A Regional Study of the Relative Prosperity of Irish Farms of different Sizes.

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IN the course of a study of regional allocation in Irish agriculture it became necessary to attempt to estimate regional incomes by farm size for the base year of the study, 1960. The results afforded a considerable number of insights into the prosperity of the various regions and merit reporting in their own right. As such they provide additional information to that provided by other investigators in this field (see references 3 to 10).

The Regions

The study of production allocation required the selection of a limited number of representative farm types. Ideally, these could have been those which emerged from the National Farm Survey of 1955–1958. However, for several reasons associated with programming requirements, this course could not be adopted, e.g. the classification tended to be fluid, there was no national enumeration of numbers of each type, still less any estimates of resources associated with each category. The careful delineation of regions, however, resulted in a reasonable spatial approximation to these main farming types. Furthermore, the seven areas set out on the map can be regarded as a refinement of the three regions of the National Farm Survey.[1] Taking the regions in sequence their predominant farming patterns were: Region 1—subsistence, 2—dairying, pigs, poultry, cattle and some tillage, 3—cattle and sheep mixed, 4—older cattle and livestock on larger farms than in region 3, 5—crops mixed, 6—dairying and cash crops, 7—dairying without cash crops. In each region farms were also subdivided by size into three categories, 15—50 acres, 50—100 acres and over 100 acres.

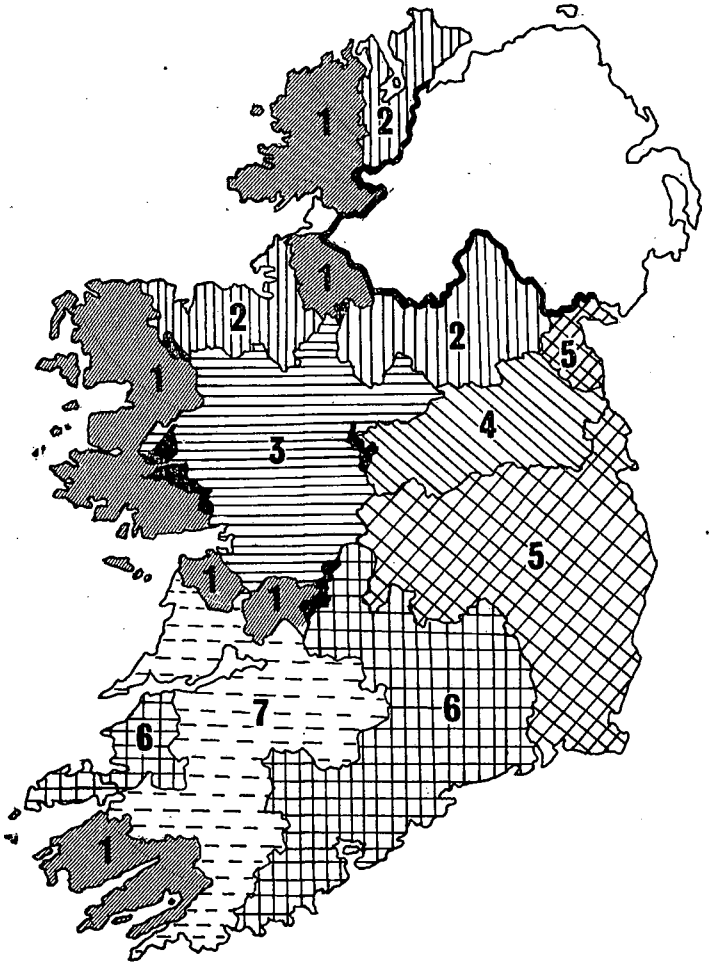
Once regions and representative farms had been selected the next step was to examine the position in the base period, 1960, to obtain an assessment of the

1. The approach used is set out briefly in Note 1 in the Appendix. For a fuller discussion see ref. 1, pages 304–348.

THE SEVEN AGRICULTURAL REGIONS OF IRELAND

Key:

1. *Subsistence.*
2. *Dairying, pigs, poultry, cattle, some tillage.*
3. *Cattle and sheep mixed.*
4. *Older cattle and livestock on larger farms than Region 3.*
5. *Crops mixed.*
6. *Dairying and cash crops.*
7. *Dairying without cash crops.*



relative prosperity and competitive strength of each region. As mentioned earlier this evaluation of 1960 would provide a very desirable yardstick against which to measure the projected changes for 1970 as they emerge from the solution of the allocation model.

There has been considerable debate on the best method of obtaining regional estimates. Regional economists[2] have urged that the differences in policy objectives of regional and national planning warrant independent sources of data for these accounts and some would like to see national accounts aggregated from those of the regions. In practice the reverse procedure is often used, dictated by practical considerations, i.e. estimates of regional income obtained by scaling down the entries in the national accounts.

The debate on procedure discussed by Meyer has its Irish counterpart. In 1959 Byrne[3] made the first attempt to assess changes in the competitive strength of the provinces using a scaling down technique which he called the "allocation method". His approach was criticised by Linehan[4] who suggested two alternative procedures, both grossing up from the results of the farms in the National Farm Survey.[5] Linehan's main complaint, that the allocation method underestimated the output of Munster, has been met to some extent by a revision of the allocation procedure which put the lagging Munster income almost 5 per cent ahead of Leinster.

In deciding which approach to adopt data availability is a prime consideration. Since National Farm Survey data was not collected for 1960 the grossing up method was ruled out. On the other hand the allocation method had been used by Attwood and Geary to calculate country incomes for that year, so this provided a useful point of departure for the regional study. The results obtained could then be checked against the data provided by the final year of the National Farm Survey 1957-8, since, as was mentioned earlier, the regions largely coincide with the predominant farming patterns in the survey.

Regional Output

The allocation method follows the same procedures in arriving at regional income as are used nationally. It consists of finding suitable distributors to allocate each national aggregate on a regional basis. Where national aggregates are built up from county figures this poses no problems, e.g. the output of wheat. Where this is not so appropriate, alternatives must be selected, e.g., number of ewes might be used to distribute the national output of lambs. It might have to be corrected for breed or regional productivity. Since the method used was essentially that of Attwood and Geary, the interested reader is referred to that source for details of the methodology. A few modifications that were made are specified in Note 2 in the Appendix.

2. Meyer, Ref. 2.
3. Byrne, Ref. 3.
4. *Ibid.*, discussion section.
5. The points made by Linehan are discussed briefly in Appendix Note 2.

Nationally farm income is estimated as the balance remaining after costs have been deducted from the revenue derived from output. The revenue figures are built up from the details of each farm enterprise. The costs are also identified individually. In the county income study of 1960, the revenue from farm output for each county was presented in *Table* 3 of that report. In Appendix Table A1 the seven regions have been substituted for the twenty-six counties. To aid in the appreciation of regional farm practices some aspects of output are provided in greater detail. These relate to cattle, milk, sheep, horses and cash crops. Since the level of disaggregation of the first three enterprises was high the details were set out in the lower half of the table to facilitate reading.

It is not proposed, within the limits of this paper, to discuss all the implications of the wealth of information provided in Table A1. Space will only permit certain highlights to be treated, in particular the importance of each region to national output and the composition of output within each region. To facilitate this discussion, Tables 1 and 2 have been derived from the upper section of Table A1, and supplemented with some scaling parameters, since the regions, as defined, are by no means the same size. In total area, three regions are almost three times the size of Region 4 (Meath, Westmeath), and the remaining three about double, as row 11 of Table 1 indicates.

TABLE 1: *Share of National Output of Main Products Contributed by Regions Related to Area*

%

Row	*Regions*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Total*
1	Cattle	8·2	11·7	13·8	10·4	18·7	21·7	15·6	100·0
2	Milk	6·8	9·8	7·2	6·1	13·8	28·6	27·7	100·0
3	Sheep	10·2	7·4	30·6	9·3	23·4	14·6	4·4	100·0
4	Poultry	8·8	18·0	19·4	5·9	15·8	18·1	13·8	100·0
5	Pigs	2·6	13·7	6·8	4·1	20·8	29·9	22·1	100·0
6	Horses	1·0	2·3	2·8	17·1	39·9	23·9	13·0	100·0
7	Crops	6·1	8·8	9·8	5·2	35·9	27·3	6·7	100·0
8	Cash Crops*	0·5	1·1	4·7	5·0	47·9	37·6	3·2	100·0
9	Home Consumption	14·7	14·1	17·8	6·0	16·0	16·5	14·8	100·0
10	Gross Output	6·8	10·9	12·0	7·3	22·2	24·7	16·1	100·0
11	Area	17·9	11·8	13·0	6·3	18·0	18·4	14·5	100·0
12	Crops and Pasture	7·4	12·8	14·2	8·5	19·9	21·7	15·6	100·0

*Defined as wheat, barley and sugar beet.

A comparison of total area and gross output, rows 10 and 11, shows that Region 4 to 7 (Eastern and Southern Ireland) contribute more than their share of gross output, Regions 2 and 3 (North and West) somewhat less; but Region 1 (Congested Districts) contributes only about 38 per cent in relation to its size. The picture

based on area of crops and pasture alone, i.e., rows 10 and 12, shows region 1 in a more favourable light; but in compensation all other regions do less well. In fact, for its size region 1 contributes more to gross output than the richer region 4 of North Leinster, and considerably more than the other regions of the West and North. This may be due to the propensity of small holdings to have high outputs per acre, or, more likely, to the fact that much of the output is from enterprises such as Blackface Sheep, which graze on land too rough to be included as crops and pasture. More will be said on this subject later.

