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10 Prospects for population and income growth

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INTRODUCTION

The demand for goods and services derived from grassland will be affected in the future by many factors. The rate of growth of population and changes in the level of real incomes will be of major importance.

In the past, these can be seen to have played a major part in the shaping of the agricultural sector. The population growth rates experienced in the 19th century could add 20% to the level of food requirements in a decade. Rapid income growth, accompanied by relatively high income elasticities of demand, also transformed the amount and type of food required.

This paper seeks to establish some future possibilities, with respect to rates of change of population and income, and although it will be argued that precision is not possible in estimating values for the year 2000, it is hoped that some insights will be given into the orders of magnitude involved.

POPULATION GROWTH

Population projection involves estimating values for the future levels of fertility, mortality and migration. These are determined by a mixture of political, economic, psychological, social and medical factors. There are two difficulties in forecasting future population levels. One is in deciding what particular mixture of these factors is going to be decisive in shaping fertility, mortality and migration and the second is in deciding how those factors themselves are going to change in the future.

Inspection of past events reveals that the rate of growth of population,

which had been low and stable, began to accelerate in the 18th century and this was sustained and reinforced during the first three-quarters of the 19th century. There is not much doubt that falling death rates were the main cause of this increase. From the early 1870s onwards, fertility started to decline and continued to decline until the 1930s, since when it has been erratic, although the sizes of fluctuations are small in relation to the massive fertility decline during the 60 years up to 1930.

Although there is little likelihood of major demographic upheavals during the next two decades, barring the possibility of some sudden increase in the death rate through war, nevertheless, the future levels of the UK population can still only be guessed at, and some demographers detect an increasing destabilisation of birth rates in the developed group of countries as a whole. An examination of developments in the British birth rate in the post-war period illustrates this tendency.

The Second World War created its own distortions but was then followed by a period when fertility increased beyond the level of replacement and, after a small drop in the late 1950s, the birth rate peaked in the mid-1960s. The mean completed family size at this time was 2.8. By 1970, although there was some fall off in fertility, it was still high enough to give rise to a steady increase in numbers. In 1964, official Government estimates for the year 2000 gave total population as 66 million (for England and Wales) but by 1970 the estimate had fallen to 58 million.

Since 1970, however, a significant reduction in fertility has taken place, a reduction which is perhaps associated with growing concern about the effect of increasing population on the environment and the quality of life, and a general reduction in optimism concerning the future course of events compared with the heady days of the 1960s. This fall in fertility resulted in completed family size falling to 1.8 by the mid-1970s and some further reductions since then. A completed family size of 1.8, it should be noted, when allowance has been made for mortality, indicates that the replacement of women by daughters in the next generation is only about 85%. The suddenness of the reduction in the 1970s (a drop in fertility of 40% between 1965 and 1975) has, indeed, brought into question the ability of projection methodology to keep pace with events. Brass (1976) has, therefore, argued that the basis upon which estimates have been made, ie, that completed family sizes of generations of women would remain constant or alter gradually, has been proved inaccurate, and that

> '. . . as a consequence, recent population projections have been made by *ad hoc* expedients rather than consistent techniques'. He further suggests that 'we have entered an era of fertility instability, as highly efficient birth control makes the response to social and economic conditions, including ideology and intellectual fashions, sharp and widespread'.

Official Government population projections have, as a consequence, adopted rather guarded tones, eg,

'. . . projections should not be regarded as forecasts or predictions of what will happen. This will depend on the behaviour of individuals and other factors which cannot be foreseen'. (OPCS, 1979b).

