reliable monetary values to the farmer and wife's contribution to the manual labour input on any farm and of the disturbing effect which these imputations may subsequently impart to the financial results of small samples of farms, no attempt has been made in this report to use Management and Investment Income (that is, Net Farm Income less a charge for farmer and wife's labour) as a measure of the return on tenant's assets.

(1) See list of definitions set out in the Appendix.

CONCLUSION

This short report has attempted to show how the gross margin approach to the analysis of financial data can perhaps assist in efforts to explain the changing profitability of farming whether the profitability with which one is concerned is that of an individual farm or that of a group of farms. The first part of the report dealt primarily with the "whole farm" situation as this related to a group of Farm Management Survey farms, and with the effect, illustrated in Table 4, of changes in the size and type of enterprises found within the group "farm". The latter part examined the effect, on individual enterprise performance, of prices, seasonality factors in farming, and changes in technical efficiency although no attempt was made to assess the relative importance of these factors in quantitative terms.

The main conclusions in both areas of analysis are capable of being conveniently summarised in a diagram of the kind presented on page 37. This offers a condensed presentation of the contents of earlier tables and records the main reasons for the observed change in the level of income of the sample farms over a period of three years; but, clearly, the approach might, with equal relevancy be applied to any individual farm situation. In the latter circumstances, it might be used as a preliminary means of identifying and highlighting those areas of the farm economy requiring further investigation. Above all, the construction of the diagram emphasises the formal nature of an approach which visualises the determination of enterprise gross margins as a logical extension to "whole-farm" income analysis and not as a series of disparate exercises.

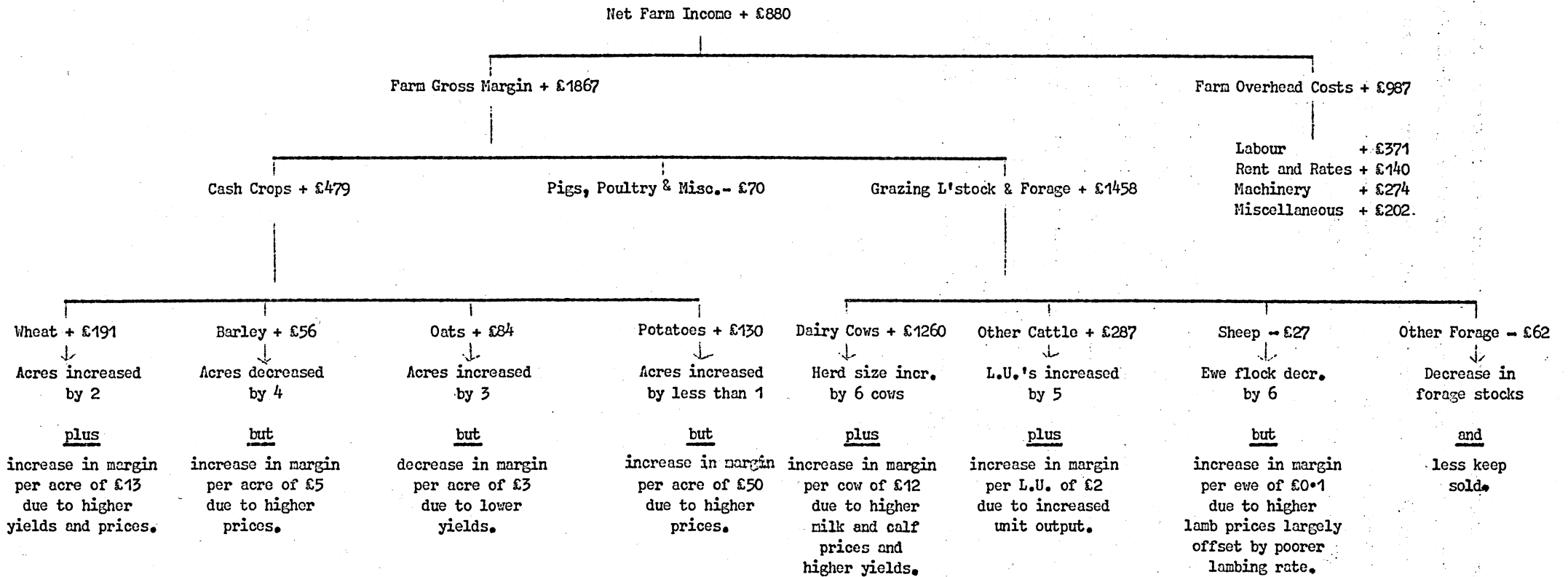
It must be reiterated that the sample of 55 farms employed in this report is in no way to be regarded as statistically representative of the whole region but it does provide an interesting basis for the examination, at the group level, of economic performance over a three-year period (from 1968/69 to 1970/71) within a fairly well-controlled management environment. In brief, Fig. 1 shows that the average "whole farm" gross margin increased by £1,867 (from £8,498 to £10,365) mainly due to the additional contribution of dairy cows as a result of increased herd size, milk yield and product price. Other enterprises - cattle, wheat, oats and potatoes - increased their contribution, again mainly by a combination of increased enterprise size and better product prices, but barley, sheep and the "pigs, poultry and miscellaneous" sector would appear to have made little or no additional contribution.