TABLE 2: *Composition of Regional Output by Main Products, (1960)*

%

Row	*Regions*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Total*
1	Cattle	34·0	30·6	32·9	40·5	24·0	25·0	27·6	28·5
2	Milk	21·8	19·6	13·0	18·2	13·5	25·1	37·4	21·8
3	Sheep	10·0	4·6	17·1	8·5	7·1	3·9	1·8	6·8
4	Poultry	9·4	12·0	11·7	5·9	5·2	5·3	6·2	7·2
5	Pigs	4·1	13·5	6·1	6·0	10·1	13·0	14·8	10·8
6	Horses	0·3	0·4	0·4	4·2	3·3	1·8	1·5	1·8
7	Crops	20·0	18·1	18·3	15·8	36·1	24·7	9·3	22·3
8	Cash Crops*	0·8	1·2	4·7	8·1	25·7	18·1	2·4	11·9
9	Home Consumption	30·2	18·2	20·9	11·5	10·1	9·4	12·9	14·0

*Defined as wheat, barley and sugar beet.

As mentioned earlier, there are two ways of considering the data in Table A1. The first is to relate the share of national output arising in the region with the size of the region measured in terms of gross output, total area or area of agricultural land. This was done in Table 1. Table 2 presents the importance of each product to total regional output. Ideally, the first seven items of each column should add up to 100 per cent, the shortfall being attributed to the value of inventory changes.

Turning to an examination of the individual products in the composition of regional income, we find that cattle account for a significant proportion of output in all regions. Apart from region 4, the range in the proportion is quite narrow, moving from 24 per cent in Region 5 (South Leinster) to 34 per cent in Region 1 (Congested Districts) around an average of 28·5 per cent. In the first four regions (North and West generally) their importance to the region was above average, largely due to the absence of alternative crops. In Region 4—the grazing lands of North Leinster—they accounted for over 40 per cent of the total gross output. However, the similarity between regions conceals differences in herd composition. A closer study of Table A1 reveals some aspects of the famous "pilgrimage of the

TABLE 3: *Proportions of Cattle Output Attributable to the Various Classes of Cattle in each Region*

Region	*Calves*	*1–2 years*	*2–3 years*	*3+ years*	*Culled Cows*	*Total*
	%	%	%	%	%	%
1	2·4	15·4	48·4	25·1	8·7	100·0
2	—0·5	20·0	54·8	17·6	8·1	100·0
3	—6·2	14·3	59·7	24·7	7·5	100·0
4	—6·1	—18·3	48·8	66·1	9·5	100·0
5	—2·1	— 1·8	53·8	36·4	13·6	100·0
6	3·7	11·4	52·6	23·4	8·9	100·0
7	9·9	14·9	46·5	21·3	7·4	100·0

Source: Rows 14 to 18 inclusive, Table A1.

Irish bullock". To make this more meaningful, Table 3 was constructed to express the proportion of cattle output derived from the different categories of cattle. The minus values for the two Leinster regions (4 and 5) indicate that they imported both calves and early stores. In region 4—Meath, Westmeath—the predominant source of output revenue was from animals over 3 years old. This was in line with its role as the final fattening area before cattle are shipped out through Dublin. In marked contrast the dairying regions of Munster (6 and 7) were calf exporters with almost 10 per cent of output in the Limerick region coming from calf sales. Like all regions (apart from 4), output was greatest for two-three year olds. East Connacht (Region 3) has the largest import of calves on a percentage basis. Its main output is late stores, probably for fattening in Meath. Region 2—Ulster, Sligo—has a thriving creamery industry, net calf requirements are negligible and the sale of young stores (to Meath, Westmeath?) accounts for a bigger part of output than in any other region. Region 1 contains many areas on the fringe of dairying districts. Its main emphasis is on young stock, exporting calves and early stores to better endowed neighbouring farms for rearing and fattening.

Dairying in general accounted for 21·8 per cent of output. In Regions 3 (Connacht) and 5 (South Leinster) its contribution to regional output was only about 60 per cent of this figure (13—13·5 per cent). A glance at Table 1 shows that over 56 per cent of all milk produced nationally came from the two Munster regions, and although milk in Region 7 represented 37·4 per cent of the region's output, compared with 25·1 per cent in Region 6 (East Munster), the latter, being a bigger area, produced slightly more than half the total of the two regions. As with cattle, these figures do not give the whole story. Added insights into regional patterns can be gleaned by reference to the lower half of Appendix A1. The contribution of each category of milk output to the regional total milk output is presented in Table 4.

TABLE 4: *Percentage Distribution of Milk Output by Main Categories Within Regions, (1960)*

Region	*For Industry*	*Liquid Dublin and Cork*	*Other Liquid Sales*	*Remainder**
1	43·6	—	9·9	46·5
2	55·2	—	9·8	35·0
3	—	0·3	12·0	87·7
4	2·5	54·4	7·9	35·2
5	5·5	35·9	14·5	44·1
6	76·7	5·1	6·5	11·7
7	86·6	—	4·3	9·1
All	55·2	9·8	8·0	27·0

Source: Rows 19 to 24, Table A1.

*Consists of household consumption on farms, farmers' butter, buttermilk and whey.

From this it will be seen that farmers' butter, buttermilk and whey, and milk consumed on the farm represent 27 per cent of output nationally. Whereas in Region 7 (West Munster) they were only a third of this proportion, in Region 3 (East Connacht) the percentage was more than three times this level (85·7 per cent). Since this output is mostly for domestic consumption, milk sales in East Connacht represent a small fraction of total milk output. In Region 4, and to a lesser extent in Region 5 (Leinster generally), milk supplies for the Dublin District Milk Board are the most important commercial outlet. Creamery milk amounts to from three-quarters to seven-eights of the total in Regions 6 and 7 (Munster), and is about average (55·2 per cent. in the northern creamery area—Region 2) This is to be expected from the delineation of these regions.

The regional disparity in sheep keeping is more pronounced, with the contribution to regional output ranging from 1·8 per cent in West Munster (7)—Limerick is almost sheepless—to 17·1 per cent of output in East Connacht (3). The latter accounts for over 30 per cent of national output, followed by South Leinster (5) at 23·4 per cent. Both the congested districts (Region 1) and the North Leinster plain (4) have above average concentrations of sheep, but in the main dairying regions 7, 6 and 2, their economic significance is not great, relative to other enterprises. The impact of sheep in an area depends on the breed, since blackfaced were assumed to have an output of £3·5 per ewe, cheviots £6·6 and other breeds (Downs and Galways) £8·6. Three-quarters of the ewes in Region 1—the congested districts—were blackfaced. In Region 7 this breed accounted for more than half (54 per cent) mainly on the Kerry hills. In fact, almost half (46 per cent) of all blackfaced ewes in Ireland were to be found in Region 1, and almost two-thirds (65 per cent) of the cheviots were to be found in Region 5, predominantly on the Wicklow hills or the nearby areas of Kildare. In this region they accounted for 41·5 per cent of all ewes, somewhat less than the combined Down and Galway breeds (45·8 per cent). In East Galway 83 per cent of all ewes were Galways, and

a further 10 per cent Downs. In Region 4, Galways also predominated—a confirmation of the traditional pattern of Meathmen buying in-lamb ewes in the West for one lambing on the rich lands of the royal county.

Greater emphasis is placed on poultry in the North and West. Their share of regional output in the first three regions is approximately double that of the remaining four. East Connacht (3) is the major source of national output (19·7 per cent), with Ulster (2) not far behind at 18·0 per cent.

Pigs are of particular importance to the three regions engaged in creamery milk production, 7, 2 and 6—the two Munster regions between them produce 52 per cent of national output. Although pigs were not of such relative importance in South Leinster, this region produces almost 21 per cent of national output. The presence of the intensive breeding area of Cavan, Monaghan in Region 2 results in an enhanced output from this region also.

Output of horses is largely confined to Leinster and East Munster, with strong representation from limestone plains of Meath, Kildare and Kilkenny.

The most striking feature of crops in general is the low level of tillage in Region 7. All crops in West Munster do not contribute more than 9·3 per cent to regional output, which is very much below the national average of 22·3 per cent, or even the next lowest region—Meath/Westmeath—at 15·8 per cent. In marked contrast, they account for 36·1 per cent of output in Region 5 (South Leinster), and 24·7 in Region 6 (East Munster). A closer examination of the figures in the Table above offers an explanation for the apparently high levels of tillage in the North and West, particularly in the congested districts (Region 1), i.e., turf and timber are included as crops. Output from this source looms large in the crop totals of Region 1 (Congested Districts) and 3 (Connacht), and is also considerable in Regions 2 (Ulster) and 7 (West Munster). In Regions 5 and 6 (South Leinster and East Munster) output of the cash crops—wheat, barley and sugar beet—contribute over 70 per cent of the crop total, and over 50 per cent in Region 4

TABLE 5: *Percentage Distribution of Crop Output by Main Groups/ Within Regions, (1960) and their Share of Total Output*

Regions	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Total*
"Cash" Crops*	4·2	6·5	25·5	51·3	71·2	73·4	25·5	53·4
Oats and Potatoes	28·1	50·3	23·5	19·6	9·9	9·2	24·8	19·6
Turf and Timber	58·6	24·0	41·2	10·1	2·7	4·0	24·1	13·0
Other Crops	9·1	19·2[1]	9·8	19·0	16·2	13·4	25·6	14·0
Total	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0
Crops as % of Total Output	20·0	18·1	18·3	15·8	36·1	24·7	9·3	22·3
Cash Crops* as % of Total Output	0·8	1·2	4·7	8·1	25·7	18·1	2·4	11·9

*Wheat, Barley, Sugar Beet. [1] grass seed 7·8%

(North Leinster). These crops make up more than half the total output of crops nationally. Of this national output of cash crops 85·5 per cent comes from two regions—South Leinster (47·9 per cent) and East Munster (37·6 per cent). In area 2 (Ulster) oats, potatoes and grass seed tend to be regarded as cash crops—there, their share of the regional total is unusually high at 58·1 per cent, almost three times the national average. In Region 5 and 6 (South Leinster and East Munster) a greater part of "other crops" would be made up of peas and horticultural cash crops, rather than cabbage and turnips for domestic consumption, as in other regions.