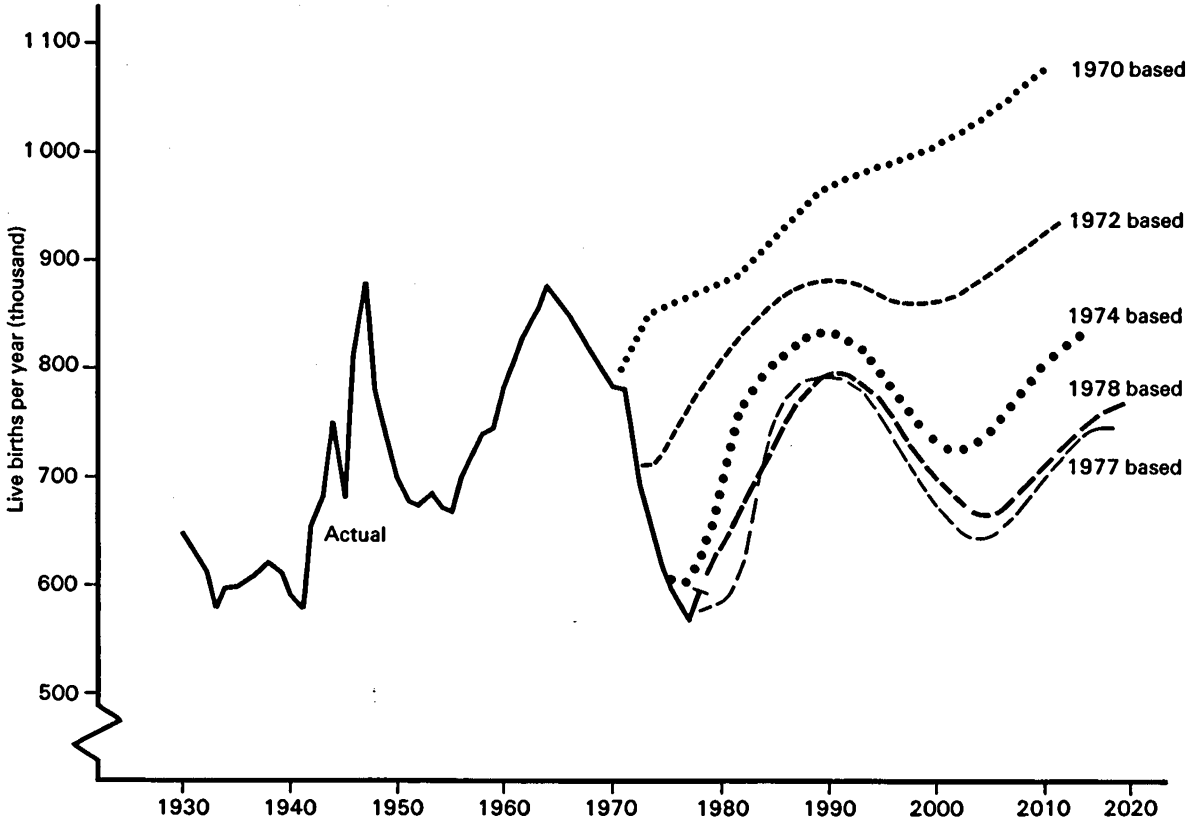
The most recent projections for England and Wales, Scotland and Northern Ireland suggest a total population in the year 2000 of respectively, just over 51 million, 5.2 million and 1.6 million, giving a total UK population of 58 048 000. These projections are based on the mid-1978 population which, itself, is based on the 1971 population census with allowance for births, deaths and net migration since then.

The projections based on the mid-1978 population are similar to those based on the 1977 population but are substantially lower than earlier estimates. The major adjustments have been made in assumptions concerning fertility, although some minor revisions of mortality expectations have also been made. These are confined to a reduction in infant mortality rates which have fallen by about 4.5% per annum during the period 1973–1977. The current assumption is that rates will continue to fall, but at a reducing rate for the next 25 years, and then stabilise.

The adjustments in fertility have been made as a result of an increase of 4.7% in the number of births in 1978 compared with the previous year. Whilst some of this can be explained by an increase in the number of women of child bearing age, the major cause is an increase in the fertility rate (births per year per 1 000 women in the reproductive age group), particularly in the age group 30–39. Thus, 1978 saw a reversal in the trend of the birth rate, which had been downwards from 1964–1977. It is not clear at present whether this marks the beginning of a new demographic cycle. The main variable which seems to have caused recent fluctuations in fertility appears to be the timing of the first child after marriage. The median age at first birth, for women in their first marriage, fell from 24.4 years in 1955 to 23.5 in 1971 and then rose through the 1970s to stand at 24.7 in 1978. A comparison of fertility rates over the last decade and surveys of family intentions indicates that families were not meeting their intentions and the increase in 1978 fertility rates suggests that the fertility rate is adjusting itself to expressed intentions. The past and predicted number of births based on estimates made between 1970 and 1978 are shown in Figure 1.