Figure 1.

Changes in the Determinants of Net Farm Income

1968/69 to 1970/71

(Based on average "per farm" data for a group of 55 Farm Management Survey farms in South West England)



Although some increase in physical yields was reported in the case of wheat and dairy cows, recorded increases in enterprise contributions to the whole farm gross margin appear for the most part to have been due to changes in product prices and enterprise size, while any improvement in technical efficiency would seem to have been achieved mainly by a more economical use of materials at existing levels of yield rather than by improved yield performance.

Over half of the increase in the farm gross margin was absorbed by additional overhead costs which increased by £987 (from £5,384 to £6,371) to which labour, machinery and power, and the composite "sundry" item of costs were the main contributors. The consequent rise of average net farm income by £880 represented an increase of 28 per cent over the three-year period but this achievement can only be properly assessed if related to the fact that, as was recorded in Table 3, investment in tenant's capital also increased by £2,847 per farm, an increase of some 21 per cent.

APPENDIX

DEFINITIONS

ENTERPRISE OUTPUT OF SALE CROPS is the total value of the crop produced, irrespective of its disposal; it equals Returns from the crop (Revenue adjusted for valuation changes) plus the market value of any part of the crop used on the farm. In this report no account has been taken of the value of straw sold or used on the farm.

ENTERPRISE OUTPUT OF LIVESTOCK is Gross Output (total Revenue from livestock and livestock products adjusted for valuation changes, less purchases of livestock and livestock products, plus the value of livestock and livestock products consumed in the farmhouse or supplied without charge to workers) plus or minus (as appropriate) the market value of any inter-enterprise transfer of livestock or livestock products. Enterprise Output includes any relevant production grants.

MATERIAL COSTS comprise, for this report, purchased feedingstuffs and the value of home-grown cereals used as feed on the farm, veterinary and medicine costs, purchased seeds and the value of home-grown corn used as seed on the farm, fertilisers (where directly related to a crop) and sprays.

ENTERPRISE GROSS MARGIN is, for the purpose of this report, Enterprise Output less enterprise Material Costs.

WHOLE FARM GROSS MARGIN is the sum of individual enterprise Gross Margins.

OVERHEAD (FIXED) COSTS comprise labour (excluding that of the farmer and his wife), rent and rates, machinery and power costs, and miscellaneous unallocated costs.

NET FARM INCOME is the Gross Margin for the whole farm less Overhead (Fixed) Costs. It represents the return to the farmer and his wife for their manual labour, management, and investment in farming capital (excluding land and buildings).

STANDARD MAN DAY is the unit (representing eight hours manual work by an adult male worker under average conditions) which is employed to determine standard labour requirements for each crop and class of livestock. Total standard labour requirements for the whole farm, including an addition (normally of 15 per cent) for essential maintenance work, has been used in

this report as one measure of the size of a farm business.

TENANT'S CAPITAL is defined as the average of the opening and closing valuations of all livestock, crops, stores and machinery. It does not include the value of land or fixed landlord-type buildings.

ALLOCATION OF FORAGE COSTS AND FORAGE ACRES TO GRAZING LIVESTOCK has been undertaken by allocating appropriate material costs and forage acres according to the distribution of livestock units between the respective livestock enterprises. The livestock unit factors employed in this report are as follows:

	<u>L. U. Factor</u>
Dairy cows	1.00
Heifers-in-calf and cattle 2 years old and over	0.80
Cattle 1 - 2 years old	0.60
0 - 12 months old	0.40
Ewes (including lambs reared)	0.20

WEIGHTED GROUP AVERAGE ENTERPRISE MARGINS have been determined by aggregating individual enterprise margins for the group and dividing by the total number of crop acres or livestock units involved. Averages weighted in this manner have been used in all comparisons of data between years.

SIMPLE GROUP AVERAGE ENTERPRISE MARGINS have been calculated by dividing the sum of individual enterprise margins, expressed per unit of production, by the number of items (i.e. enterprises) in that sum. Simple averages have been used in the comparison of performances within the group for a given year. Thus each individual standard of enterprise gross margin performance is accorded equal weight in the determination of this average.