Finally, an estimate was made of the cash part of output by regions (see row 9 of Table 2). Using the crude measure of "number of persons having meals on the farm yesterday", the food elements in the farm consumption of £27·1 million were distributed by regions, and added to turf and timber output. On this basis Region 1 (Congested Districts) consumed about 30 per cent of output on the farm, Regions 2 and 3 (North and West) about 20 per cent, and the remaining areas about 10 per cent. It would be instructive to attempt to arrive at these figures by building up progressively from farm consumption figures for each product—milk, potatoes, pigs, turf, etc. The various strands of the analysis of farming pattern which have emerged tend to confirm the degree of specialisation among regions postulated when the areas were being delimited.

Regional Income

The next step is to determine regional income. The procedure followed was that of Table 4 in the Attwood and Geary study[6]—the only modification being the use of more recent figures of tractors and combines to distribute machinery costs. These costs are set out in the Appendix in Table A2. From these, figures for "income arising in agriculture" and "family farm income" were obtained for each region. As it stands Table A2 does not convey a very vivid picture of regional disparity, but can be used to derive a number of economic indicators. In the case of labour, youths under 18 and temporary workers were converted to labour unit equivalents to facilitate inter-regional comparisons. The results obtained are given in Table 6.

Gross output was studied in relation to total area, total area on farms, and area of crops and pasture. Region 1, defined on the basis of its low output relative to total area, naturally had a low output ratio (less than 40 per cent of the national average), but successive exclusions of "non-farm land" and "rough grazing" improved its relative standing. However, as this is also the congested districts where the relationship between land valuations and total numbers engaged in agriculture is particularly unsatisfactory, the output per labour unit is low.

Leaving aside Region 1: in general, the results strengthen the Byrne thesis of the divergence between the poorer North and West and the more prosperous South and East. The argument on the relative positions of Munster and Leinster

6. Attwood and Geary, Ref. 5.

TABLE 6: *Some Derived Statistics on Output and Income by Region (1960)*

Region	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Total*
Gross Output					£			
per acre Total Land	4·3	10·4	10·5	13·1	14·0	15·2	12·6	11·3
per acre land on farms	7·0	12·0	12·2	13·8	16·3	16·7	13·9	13·5
per Agricultural Acre (1)	16·0	14·7	14·6	14·9	19·3	20·4	16·9	17·2
per Male Engaged	287·0	366·0	378·0	579·0	643·0	686·0	539·0	504·0
per Labour Unit	302·0	387·0	400·0	623·0	700·0	731·0	571·0	537·0
Income Arising								
per Agricultural Acre	12·4	9·5	10·6	9·9	11·8	13·3	12·0	11·5
per £1 Valuation	23·3	13·6	17·6	11·3	13·9	17·2	19·5	16·1
per Male Engaged	222·0	236·0	275·0	387·0	393·0	447·0	382·0	338·0
per Labour Unit	234·0	250·0	291·0	416·0	427·0	476·0	405·0	360·0
Family Farm Income								
per Agricultural Acre	11·3	8·1	9·6	7·8	8·8	11·1	10·4	9·7
per Family Labour Unit	229·0	244·0	289·0	473·0	505·0	548·0	431·0	377·0
Management and Investment Income								
per Agricultural Acre	−1·4	−0·5	1·0	4·0	4·2	5·8	4·2	3·0
per £1 Valuation	−2·7	−0·7	1·7	4·0	5·0	7·5	6·8	4·2
per £1 Expenses	−0·4	−0·29	0·26	0·72	0·56	0·82	0·85	0·53
Net Cash Family Farm Income								
per Family Labour Unit	131·0	163·0	197·0	369·0	393·0	453·0	341·0	282·0

1. Per acre of crops and pasture.

is in this instance slightly refined. East Munster (6), engaged in creamery milk production and tillage, has the highest gross output of any region, whether defined in terms of "crops and pasture" or "labour units". Its performance is better than (5) South Leinster (including Louth), which has a large tillage programme, but lacks creamery milk production. The output from creamery milk production of West Munster (7) is clearly superior to below average output from drystock farming in North Leinster (4) when calculated in terms of agricultural area, but inferior in terms of labour units. Success of retaining numbers in farming is, however, more dependent on the latter criterion, though they are interrelated. This is an interesting illustration of the value of a good farming structure which makes for viable farming, in spite of extensive use of land resources. In Region 2 and 3 (Ulster and Connacht) soil and climatic difficulties result in low output from land which is not corrected by a suitable structural pattern. The result is low output also per labour unit.

Similar observations apply to "income arising from agriculture" and "family farm income". In 1960 a farm labourer over 18 years of age was guaranteed an annual wage of £257·7 in Area C (i.e. most of the country). In Regions 1 and 2 income per family labour unit was below this guaranteed[7] minimum and in Area

7. Under the provisions of the current wage agreement negotiated by the Agricultural Wages Board.

3 only slightly above it. In Area 6 (East Munster) in contrast it was more than double. The consequences are reflected in the "Management and Investment Income" row. The return was negative in Regions 1 and 2, but £5·8 per acre of agricultural land in East Munster (6). In his study of a Western pilot area, Scully[8] indicated that investment in farming only occurred if the farmer had confidence in farming, and if his income was sufficient to leave a surplus over his most pressing needs for food and clothing. Lack of confidence and low output would inhibit any thoughts of borrowing, while failure to assume family responsibilities would remove any incentive to improve. The last line of the table shows that the commercial activities of Regions 1 and 2, measured by cash family income, are low with much output going on the farm consumption. This, plus the low returns to management and investment in these regions, must indicate that investment is likely to be low over large parts of the area.[9] The more substantial returns in Munster and Leinster must lead to a more rapid tempo of expansion in these provinces and a great rift between the two geographic poles of the agricultural sector unless the intensive work in the pilot areas and the county development teams can spearhead a change in the North and West.

Can the low levels of management and investment income be explained? Profit is the margin between revenue and expenditure. In traditional farm-management diagnoses the explanation for low level of profit may be found where the level of output is so low that the profit potential is limited, even if the output/cost ratio is more than satisfactory. Alternatively, low profits can occur, associated with high output, if costs are too high relative to output. Where low output is the explanation, the reason may be either (or both) low resource productivity—poor milk yields per cow, or per acre, poor barley yields per acre; or if this is satisfactory, in poor marketing—poor salesmanship, disorganised local demand or selling at the wrong time, e.g. during the harvest glut. Low productivity may not be a reflection of bad husbandry but merely obdurate physical resources. It can also arise from the failure to choose a high yielding combination of enterprises, but this also need not indicate any lack of managerial ability if the nature of the terrain and the vagaries of the local micro climate rule out these alternatives. Translated into regional terms, the prosperity of the last 3 regions may be due to their choice of either dairying (7) or tillage (5) or both (6); and other regions may suffer from placing greater emphasis on low yielding drystock—cattle and sheep. It will be noted that the allocation method in many cases tend to blur regional differences in productivity and prices and furnish, therefore, answers only in terms of enterprise combinations.

There is, however, a further factor to consider—scale of operations. Where the size of enterprise is small it may be extremely difficult to avoid under-employment of resources—principally of labour but also of machinery. One would expect in

8. Scully, Ref. 9.

9. In the Agricultural Wages Board memorandum of May 1965, workers over 20 in Area C were guaranteed a minimum of £403 per annum, compared with £273 in March 1960. Have family farms kept pace with this growth?

these circumstances that labour intensive production would get a high priority—the "unholy trinity" of Barber and Dexter,[10]: milk, pigs and poultry. In many countries this has been the "solution" leading to world gluts of these products.

The first question then is—are small farms characterised by a greater emphasis on these products? If not, can the regional differences in profitability be explained in terms of structure? If small farms generally are not viable, as presently operated, can it be that the negative returns to management and investment in Region 1 merely reflect the predominance of small holdings in the congested districts and conceal the viability of larger farms?