The predictions for future birth rates are based on the assumption that the total fertility rate continues to increase by about 2% per annum until the late 1980s when it will stabilise at a level which will just allow replacement. The fall in the number of births, between 1990 and the end of the century, results from a fall in the number of women moving into the reproductive age group, which itself is the result of fertility reductions during the 1970s.

Figure 1
Actual and projected live births; England and Wales

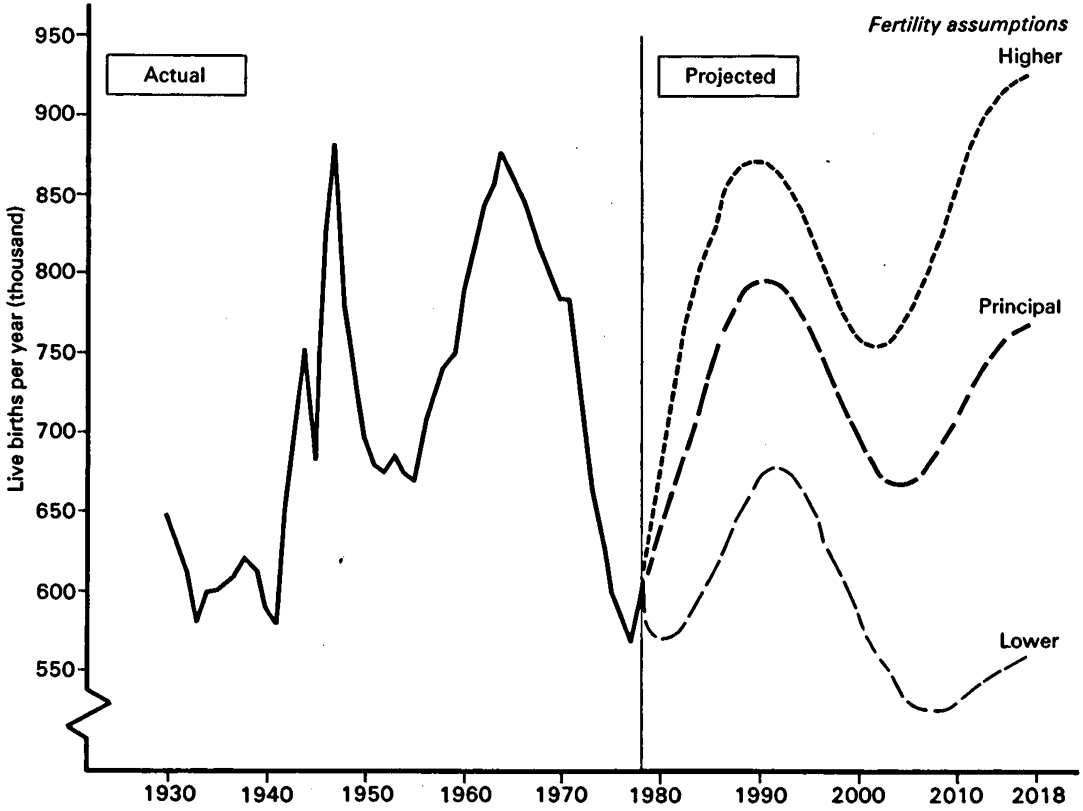


Source: Adapted from OPCS (1979b).

Source: Adapted from OPCS (1979b).

Figure 2

Effect of fertility assumptions on projected live births; England and Wales



Source: Adapted from OPCS (1979b).

In view of the degree of uncertainty concerning the future course of fertility patterns, some attempt is necessary to indicate the effect of varying the assumptions. Two alternative sets of assumptions may indicate the likely range of possible future outcomes. These are:

(i) A continuation of the pattern of late child bearing and low fertility, as seen in the mid-1970s.

(ii) A quicker catching up of postponed births (from the 1970s) and a return to a pattern of child bearing at a lower age plus a higher proportion of larger families.

The effect of these variant assumptions on the future level of births is shown in Figure 2 for England and Wales.

