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CENTRE FOR  
EUROPEAN AGRICULTURAL STUDIES

THE DEVELOPMENT OF AGRICULTURE  
IN GERMANY AND THE UK

4. A COMPARISON OF OUTPUT,  
STRUCTURE AND PRODUCTIVITY

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ISBN 0905 378 18 0

ISSN 0306 1345

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THE DEVELOPMENT OF AGRICULTURE  
IN GERMANY AND THE UK

4. A COMPARISON OF OUTPUT,  
STRUCTURE AND PRODUCTIVITY

D. K. Britton

WYE COLLEGE, ASHFORD, KENT, ENGLAND

Miscellaneous Study No. 5

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Price: £5.75

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AGRICULTURE IN GERMANY AND THE UK:

A COMPARISON OF OUTPUT, STRUCTURE AND PRODUCTIVITY

INTRODUCTION

The main purpose of this study, which is one of a series of Anglo-German studies undertaken by the Centre for European Agricultural Studies with the support of the Anglo-German Foundation for the study of Industrial Society, is to examine the following questions:

- a) is it possible, from the statistics available, to reach any broad conclusions as to the relative productivity of British and German agriculture in recent years?
- and b) how far might any difference in productivity, derived from comparisons relating to the respective agricultural sectors in their entirety, be attributable to differences in the farm-size structure between the two countries?

It will be shown that although it is difficult to establish categorically the extent to which British farmers are in general more efficient or less efficient than German farmers - especially if it is agreed that there is more than one way of measuring efficiency - the greater prevalence of small farms in Germany clearly puts German farmers at a disadvantage. It is estimated that the farm-size factor gives British farmers an initial advantage of about 11 per cent, in terms of the resources of labour, capital and land needed to produce a given volume of agricultural output.

The implications of this possible 11 per cent advantage for structural policy within the EEC have not been worked out, but they are an obvious follow-on for further research. It raises questions such as the costs compared with the benefits of pursuing and eventually overcoming this degree of inefficiency.

It could be argued that when advocating changes in the allocation of resources, it is the marginal productivity and not the average productivity of particular resources in given situations which should be the measure of efficiency. Marginal productivity is easy to say, but very much more difficult to measure.

This Miscellaneous Study is presented as a contribution to the continuing debate about the relative competitiveness of the various economic sections of the EC Member States, a debate which is now heightened by the presentation of the EC Commission's proposals for the reform of the budget and of the Common Agricultural Policy, with their increased emphasis on structural change.

It must be remembered that the present size and cost structure of a Member State's agriculture is in part determined by the national goals set for its agriculture by the individual Member States. A drive for a greater degree of self-sufficiency in food supplies, or

a higher proportion of workers to be employed in agriculture, will give rise to an agriculture different from one whose objectives are different.

This report draws upon the results of work carried out by Dr. Helmut Schrader, of the Bundesforschungsanstalt für Landwirtschaft, Braunschweig-Völkenrode, and by Professor Denis Britton and Dr. Berkeley Hill, of Wye College, University of London. The author wishes to acknowledge with thanks the assistance of those who joined in discussion of the procedures and results of the study, especially Professor Dr. Wilhelm Henrichsmeyer (University of Bonn) and Sir Con O'Neill (formerly a member of the Council of CEAS).

SUMMARY

- ... Total production from German agriculture is almost twice the amount produced from British agriculture. This appears to have been a fairly stable relationship (1973-77).  
*(Basis: national sector accounts, using 1970 national prices and 1970 exchange rates).*
- ... The total employment of labour in German agriculture is also about twice the amount employed in British agriculture; but the German level of employment has fallen more rapidly than in UK, so that the ratio between the two countries fell from 2.5 in 1970 to 1.9 in 1977.  
*(Basis: annual labour units, adjusted for part-time employment).*
- ... Gross labour productivity (output per labour unit) has recently been about the same in the two countries. Previously (before 1974), when many more people were employed in German agriculture, the comparison was much more favourable to UK.  
*(Basis: 1970 national prices, 1970 exchange rates, annual labour units adjusted for part-time employment).*
- ... Net labour productivity (net value added per labour unit) was also about the same in the two countries in 1976, but in earlier years was lower in Germany than in UK.  
*(Basis: as gross labour productivity, but deducting value of goods and services purchased for current production purposes, together with depreciation allowance on machinery and buildings).*
- ... An alternative measure of total agricultural production, using grain-equivalent units instead of monetary units, indicates that the ratio between the two countries is not 2 : 1 but only 1.57 : 1 in favour of Germany (1972/73 - 1977/78 average). So the above comparison using monetary units and exchange rates may have been distorted in favour of Germany.
- ... Germany's gross self-sufficiency in food rose from 87 per cent in 1972/73 to 94 per cent in 1977/78; the corresponding figures for UK were 66 per cent and 72 per cent.  
*(Basis: domestic agricultural production as per cent of total human consumption of food, all measured in grain-equivalents).*



... Net self-sufficiency in food, after allowing for imported feedingstuffs, has fluctuated around a level of about 70 per cent in Germany (1972/73 to 1977/78); in UK it rose from 50 per cent to 60 per cent in the same period, because domestic agricultural production increased without any corresponding increase in imported feedingstuffs.