TABLE 7: *Regional Distribution of Farmers and Holdings by Specified Sizes, Average Area of Holdings distinguishing total area and area of Agricultural Land (holdings under 15 acres are excluded)*

	% *Farmers in size group*	% *Holdings in size group*	*Average Size of Holding* — *Total Area*	*Crops and Pasture*	*average % of holding in Crops and Pasture*
Region 1					
15–50	67·9	69·30	29·2	18·8	64·46
50–100	20·5	19·71	69·6	34·3	49·25
100+	11·6	11·00	255·3	55·7	21·83
Region 2					
15–50	75·6	77·09	29·1	25·4	87·14
50–100	18·9	17·67	68·2	56·2	82·45
100+	5·5	5·26	179·1	114·9	64·16
Region 3					
15–50	77·57	78·60	30·4	25·9	83·44
50–100	17·75	16·81	67·9	56·1	82·63
100+	4·69	4·59	173·0	135·2	78·20
Region 4					
15–50	57·08	59·62	30·9	29·3	94·98
50–100	23·60	21·94	70·6	65·8	93·35
100+	19·32	18·44	214·5	195·3	91·04
Region 5					
15–50	43·09	47·56	31·7	28·4	89·53
50–100	31·10	28·81	71·9	62·7	87·27
100+	25·81	23·63	194·2	157·8	81·28
Region 6					
15–50	39·01	41·68	33·2	29·6	89·26
50–100	36·25	34·58	71·8	62·4	86·88
100+	24·74	23·74	172·4	141·3	81·93
Region 7					
15–50	49·70	53·37	32·8	28·1	85·62
50–100	35·01	34·58	70·8	57·3	80·88
100+	15·29	12·05	214·8	148·2	68·99

10. Dexter, K. and Barber, D. *Farming for Profits* London 1961.

Farm Size

The general picture of the distribution of holdings by size is shown in Table 7. From it, it is seen that holdings in Region 2 and 3 (Ulster and Connacht) are generally small. In Region 1 (the Congested Districts) the larger sizes are more apparent than real. If less than half the area of a 50–100 acre farm consists of agricultural land, effectively it belongs to the "under 50 acres" group. Region 6 (East Munster), which was found to have the most prosperous farming also had the smallest proportion of small holdings and the greatest percentage of big ones. Region 5 (South Leinster), the next most prosperous region, was second best in terms in structure. In general there was a close correlation between structure, output and prosperity. However, is a satisfactory structure the result of high output and prosperity, or its cause?

More simply, are there economies of scale which would enable an area of predominantly large farms to be generally prosperous on this account, or is it that the prosperity of certain output combinations enables progressive farmers to extend the size of their farms?

TABLE 8: *Distribution of Land, Output, Income and Labour Force by Principal Sizes of Holding (1960)*

10–100 *Size*	*Total Area*	*Agricultural land*	*Gross Output*	*Family Farm Income*	*Management and Investment Income*	*Males Engaged*
	%	%	%	%	%	%
15–50	22·4	31·2	32·3	36·7	11·9	42·1
50–100	22·4	27·6	27·0	27·0	33·2	24·4
100+	33·4	36·0	32·3	26·7	54·0	21·8

N.B. Due to the omission of holdings of less than 15 acres in extent, and of land not on farms, the columns do not total 100 per cent.

If columns 2 and 4 are compared it will be seen that the ratio of gross output to total area falls with increasing size holdings. This may reflect the poorer quality of large holdings in general, and, partly, the greater incentive to the small holder to maximise output per acre to achieve a satisfactory level of income. If, instead of column 2 the comparison is made with area of crops and pasture (column 3), the largest holdings contributed considerably more than their share of gross output. The disparity for the other sizes was less marked, with the smaller having a higher ratio than the medium. This tends to confirm the views expressed when studying the relationships with total area. The large farms appear in a favourable light now that the large amount of rough grazing and other land they contain has been removed from the calculation. The smallest are compelled by their restricted size to be intensive producers.

If management levels of stock and crops are broadly the same, we would expect the income arising from agriculture to be in proportion to output. Family Farm Income (column 5) is not proportionate to gross output. It is much higher per unit of output on small farms than on larger. This reflects the fact that since small holdings are less likely to employ outside help, their net return per unit of output will be higher after wages have been paid and, therefore, enhances their relative position. If however, family labour is charged the current rates for farm labourers and deducted from family farm income, the balance is "management and investment income", i.e. column 6. While small holdings may not employ much hired labour, they do employ a disproportionate amount of the total males engaged

TABLE 9: *Main Elements in Regional Gross Output on Principal Size Groups (1960)*

Region	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Average*
15–50 acres	%	%	%	%	%	%	%	%
Cattle	37·1	31·0	32·0	40·5	26·5	22·8	26·4	29·7
Milk	23·1	20·5	13·9	23·0	15·6	28·5	40·1	23·1
Sheep	7·8	3·1	15·0	5·5	4·8	2·3	1·3	6.1
Pigs	4·7	14·1	6·4	7·3	10·2	14·5	14·4	10·7
Poultry	10·7	12·4	13·0	8·4	6·8	6·5	6·9	9·5
Crops	15·8	17·3	19·0	13·7	33·8	23·5	9·1	19·3
of which								
Cash Crops*	(0·7)	(0·6)	(4·0)	(5·2)	(23·3)	(17·3)	(1·5)	
50–100 acres								
Cattle	40·3	31·6	34·6	43·5	26·4	25·4	28·2	29·4
Milk	21·5	19·2	11·7	19·1	14·6	27·4	39·4	24·4
Sheep	11·5	5·6	22·5	8·9	7·1	3·4	1·6	6·5
Pigs	5·6	15·1	6·2	6·9	9·7	13·5	15·4	11·8
Poultry	7·8	9·8	9·9	5·9	5·1	5·1	5·6	6·2
Crops	12·5	17·2	14·3	13·8	35·3	23·3	7·8	19·9
of which								
Cash Crops*	(0·9)	(1·4)	(6·1)	(7·5)	(27·2)	(18·0)	(2·4)	
100+ acres								
Cattle	36·6	31·0	37·1	41·1	23·4	26·9	31·0	28·7
Milk	17·7	16·8	9·7	15·1	12·8	22·1	33·7	19·0
Sheep	24·6	10·7	25·8	11·1	8·7	5·4	3·1	8·5
Pigs	3·8	11·0	4·6	4·3	7·8	10·7	13·8	9·1
Poultry	5·5	7·4	6·1	2·6	3·1	3·3	4·0	3·6
Crops	11·5	20·9	14·2	16·3	38·9	27·4	8·8	26·1
of which								
Cash Crops*	(2·0)	(4·1)	(7·6)	(11·0)	(29·1)	(21·3)	(3·7)	

*Taken to be wheat, barley and sugar beet though in some areas other crops, e.g. oats, potatoe and grass seed in Region 2, are grown for sale.

(column 7), so that the deductions from family farm income are considerable. The result is to reverse the ranking obtained for the latter and to widen the range enormously. Not only is management and investment income a measure of competitivity: it is also the source of funds for further investment and rationalisation. Relative to their area of agricultural land, the small holdings have less than 40 per cent of their share of this income, while the large holdings have 50 per cent more than their share. Large holdings therefore have a strong position arising from economies of scale in labour utilisation—a position of strength which will grow even stronger.

But Table 7 showed that size was confounded with region. The above conclusion may be merely an alternative formulation of the thesis that farming in the South East (Regions 5 and 6) has comparative advantages over all other regions. The only satisfactory method is to study the economic performance of farm size in each region individually. This is done in Appendices A.3 and A.4, which give a breakdown of output and income for the twenty-one regional size groups.

To facilitate the commentary on Table A.3 an analysis of output composition was undertaken and tabulated in Table 9 above. The striking feature of this table is the universal downward trend in the contribution from milk and poultry in all regions as size increases, and the opposite movement in sheep and cash crops. In five regions the relative importance of pigs declined with farm size, and in the other two regions (1 and 2) the tendency was downwards, though the share of output on the medium sized farms was greater than on the small holdings.

It appears less easy to generalise about cattle. Movements differed between regions—consistently down in Region 5 (South Leinster), consistently up in Regions 3, 6 and 7 (Connacht and Munster). The remaining three regions had no steady direction of movement, 1 (Congested Districts) was tending down, 4 (Meath/Westmeath) tending up, and in region 2 (Ulster) the proportion on small and large farms was the same and marginally less than medium sized holdings.

In spite of these seeming contradictions there is a clear cut pattern in cattle. Table 10 illustrates this and demonstrates an interesting feature of cattle rearing—the interdependence between size groups within a region on cattle production.

In Region 1, for example, small farms have considerable sales of calves and early stores. Revenue from these categories is only half as important to medium farms, while the large farms buy in some early stores. On the other hand, fat cattle are twice as important on medium farms compared with small, and three times as important on the large.