An additional source of uncertainty is the future level of net migration. In 1978/79 net immigration stood at 8 000 and it is assumed to rise until the mid-1980s and then stabilise. Although a net immigration of 8 000 from a mid-year population of over 49 million in 1978/79 seems trivial, it is significant when compared with the population increase between 1978/79 and 1979/80, which was also about 8 000. It will become a much less significant item if the predicted rates of future increase are realised.

Combining the various assumptions concerning fertility, mortality and migration gives rise to the projections for England and Wales and for the UK shown in Figures 3 and 4 and Tables 1 and 2.

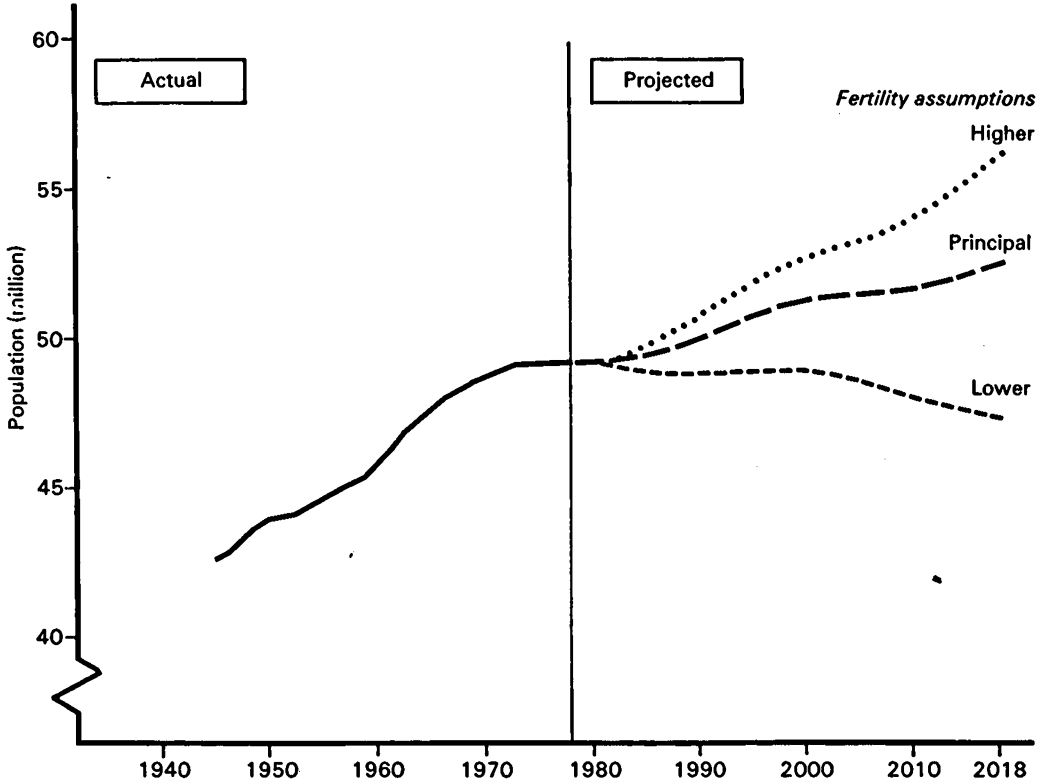
Table 1
Projected populations, 1978 to 2001 (thousand)

Year	England and Wales	Scotland	Great Britain	Northern Ireland	UK
1978	49 175	5 197	54 372	1 531	55 903
1979	49 183	5 185	54 368	1 533	55 901
1980	49 193	5 176	54 369	1 533	55 902
1981	49 219	5 168	54 387	1 535	55 922
1986	49 562	4 708	54 720	1 552	56 272
1991	50 240	5 181	55 421	1 578	56 999
2001	51 270	4 978	56 428	1 620	58 048

Source: OPCS (1979a).