*If Germany had the same farm-size distribution as England and Wales, and the existing output/input ratios at each point in the size-scale continued to apply, then it could be expected that the average level of efficiency in total resource use in Germany might be expected to be increased by about 11 per cent above the present level. In other words, the size-structure in England and Wales could be said to represent an "advantage" to British agriculture of about 11 per cent in terms of the better use of resources which it facilitates.*

COMPARISONS OF AGGREGATES : THE TOTAL ECONOMY AND  
THE AGRICULTURAL SECTOR

Table 1 gives some general economic and demographic indicators for both countries in 1979. It can be seen that there is close similarity between them in terms of population, land area, density of population and number of persons in active employment. The similarity does not, however, extend to the gross domestic product, which was almost twice as high in Germany, with the result that GDP per person in active employment in Germany was almost double that of UK.

In recent years the proportion of gross domestic product represented by gross fixed capital formation has been greater in Germany than in UK, so that in 1978 the total amount invested in this way in Germany was nearly two-and-a-half times the UK amount.

On the other hand, the difference between the two countries in consumption of primary energy was not as great as the figures of gross domestic product might suggest.

Comparisons of industrial wage levels are of special interest in the context of the present study. Broadly speaking, industrial earnings appear to have been about 60-80 per cent higher in Germany in recent years.

Inflation has risen at a much faster rate in Britain than in Germany. Between 1970 and 1979 the cost of living index rose by 205 per cent in Britain compared with only 56 per cent in Germany.

Between 1970 and 1978 exchange rates moved significantly in favour of the German economy, widening the apparent difference in income levels, but between 1978 and 1981 the pound recovered strongly so that in terms of ECU the gap between the two countries has narrowed appreciably compared with what it would be at 1978 exchange rates.

Calculations of the relative purchasing power of national currencies in the respective countries show that the exchange rate does not correspond closely to the real (domestic) purchasing power comparison. Throughout the 1970s the pound sterling was generally worth considerably more within the United Kingdom than the exchange rates would indicate.

The problem of "unreal" exchange rates has been tackled by many economists and statisticians, and frequent attempts have been made to calculate "real" relative purchasing power of currencies. Kravis *et al* <sup>1/</sup> have made the general observation that "the real per capita GDP of low-income countries relative to high-income countries is greater than is indicated by comparisons based on exchange rate conversions of GDP to a common currency." They calculated that in 1970 the real relative purchasing power of the pound sterling against the German mark was about 18 per cent higher than the nominal

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<sup>1/</sup> Kravis, I. B., Heston, A. W. and Summers, R.  
"Real GDP per capita for more than one hundred countries".  
Economic Journal, Vol. 88 No. 350, pp. 215-242.

purchasing power as indicated by exchange rates. By 1974 this discrepancy had widened to almost 50 per cent (ratio, 1.49). Other estimates quoted by Schrader (*op. cit.*) put the discrepancy in 1976 at between 26 and 48 per cent, depending on whether a German or a British pattern of spending is used. However, for the purposes of this study monetary comparisons have been made on the basis of official exchange rates, in the absence of a generally accepted series of real purchasing power conversion rates of D Marks to pounds. The discrepancy must be kept in mind in all the following comparisons which are expressed in monetary terms.

Table 1 General economic comparisons : 1979

	Germany	UK
I. Population ( <i>millions</i> )	61.4	55.9
Land surface ( <i>mn. ha.</i> )	24.9	24.4
of which arable land ( <i>1978</i> )	7.5	6.9
permanent pasture ( <i>1978</i> )	5.2	11.4
forest and woodland ( <i>1978</i> )	7.2	2.1
Density of population ( <i>persons/km<sup>2</sup></i> )	247	229
Active civilian population ( <i>millions</i> )	25.9	26.0
Unemployed (%)	3.4	5.3
Gross domestic product ( <i>000 mn. ECU</i> )	554.1	286.9
GDP per active civilian ( <i>ECU</i> )	21394	11035
Percentage growth in volume of GDP, 1971-79	25	17
Gross fixed capital formation ( <i>000 mn. ECU, 1978</i> )	108.2	44.0
Consumption of primary energy <i>mn. tons oil equivalent</i> )	282	218
Hourly earnings in industry ( <i>males, DM.</i> )	13.25	8.21 (@ 3.88 DM = £1)

Table 1  
(contd.)

General economic comparisons : 1979

(continued)

Rate of exchange (DM/£)		Rate of inflation (consumer price index)		
			Germany	UK
1970	8.78	1970	100	100
1975	5.45	1975	135	184
1976	4.53	1976	140	215
1977	4.05	1977	146	248
1978	3.85	1978	150	269
1979	3.88	1979	156	305
1980	4.22	1980	165	360
March 1981	4.70	Feb. 1981	171	382

Relative importance of agriculture in the economy

Measured by its share in the national gross domestic product, agriculture, forestry and fishing is now of about the same importance in Germany and the United Kingdom. This is in contrast to the situation thirty years ago, when the relative proportions were 11 per cent in Germany and 5 per cent in UK (Table 1A). In recent decades agricultural production has expanded in both countries but in Germany the economy as a whole has expanded much more rapidly than in UK (Table 1B) so that agriculture's share has fallen more perceptibly in Germany, from 5 per cent. in the mid-sixties to 3 per cent. in 1977, while in the same period agriculture's share in the UK has fallen only from 3.2 to 2.8 per cent. Thus the two countries appear to have been converging towards a common figure of about 2.8 per cent.

Table 1A

Agriculture, forestry and fishing  
as per cent. of GDP at factor cost

	Germany	U.K.
1950-51	10.6	5.1
1965	5.0	3.2
1970	3.8	2.9
1975	3.2	2.7
1977	3.0	2.8

Table 1B

Annual growth  
rate in GDP,  
1968-78

3.5	2.2
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Figure 1 Percentage share of agriculture, forestry & fisheries