Although region 4 (Meath-Westmeath) contrasts greatly in farming pattern to the congested districts of region 1, a similar pattern is observable, i.e., older cattle tend to loom larger in the output of the larger holdings. Unlike region 1, all farms in region 4 buy in calves. On the small farms these are the only cattle purchased. Medium farms buy in early stores in large numbers; in value up to one sixth of total cattle output (the only region where this occurs). Purchases of early stores by large farms are twice as significant—over 35 per cent of total output. Sales of late stores predominate the output of small farms and are only

TABLE 10: **A**—% *Distribution of Cattle Output by Main Size Categories in the Principal Size Groups, and* **B**—*the Contribution of each Region to the Total Output of all Holdings in the Size Group*

A *Region*	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Average*
15–50 acres								
Under 1 year	1·84	5·17	−5·99	−7·13	−1·69	14·11	15·62	2·82
1–2 years	21·19	28·11	26·69	1·24	25·57	23·08	29·79	23·98
2–3 years	51·75	49·82	60·04	74·51	49·37	43·14	38·42	52·11
3+ years	16·76	8·58	11·11	19·57	13·19	8·79	8·04	11·56
Milch Cows	8·46	8·32	8·15	11·81	13·57	10·87	8·13	9·53
Total	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0
50–100 acres								
Under 1 year	0·64	−13·82	−7·70	−7·26	−1·99	6·37	10·68	0·71
1–2 years	9·55	11·17	0·87	−16·36	7·03	19·92	18·78	10·67
2–3 years	52·06	69·10	71·72	72·30	59·24	50·67	47·69	57·65
3+ years	30·04	25·51	28·51	41·95	22·31	13·39	15·19	21·71
Milch Cows	7·71	8·04	6·60	9·36	13·41	9·64	7·66	9·27
Total	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0
100+ acres								
Under 1 year	0·09	−15·47	−7·94	−5·12	−2·58	−3·40	2·53	−3·23
1–2 years	−1·87	−13·71	−25·03	−35·05	−23·98	−0·13	−5·34	−14·32
2–3 years	42·84	69·71	42·35	21·41	53·96	58·59	54·66	50·29
3+ years	51·92	52·24	85·34	110·81	59·03	37·58	42·16	58·53
Milch Cows	7·01	7·23	5·27	7·95	13·58	7·35	6·00	8·74
Total	100·0	100·0	100·0	100·0	100·0	100·0	100·0	100·0
B	*Regional Contribution to Total Cattle Output of Size Group*							
15–50 acres	11·23	18·55	23·25	8·63	12·37	12·33	13·64	100·0
50–100	6·62	9·54	11·47	8·19	18·18	25·37	20·63	100·0
100+ acres	4·32	4·54	5·61	14·61	26·21	30·25	14·44	100·0
Total	7·48	11·04	13·67	10·57	18·88	22·39	15·98	100·0

slightly less important to medium farms. Their importance to large farms, however, is only 40 per cent of their significance to the small and medium sized holdings. On the other hand, fat cattle are so important in the output of large farms that revenue derived from them is equal to 110 per cent of cattle output. This is almost three times their significance for medium farms, and almost six times that for small farms.

Similar observations could be made about other regions. Space, unfortunately, does not permit the development of all the implications of the above table. In summary, there is not only a tendency for calves to move from the creamery areas, where they are dropped through the rearing areas towards Region 4 (Meath–Westmeath) and areas adjacent to Dublin, but also a tendency for them to move on to bigger farms within a region as they mature. This applies even to a dairying area like East Munster (6). For example, although small farms sold considerable numbers of calves and early stores, Table 10 shows that in Region 6 large farms were net purchasers of both these categories.

TABLE 11: *Some Derived Statistics of Output and Income for the Twenty-One Regional Size Groups (1960)*

	Gross Output per acre of agricultural land			*Income Arising* £		
	Size of holdings			*Size of holdings*		
Region	*15–50*	*50–100*	*100+*	*15–50*	*50–100*	*100+*
1	15·3	13·2	12·2	11·8	9·8	9·1
2	15·3	12·6	11·7	10·4	7·5	6·5
3	15·9	12·9	10·5	11·8	9·1	6·9
4	16·7	14·7	13·1	11·6	9·8	8·5
5	20·6	18·8	17·4	13·0	11·2	10·4
6	23·2	20·3	17·2	16·2	13·3	10·7
7	19·9	17·6	14·6	14·7	12·5	9·8
	Family Farm Income per acre of agricultural land			*Management and Investment Income*		
1	10·8	8·9	7·9	−2·4	0·8	2·2
2	9·4	6·2	3·9	−0·8	0·6	0·9
3	11·1	8·2	5·2	0·4	3·3	2·6
4	10·1	8·2	5·8	1·8	4·7	4·3
5	10·7	8·8	7·2	2·0	4·9	4·8
6	14·5	11·5	8·3	5·2	9·2	5·7
7	13·4	10·8	7·8	3·3	8·3	4·6
	Income Arising per Labour Unit			*Family Farm Income per Family Labour Unit*		
1	216	273	345	211	270	356
2	244	279	313	238	276	336
3	271	341	433	268	344	516
4	313	419	556	315	459	978
5	321	397	518	326	439	816
6	390	481	576	405	540	820
7	337	434	507	342	471	639

In conclusion, small holdings tend to concentrate more on the labour intensive products—milk, pigs, poultry and calves—and leave the extensive cattle, sheep and cash crops, such as wheat and barley, to larger farms. It is less easy to explain the greater importance of labour intensive sugar beet to large farmers, unless it be the attraction of the tops for drystock feeding.

Is the choice of intensive products by small holders sufficient to redress the effects of economies of scale or can the presence of low or negative returns to management and investment in certain regions be explained in terms of predominant small farm economy which has failed to achieve this balance?

Table 11 gives some economic indicators measuring the performance of different farm sizes in the seven regions. This should be studied in conjunction with Table 7 which describes the regional structures. The first three sections of the table repeat the pattern shown in Table 8—a fall in the return to crops and pasture land, whether measured in terms of gross output, income arising, or family farm income.

The position with regard to management and investment income is more complex. Measured on the basis of acres of crops and pasture, it is seen to increase with increasing size of holdings in Regions 1 and 2. In all other regions small holdings were lowest, followed by large holdings with medium holdings reporting the highest incomes per acre. In Connacht and Leinster (3, 4 and 5) the small holdings were low relative to the large. In Munster the difference was less marked. On the other hand, the difference between large and the medium was more accentuated in Munster than in either Connacht or Leinster. In Regions 1 and 2 income per acre was low on all sizes of holdings. The unfavourable relationships between labour and agricultural land in Regions 1 and 2 results in negative returns to management and investment for the smaller farms, partly due in Region 1 (Congested Districts) to the excessive amount of non agricultural land on the holdings but mainly due to excessive labour supplies at existing levels of output. In terms of crops and pasture the area on medium and large farms in Region 1 approximated to those on small and medium farms in other regions, i.e., 34·3 and 55·7 acres. Judged on this basis, the performance of farms in the congested districts of Region 1 was not quite so unsatisfactory. In contrast, management and investment income in Region 2 (Ulster) did not improve adequately with increasing size.

In the discussion so far the criterion has been the area of agricultural land. The real key to whether farmers will be prepared to continue farming is the income return per family labour unit. In this respect, small farms in Region 6 (East Munster) had better incomes (£405) than large farms in either Region 1 (£356) or 2 (£336). Large farms in Region 4 (Meath-Westmeath) had almost three times the income of similar farms in Region 2 (Ulster), and not quite three times the income of large farms in the congested districts (1). These farms in Region 4 had the highest income per family labour unit of any farms in the country—partly because they had by far the largest area of crops and pasture (cf. Table 7), (i.e., 195 acres, compared with 56 in Region 1, and 115 in Region 2) and partly because so

much (about 40 per cent) of the labour force was hired, and the surplus earnings over the agricultural wage accrued to the family labour units.

Comparison with the National Farm Survey

At the outset of this paper, data availability and the work on county income suggested that these figures be obtained by the use of the Byrne allocation method. Let us now make a brief appraisal of the 1957 National Farm Survey to discover the kind of results that would have been forthcoming from the Linehan approach. In that year the gross value of output (excluding value of changes in livestock numbers) was 99·4 per cent of the 1960 figure. Including inventory changes it was 98·5 per cent, since the trends were in opposite directions. The totals for cattle and milk were broadly the same; and while there were somewhat fewer sheep and pigs, there was more wheat and potatoes. The differences were not so great as to diminish the value of a rough comparison of the two years. The published figures for some of the main categories of the National Farm Survey were adapted to yield the following results of farms in the regions.

The North and West Region covers most of Regions 1 and 2. No figures are available for farms over 100 acres, or for subsistence farms over 50 acres. The latter was broadly equated with Region 1. In the East and Midland region there were three regions—3, 4 and 5—the first two represented by the "cattle mixed" group and the latter by the "crops mixed". In the southern region "dairying with cash crops" was taken to represent Region 6, while "dairying without cash crops" corresponded broadly with Region 7. Unfortunately it was not possible to subdivide the "cattle mixed" group to get a picture of the relative positions of Regions 3 and 4. However, since most of the large farms were east of the Shannon, the big farms can be taken as more typical of Region 4 and the small ones of the Connacht region. In addition, there were no figures for very large farms (over 200 acres) engaged in "dairying without cash crops".