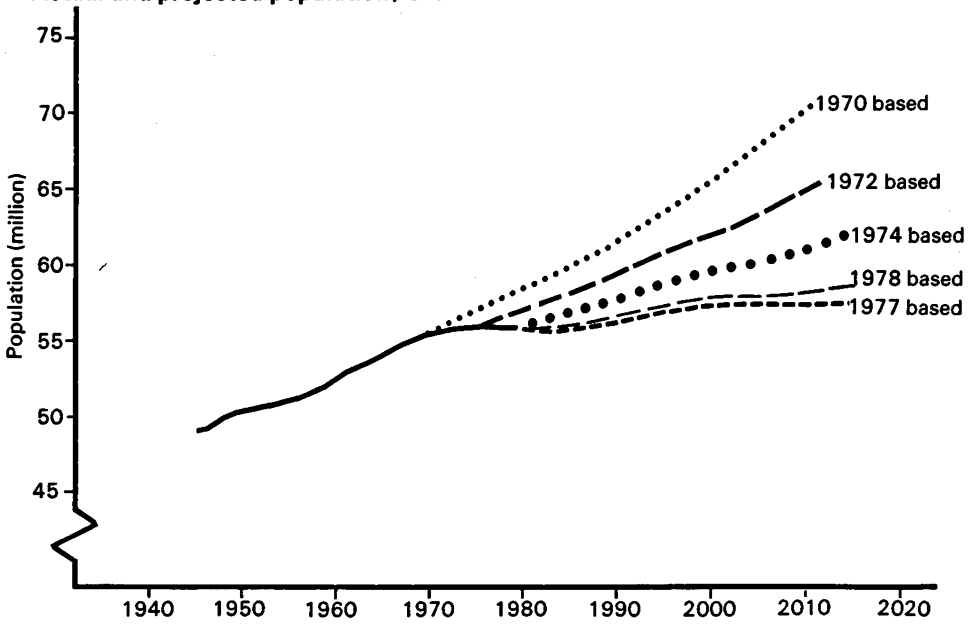
Figure 3

Actual and projected populations, England and Wales



Source: Adapted from OPCS (1979b).

Figure 4
Actual and projected population; UK



Source: Adapted from OPCS (1979b).

It can be seen from Table 2 that the population of Scotland is expected to be lower in 2001 than it was in 1980, mainly as a result of emigration, particularly into England but also to outside the UK. The population of Northern Ireland will grow slightly faster than the population of England and Wales, as a result of slightly higher fertility rates.

Age distribution of the UK population

Important changes are expected in the age distribution of the UK population. The most marked development will be an actual decline in the number of children under the age of 15 by 1.2 million between 1978 and 1986. There will be some recovery after this but a further decline towards the end of the century. The other noticeable change in the age structure will be an increase in the proportion and number of people who are above retirement age. The full effect of this will not, however, be felt until the closing years of the century. Changes in the population age structure do, of course, follow a cyclical pattern. Thus, the increase in the number of post-retirement people around the turn of the century is a result of the post-war baby boom reaching

Table 2
Variant population projections; 1978-based projected population, England and Wales (thousand)

Year	Higher variant	Principal projection	Lower variant
1978 (actual)	49 175	49 175	49 175
1979	49 183	49 183	49 183
1980	49 227	49 193	49 114
1981	49 295	49 219	49 067
1982	49 397	49 256	49 015
1983	49 523	49 308	48 965
1984	49 671	49 374	48 918
1985	49 839	49 458	48 881
1986	50 023	49 562	48 853
1987	50 225	49 680	48 836
1988	50 437	49 811	48 832
1989	50 655	49 951	48 839
1990	50 875	50 095	48 857
1991	51 095	50 240	48 883
2001	52 797	51 270	48 856

Source: OPCS (1979b).

that age. Figure 5 shows changes in the numbers in the five broad age groups from 1951–2018.