It will be clear from the discussion that since the two studies differ considerably in their basis, and in the classification of farms, only a very approximate comparison can be attempted. The first similarity is the manner in which gross output per adjusted acre shows the same universal decline with increasing farm size. The ranking of the regions is maintained with "Region 6" (creamery and tillage) ahead of "Region 5" (tillage), followed by "Region 7" (dairying), and winding up with the subsistence farms (Region 1?). The relative orders of magnitude appear the same, except for the "crop mixed", which has the highest return to labour on big farms. The National Farm Survey, however, shows higher levels of gross output, and much higher returns to male family labour units (the figures were adjusted to exclude the female contribution). If we compare the fifteen farm types listed in Table 12 with their "equivalents" in Table 11 on the basis of family farm income per labour unit, we find small subsistence farms had the same income. Otherwise the allocation method was lower—by a sixth on medium and large cattle farms (based on Region 4), by a fifth on dairying farms without cash crops and large dairying farms with cash crops, and by a quarter on small farms in the

TABLE 12: *Derived Statistics of Gross Output per Adjusted acre and Family Farm Income for some of the Principal Types of Farming Based on the National Farm Survey 1957*

Size (acres)	*Number of Farms*	*Total Area Farmed* acres	*Total Adjusted area* acres	*Gross Output per Adjusted Acre* £	*Family Farm Income per Male Family Labour Unit* £
		North and West Region			
Subsistence Farms					
15–50	94	27·0	22·0	11·6	207
All Farms					
15–50	317	32·8	29·7	17·1	310
50–100	72	73·3	57·5	15·5	420
		East and Midland Region			
Cattle Mixed					
15–50	136	38·0	32·8	21·4	418
50–100	65	77·7	66·9	17·0	542
100+	64	236·2	197·1	15·7	1,128
Crops Mixed					
15–50	76	41·7	38·6	29·3	475
50–100	54	77·2	70·6	26·1	666
100+	61	188·0	159·6	24·3	1,188
		South Region			
Dairying with Cash Crops					
15–50	99	39·9	38·2	31·5	561
50–100	106	73·6	66·8	28·7	744
100+	116	174·6	149·3	22·1	1,008
Dairying without Cash Crops					
15–50	87	35·3	32·4	28·5	429
50–100	94	73·1	59·1	22·0	588
100+	47	134·0	99·0	21·1	819

North and West, and in Region 4 (cattle). It was lower by slightly more than a quarter on small and medium dairy farms with cash crops, by 30 per cent on small and large tillage farms, and by a third on medium farms both in the North and West, and on tillage areas as well as on small cattle farms (Region 3).

Apart from the fact that these farms are only very approximately equivalent, there are several other reasons for these discrepancies. In the National Farm Survey the definition of area was "total area farmed" (which allowed for conacre), and "total adjusted acreage", which reduced "rough grazing" and "other land" on

an acreage equivalent basis. The results, compared with those in Table 7, show a close correspondence for the big farms; but the C.S.O. small and medium farms tend to be bigger than the average area of crops and pasture per holding calculated in Table 7.

Two further explanations can be advanced for the higher figures derived from the National Farm Survey. The first relates to the extent of bias in the survey, which has been dealt with exhaustively in the introduction to the Final Report.[11] Some sentences are very relevant: "It appears that the average results of the sample are somewhat above the true national averages because, acre for acre of total land, the sample farms have slightly higher densities of livestock and ploughed land. . . .

As farms which were let entirely (or almost entirely) are not included in their own right as survey farms, the average area farmed (unadjusted) tends to be higher in most groups than the average owned. . . . From the results it would appear, that acre for acre, output, expenses and farm income for the matched Sample Survey farms for 1955 (and, by implication for the average of the three years) exceed the corresponding national averages (obtained using Survey concepts and definitions) for all holdings by about one-sixth. In this context, however, it is emphasised that all land, including that on so-called "derelict holdings", has been included in arriving at the national averages. If we restrict ourselves to land on holdings which are being farmed, then the resultant overall averages would be much closer to the Survey averages. In the case of the Survey results based on all farms included in the Survey in 1955 the bias appears to be somewhat more than one-sixth for expenses and somewhat less than one-sixth for labour and family income. It should be borne in mind that the estimates of the bias in the sample results relate to the sample as a whole and not to each of the individual sub-classes."[12] The bias, therefore would be greater when applied to regions and patterns of farming.

The second possible explanation relates to the assumptions about labour in the allocation method. Temporary workers were assumed to work about 5/8ths of the time of permanent workers and all family labour was assumed permanent. This might exaggerate the amount of labour available and, therefore, reduce the return per labour unit resulting from the allocation method. Perusal of the National Farm Survey did not confirm this. Another factor might be the rise in wages in the three years.

In general, the comparison would support the reasonableness of the estimates of family farm income and management and investment income arrived at by the allocation method. It is possible that the true values lie somewhere between these and those of the National Farm Survey if allowances are made for derelict land, actual area farmed and the upper bias in the Survey.

It is not proposed in this paper to delve into the implications of these income figures for farm consolidation, labour migration, etc. It is hoped to treat some of

11. See Ref. 4, *Introduction.*

12. *Ibid.*, p. xviii.

these in a later study. However, space would permit a brief presentation of the relationship between the male agricultural labour force, as returned in the Agricultural Enumeration 1960 and income per labour unit set out in Table 13. This enumeration distinguishes between members of the family and hired workers, the latter being further subdivided into permanent and temporary. Another breakdown divides the labour force into those over 18 years of age and those between 14 and 18. Family labour is not classified into "permanent" and "temporary".

Table 13 shows 337,757 males engaged in farming in 1960 on holdings over 15 acres in extent with half of them on holdings of 50 acres or less. These latter holdings had reported declines in numbers of 9 to 13 per cent in various regions between 1949 and 1960; nevertheless the density of males engaged per 100 acres of crops and pasture continued universally high. The figure of 5·7 in Region 1 confirms that this is, indeed, the congested districts. Income per labour unit, however defined, was below the agricultural wage so that management and investment was negative. The position was only slightly better on small farms in the remainder of the North and (West Region) 2. Very little more than the agricultural wage was obtained on small farms in East Connacht or on medium farms in Regions 1 and 2. Summing over these five farm types we get a total of 110,215 males engaged, or a third of all those on holdings over 15 acres. There can be some argument as to whether all these people are, in fact, engaged in farming. For example, 10,589 were returned as hired workers but only one third of these were permanent workers over 18 years of age. Here again, "permanent" may be only a relative term. The "permanance" of the 100,000 odd family worker is not stated. Even allowing for all possible corrections it is obvious there were large numbers of farmers in Connacht and Ulster who failed to earn the low levels of the agricultural wage for their labours, i.e. £257 7s. per annum.

On the other hand small farms in East Munster had incomes that compared very favourably with remuneration in alternative employment outside agriculture as reported by Attwood and Geary, i.e. £390 or £405 vs. £391.,[13] This applied with more force to medium farms and large farms in Regions 4–7 as well as large farms in East Connacht (3). In all 156,594 males were returned as engaged in farm work on these holdings in the June enumeration, or 46 per cent of the total over 15 acres. Of these just over 59,000 were hired workers but only 60 per cent were permanent employees over 18 years of age, i.e. 36,200. In view of the relative unattractiveness of the agricultural wage even for permanent employees it is clear that many of these could be easily lured into nonagricultural employment by offers of higher remuneration. These are also the regions where the manufacturing and service sectors are most dynamic so that farmers will be hard pressed to retain their workers. There is considerable evidence that this tug-o-war is already in full operation in many counties.

13. The basis of comparison was with employee remuneration per head in special groups Table 12, column 9, Ref. 5.

TABLE 13: *Some Aspects of Regional Employment in Agriculture Related to Income and Farm Size*

Region	Males engaged	% Hired		Males per 100 acres Crops and Pasture	Income Arising per Labour unit	Family income per family labour unit
		Total	Permanent over 18			
			15–50 acres			
	Number	%	%	*Number*	£	£
1	20,947	7·6	2·1	5·7	216	211
2	32,461	10·0	3·0	4·5	244	238
3	39,023	7·2	2·0	4·6	271	268
4	9,324	17·4	5·5	3·9	313	315
5	18,309	22·9	9·0	4·4	321	326
6	18,998	17·2	7·4	4·4	390	405
7	22,096	12·5	4·8	4·6	337	342
All areas	161,158	12·2	4·3	4·6		
			50–100 acres			
1	7,194	10·6	3·8	3·8	273	270
2	10,590	20·1	8·0	2·9	279	276
3	11,249	13·5	4·6	2·9	341	344
4	4,959	28·6	11·7	2·5	419	459
5	17,354	33·5	16·5	3·1	397	439
6	22,422	26·9	14·0	3·0	481	540
7	19,457	23·1	12·1	3·1	434	471
All areas	93,225	23·8	11·3	3·0		
			100 acres and over			
1	4,839	18·6	9·7	2·8	345	356
2	5,131	37·9	28·7	2·3	313	336
3	4,508	40·6	23·0	1·7	433	516
4	8,039	62·9	44·6	1·7	556	978
5	25,493	59·2	40·4	2·2	518	816
6	23,525	48·1	33·3	2·0	576	820
7	11,839	40·0	26·2	2·1	507	639
All areas	83,374	49·6	33·3	2·1		

Source: Unpublished data from the Agricultural Enumeration 1960, and Table 9.

The position of the 97,500 family workers on these holdings is much stronger. When the wages of hired workers has been deducted the balance is, by and large, available for their remuneration, though, properly speaking, it should also be regarded as a return on investment. These farmers would seem to form the nucleus of the commercially viable agriculture in the country. A subset of these holdings—those over 100 acres in Leinster and Munster can be seen to be in a really strong position which bodes particularly well for the economic well being of the 32,700 family members engaged in farming these lands.

In general, then, of the 338,000 engaged 83,200 were hired workers who were frequently poorly paid even if fully employed. Just over a quarter of a million were farmers and their families. Of these, 40 per cent were earning incomes at least comparable to wages in other sectors of the economy, a slightly larger proportion found it hard to get a return equivalent to an agricultural labourer's wages and the balance came somewhere in between. Put in terms of Table 7 above, all holdings tended to be fully viable,[14] in East Munster (6) somewhat less than half of them in West Munster and Leinster, only about 5 per cent of them in East Connacht and none elsewhere. If those potentially viable are added this would include all holdings in Munster and Leinster, about a quarter of holdings in East Connacht, 10 per cent of those in the Congested Districts and only 5 per cent of those in Region 2 of Connacht and Ulster. Indications are, however, that on the basis of 1965 returns Region 2 would have performed considerably better.[15]

The assessment of averages is not enough. Geary,[16] in a paper to the Statistical and Social Enquiry Society showed the wide range in variability in farming within a county. These figures were confirmed in a most telling fashion by the National Farm Survey "on a per acre basis the upper third (of farms) was about 47 per cent above average (in output,expenses or income) and the lower third about 39 per cent below average".,[17] The fact that a region or size group has a rather low level of performance must not lead to despair since one-third of the farms within the region will probably have a much more viable position—better, in fact, than many farms included in a group with a more impressive mean. The approach must be to appraise the situation to discover if the low average is the product of inherent differences in the quality of land and livestock, inequal access to markets or merely poor management,[18] and to work from there. This was the task of the resource allocation model mentioned at the outset and a separate publication will set out the potential contribution each farm type could make to the fulfilment of national goals.

14. Defining "fully viable" as having a family farm income per family labour unit of over £400 in 1960 and "potentially viable" if it fell between £300 and £400.

15. See Ref. 13.

16. Ref. 12.

17. Ref. 4, p. xviii.

18. If it is due to poor management this management variability distribution would need to be included in the model if good farms in a poor region are not to be excluded from the optimal solution.

APPENDIX NOTE 1

The delineation of the Regions

Previous work offered a variety of possible regions:— viz, Byrne—provinces, Attwood and Geary—counties, National Farm Survey—three aggregations of counties, Attwood—rural districts in the congested districts, Scully and Swanson—six specially drawn regions.[19] Programming requirements dicated that the regions should be not more than seven or eight in number, reasonably homogeneous, and for statistical convenience, be, as far as possible, aggregates of counties. Previous regions did not fulfil these requirements adequately though they provided a point of departure for a new demarcation. An obvious dichotomy was between the congested districts and the rest. Following Attwood[6] this was defined by rural district rather than by county except for Galway R.D. where only the section west of Galway city was deemed congested. Broadly speaking this was Region 1. Next the agricultural data published in the 1960 county incomes[7] was used to define the farming pattern of each county. Four major groups emerged:— A Northern and Southern group of counties in which the main source of income was from intensive farming, milk, pigs and poultry. These were Sligo, Leitrim, Cavan and Monaghan, and Munster excluding Clare. Leinster counties (apart from Meath, Westmeath and Longford) and Donegal derived their major source of income from crops while in the remainder of the country cattle predominated. Since much of Donegal and Clare was already classified as congested a separate study of the balance of these counties indicated that they belonged to the Northern and Southern intensive groups respectively and were so allocated. The Northern group became Region 2. The Southern group, which comprised all Munster outside the congested districts, was too large and heterogeneous. Rural districts were classified on their tillage intensity. Those with below average levels formed a subgroup—Region 7. The other subgroup became Region 6 and, since it resembled the dairying and tillage pattern of Kilkenny, the latter was transferred to it. The remaining eight tillage counties of Leinster became Region 5. The cattle group was divided in two:— The Western midlands of East Galway, South Mayo, Roscommon and North Longford and the Leinster midlands of Meath, Westmeath and South Longford using as criteria level of output, soil type and farming pattern. Sheep farming was one element in the latter criterion. Finally some of the boundaries were extended, e.g. Killala-Ballina and Milford-Letterkenny to cater several District Electoral Divisions sampled in the 1964 Farm Management Survey which could not be regarded as part of the congested districts. This was essential to the allocation study which derived its matrix of technical coefficients from this Survey. The results of this delineation was to vindicate the triregional classification of the National Farm Survey, the boundaries of which coincided with those of the six regions apart from the congested districts except in the Ballinrobe area of Mayo now included with Tuam in the midland area.

The National Farm Survey had a triple classification by region, farming pattern and farm size. The distribution of survey farms by region and type was as follows:

19. See: Byrne, Ref. 3; Attwood & Geary, Ref. 4; Attwood, Ref. 6; Scully & Swanson, Ref. 8.

Distribution of National Farm Survey Farms by Region and Type

	South	*East and Midland*	*North and West*	*All areas*
Mainly dairying	51	8	12	71
Dairying mixed with cash crops	166	40	11	217
" " without cash crops	135	19	64	218
Crops Mixed	33	145	22	200
Cattle Mixed	11	174	95	280
Subsistence	12	41	100	153
Other	5	15	15	35
All types	413	442	319	1,174

The specially delineated regions tend to be associated with these major farming type. Region 7 approximates "mainly dairying" and "dairying without cash crops" in the South. Region 2 corresponds to the same type in the North with perhaps the "cattle mixed" also included. Region 6 comprises "dairying with cash" crops in the South. "Crops mixed" predominate in Region 5. Regions 3 and 4 are mainly areas of mixed farming based on cattle with larger farms in Region 4 while Region 1 is made up of areas of subsistence farming in the South, West and North.

APPENDIX NOTE 2

Some Modifications in the Attwood and Geary method for the Calculation of Regional Incomes.

Sheep

In the study by Attwood and Geary[20] sheep output was assumed to be £6·5 per ewe in the eight congested counties and £7·6 elsewhere. Subsequently the national flock of ewes was classified by breed into (*a*) cheviots, (*b*) blackfaced, (*c*) short woolled downs and (*d*) others. It seemed more satisfactory to use this as a basis for distribution and the values attributed were respectively £6.6—cheviots, £3·5—blackface, and £8·6 for the two last mentioned. This change enhanced the output of Region 3 (Connacht) by £0·8m.—an increase of 26 per cent. In compensation the large blackfaced flocks in Region 1 (Congested Districts) and 7 (West Munster) led to a reduction of £0·5m. and £0·1m. respectively while the concentration of cheviots in Region 5 (South Leinster) led to a fall of £0·2m. in that region.

Change in Livestock Inventories

The gross figure of £1·695 millions was composed of £1·473 millions for cattle, £0·887 for pigs, £-·566m. for sheep and £-·099 for poultry. It seemed preferable to use this rather than distribute the gross figure by livestock units enumerated in June 1960.

20. Attwood and Geary, Ref. 5.

TABLE A.1. *Gross Output of Agriculture 1960, Distinguishing Principal Product Groups by Region*

Group	Regions 1	2	3	4	5	6	7	Total
				£000				
1 Cattle and Calves	4,486·3	6,433·6	7,594·4	5,723·2	10,268·3	11,934·2	8,581·0	55,021·0
2 Milk & Milk Products	2,868·6	4,115·2	3,012·2	2,574·4	5,807·8	11,997·9	11,632·9	42,009·0
3 Eggs and Poultry	1,236·7	2,521·0	2,712·2	831·3	2,216·7	2,534·0	1,934·1	13,986·0
4 Pigs	539·0	2,835·8	1,413·2	849·3	4,326·4	6,213·9	4,593·4	20,771·0
5 Horses	34·9	81·4	99·4	599·3	1,402·2	838·6	455·2	3,511·0
6 Other Livestock	5·1	11·4	12·1	5·0	31·2	27·5	13·7	106·0
7 Sheep	1,323·2	963·9	3,954·2	1,200·3	3,030·0	1,881·7	572·7	12,926·0
8 Total Livestock	10·493·8	16·962·3	18,797·7	11,782·8	27,082·6	35,427·8	27,783·0	148,330·0
9 Total Crops	2,641·2	3,806·5	4,237·0	2,231·0	15,480·3	11,780·5	2,900·5	43,077·0
10 Cash Crops	112·0	246·6	1,080·5	1,144·6	11,022·5	8,650·2	739·6	22,996·0
11 Value of Inventory Changes	49·9	233·9	76·1	117·0	295·2	503·6	419·3	1,695·0
12 Total Gross Output	13,184·9	21,002·7	23,110·8	14,130·8	42,858·1	47,711·9	31,102·8	193,102·0
13 Including Farm Consumption	3,993·4	3,826·4	4,826·0	1,628·7	4,341·1	4,470·8	4,015·8	27,100·0
				Breakdown of Some Groups				
Cattle								
14 Under 1 year	106·2	−30·4	−472·9	−348·4	−211·7	442·7	850·7	336·3
15 1–2 years	691·7	1,284·0	1,086·2	−1,045·4	−186·8	1,355·4	1,280·9	4,466·1
16 2–3 years	2,171·6	3,526·8	4,536·2	2,790·6	5,520·3	6,275·8	3,987·5	28,818·8
17 3+ years	1,127·9	1,131·6	1,874·0	3,780·8	3,739·5	2,796·5	1,830·5	16,280·7
18 Milch Cows	388·9	521·6	570·9	545·6	1,396·9	1,063·8	631·4	5,119·1
Milk								
19 Liquid (Dublin & Cork)	—	—	9·6	1,399·4	2,083·7	614·1	—	4,106·8
20 Farm Household	786·2	982·8	1,048·3	419·3	1,146·8	1,180·0	988·6	6,552·0
21 Remainder	283·4	401·5	361·1	202·2	842·0	783·0	503·0	3,376·2
22 Used in Industry	1,251·3	2,271·6	—	65·5	316·8	9,205·7	10,079·1	23,190·0
23 Farmers' Butter	527·0	441·9	1,532·9	469·5	1,364·8	207·1	59·8	4,603·0
24 Buttermilk &Whey	20·7	17·4	60·3	18·5	53·7	8·0	2·4	181·0
Sheep								
25 Cheviot	83·7	93·0	67·0	176·7	1,166·8	95·4	26·9	1,709·4
26 Blackfaced	740·9	177·9	82·0	68·8	188·5	157·8	187·6	1,603·5
27 Other	498·7	693·1	3,805·2	954·9	1,674·8	1,628·5	358·2	9,613·4

APPENDIX A.2

Gross Output of Agriculture 1960, Distinguishing Principal Product Groups by Region and Size Groups

A 15–50 Acres

Region	*1*	*2*	*3*	*4*	*5*	*6*	*7*	*Total*
				£000				
Cattle	2,085·5	3,444·2	4,317·8	1,603·1	2,296·3	2,290·4	2,532·5	18,569·8
Milk	1,301·8	2,275·0	1,878·6	908·0	1,354·8	2,853·5	3,848·6	14,420·3
Sheep	437·8	346·8	2,021·5	218·5	418·7	226·2	121·3	3,790·8
Pigs	265·2	1,568·2	856·4	287·9	886·9	1,454·1	1,378·0	6,696·7
Horses	9·0	25·6	29·3	20·4	102·4	73·0	39·1	298·8
Poultry	599·1	1,371·8	1,756·1	332·7	585·7	651·9	662·0	5,959·3
Other Livestock	2·3	6·1	7·0	1·4	6·5	5·9	4·3	33·5
Total Livestock	4,700·7	9,037·7	10,866·7	3,372·0	5,651·3	7,555·0	8,585·8	49,769·2
Total Crops	889·4	1,921·1	2,565·2	542·5	2,927·8	2,357·8	870·8	12,074·6
Value of Inventory	35·3	135·1	52·4	39·0	73·4	112·2	126·6	574·0
Total Gross Output	5,625·4	11,093·9	13,484·3	3,953·5	8,652·5	10,025·0	9,583·2	62,417·8
B 50–100 Acres								
Cattle	1,013·7	1,459·7	1,755·1	1,252·8	2,782·0	3,883·0	3,157·9	15,304·2
Milk	542·0	885·6	591·6	548·4	1,542·7	4,187·9	4,410·0	12,708·2
Sheep	288·9	251·6	1,141·7	257·2	748·1	525·9	174·7	3,393·5
Pigs	140·7	697·6	316·6	199·6	1,016·7	2,069·3	1,717·9	6,158·4
Horses	7·2	16·4	20·9	24·6	102·4	114·0	66·0	351·5
Poultry	196·5	451·5	499·6	170·7	538·6	776·4	662·5	3,255·8
Other Livestock	1·1	2·5	2·8	1·0	7·8	9·0	5·0	29·2
Total Livestock	2,190·1	3,770·3	4,328·3	2,454·3	6,738·3	11,565·5	10,154·0	41,200·8
Total Crops	313·6	797·2	726·8	397·1	3,717·7	3,562·9	869·5	10,384·8
Value of Inventory	13·4	54·5	9·5	26·5	77·1	169·8	158·3	509·1
Total Gross Output	2,517·1	4,622·0	5,064·6	2,877·9	10,533·1	15,298·2	11,181·8	52,094·7
C 100+ Acres								
Cattle	775·6	814·5	1,006·8	2,620·4	4,700·5	5,425·2	2,590·0	17,933·0
Milk	374·1	441·5	264·4	961·4	2,568·1	4,455·5	2,821·2	11,886·2
Sheep	521·4	279·8	699·9	707·2	1,745·1	1,096·4	262·3	5,312·1
Pigs	81·4	289·3	124·4	276·9	1,570·5	2,168·7	1,157·5	5,668·7
Horses	15·6	34·9	47·6	549·9	957·9	629·0	338·2	2,572·2
Poultry	116·4	194·7	166·2	167·7	623·6	673·9	337·7	2,280·2
Other Livestock	0·9	1·4	1·5	2·2	14·0	11·2	3·7	34·9
Total Livestock	1,885·4	2,056·1	2,310·8	5,285·7	12,178·8	14,459·9	7,510·6	45,687·3
Total Crops	243·1	548·6	386·1	1,038·0	7,814·7	5,539·5	740·1	16,310·1
Value of Inventory	−10·4	20·2	16·8	43·9	104·9	194·5	113·8	483·7
Total Gross Output	2,118·1	2,624·9	2,713·7	6,367·6	20,098·4	20,193·9	8,364·5	62,481·1

APPENDIX A.3

Derivation of Agricultural Income 1960 by Region and Size Group

15–50 *Acres*

Region	1	2	3	4	5	6	7	*Total*
			£000					
Total Gross Output	5,625·4	11,093·9	13,484·3	3,953·5	8,652·5	10,025·0	9,583·2	62,417·8
Animal Feed	467·3	1,336·8	1,157·9	420·1	871·6	1,095·3	1,106·9	6,455·9
Fertilisers and Lime	164·6	367·8	520·8	131·7	428·8	401·2	298·4	2,313·3
Machinery	144·4	638·9	356·9	210·9	842·1	478·9	213·4	2,885·5
Rates	174·3	457·6	503·0	194·2	359·4	338·0	306·6	2,333·1
Seeds	76·6	238·9	243·4	70·6	290·5	221·4	108·0	1,249·4
Miscellaneous	271·1	534·3	648·9	190·7	416·9	482·4	461·4	3,005·7
Total Costs	1,298·3	3,574·3	3,430·9	1,213·2	3,209·3	3,017·2	2,494·7	18,242·9
Income Arising	4,327·1	7,519·6	10,053·4	2,735·3	5,443·2	7,007·8	7,088·5	44,174·9
Rent Element	45·5	119·6	131·5	50·8	94·2	88·7	80·3	610·6
Remuneration	289·0	614·5	521·3	306·0	859·9	663·0	545·5	3,799·2
Family Farm Income	3,992·6	6,785·5	9,400·6	2,378·5	4,489·1	6,256·1	6,462·7	39,765·1
Cost of Family Labour	4,863·6	7,338·3	9,050·5	1,946·4	3,658·5	4,001·6	4,876·7	35,735·6
Management and Investment Income	−871·0	−552·8	+350·1	+432·1	+830·6	2,254·5	1,586·0	4,029·5

50–100 *Acres*

Total Gross Output	2,517·1	4,622·0	5,064·6	2,877·9	10,533·1	15,298·2	11,181·8	52,094·7
Animal Feed	227·7	574·9	442·4	309·8	1,018·6	1,629·0	1,357·4	5,559·8
Fertilisers and Lime	73·5	195·5	219·1	105·4	575·3	741·9	387·9	2,298·6
Machinery	105·6	515·6	249·2	211·9	1,319·1	1,167·2	427·9	3,996·5
Rates	90·3	233·0	226·4	145·3	421·8	545·3	411·6	2,073·7
Seeds	32·8	126·7	98·4	54·3	383·4	403·1	138·1	1,236·8
Miscellaneous	121·3	222·6	243·7	138·9	507·7	737·3	538·5	2,510·0
Total Costs	651·2	1,868·3	1,479·2	965·6	4,225·9	5,223·8	3,261·4	17,675·4
Income Arising	1,865·9	2,753·7	3,585·4	1,912·3	6,307·2	10,074·4	7,920·4	34,419·3
Rent Element	23·5	60·9	59·2	38·1	110·6	143·1	107·8	543·2
Remuneration	149·0	418·9	290·0	281·7	1,250·7	1,269·9	946·1	4,606·3
Family Farm Income	1,693·4	2,273·9	3,236·2	1,592·5	4,945·9	8,661·4	6,866·5	29,269·8
Cost of Family Labour	1,617·7	2,119·4	2,514·0	894·3	2,986·8	4,148·5	3,764·4	18,045·1
Management and Investment Income	75·7	154·5	722·2	698·2	1,959·1	4,512·9	3,102·1	11,224·7

100+ *Acres*

Total Gross Output	2,118·1	2,624·9	2,713·7	6,367·6	20,098·4	20,193·9	8,364·5	62,481·1
Animal Feed	180·4	272·8	196·4	564·9	1,642·7	1,891·0	976·6	5,724·8
Fertilisers and Lime	51·2	153·6	127·1	257·5	1,143·1	1,146·2	328·3	3,207·0
Machinery	103·1	339·0	225·8	561·8	2,550·7	1,994·0	538·3	6,312·7
Rates	85·7	173·0	197·2	435·1	966·7	965·8	400·7	3,224·2
Seeds	22·1	99·3	54·2	126·5	751·7	610·4	113·7	1,777·9
Miscellaneous	102·2	126·5	130·2	307·1	968·0	971·6	403·0	3,008·6
Total Costs	544·7	1,164·2	930·9	2,252·9	8,022·9	7,579·0	2,760·6	23,255·2
Income Arising	1,573·4	1,460·7	1,782·8	4,114·7	12,075·5	12,614·9	5,603·9	39,225·9
Rent Element	22·3	52·7	51·5	114·0	253·4	253·4	104·9	852·2
Remuneration	189·7	534·3	392·0	1,157·3	3,559·8	2,581·7	1,056·8	9,471·6
Family Farm Income	1,361·4	873·7	1,339·3	2,843·4	8,262·3	9,779·8	4,442·2	28,902·1
Cost of Family Labour	987·4	673·8	665·9	748·6	2,687·0	3,083·8	1,791·0	10,637·5
Management and Investment Income	374·0	199·9	673·4	2,094·8	5,575·3	6,696·0	2,651·2	18,264·6

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