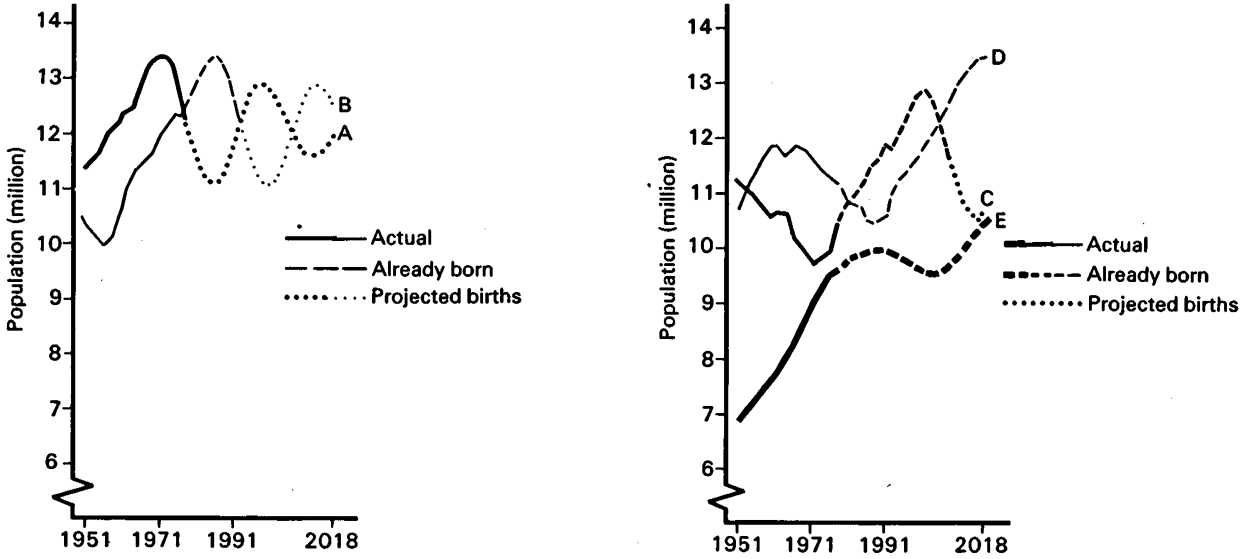
INCOME GROWTH

Demographers, from Malthus onwards, have sought to establish statistical relationships between fertility and material wealth. Intuition or deduction do suggest that children impair family earning potential and compete for limited family resources: family size is, therefore, likely to be related to income earning potential, particularly of the wife. In a macro sense, of course, economists have also considered the effects of population growth on the growth of the economy and, in particular, the implications on the economic prospects of a static or declining population. Population and income growth are not, therefore, unrelated.

It therefore seems likely that, whatever the changes in the size of the UK

Figure 5

Actual and projected population by age group; UK



Notes: A = ages 0–14; B = ages 15–29; C = ages 30–44; D = ages 45–64 for males, 45–59 for females; E = ages 65 and over for males, 60 and over for females.

Source: Adapted from OPCS (1979b).

population, and they are broadly in line with the trends in other developed countries, other factors are likely to have a bigger effect on the level of *per capita* incomes.

If there are problems in predicting changes in the future level of population, these seem trivial compared with those associated with predicting the future course of incomes. The National Institute of Economic Research, whose activities include such attempts, themselves make the point:

> 'It is not possible with probity, to put forward a single set of numbers as having a strong central probability. To suggest that there is such a set is to pretend to have knowledge about the future which we do not have'. (NIER, 1979).

This is not a problem which is unique to the UK economy, but has arisen as a result of the effects of oil price rises and the fight which most developed countries have had, and will continue to have, against inflation.

World outlook

Before looking specifically at some of the possibilities for the UK economy, a review of the world outlook will provide an indication of the economic climate facing the UK in the years ahead.

The OECD group of countries, which is primarily the western industrial countries, showed relatively stable growth rates in national income between 1950 and 1973. Thus, for the group as a whole, the annual increase in real income over this period was between 4.5 and 5%, whilst that of the UK was 2.8%. No major cycles in economic activity took place and no major annual fluctuations in the rate of increase.

In 1973, the first round of oil price increases took place and a sharp reduction occurred in economy growth rates. The overall effect of the oil price rise was, in fact, to halve growth rates in most countries. The present uncertainty (and none of the pre-1973 growth forecasts had anticipated the current slow rate of growth) centres on the extent to which industrial countries can return to pre-1973 rates of growth. The answer to this question depends on the kinds of policies pursued in the developed countries, the supply and price of oil and productivity trends. These three sets of factors are, of course, interrelated.

The major problem facing the industrial countries since 1973 has been inflation and policies have been directed, in most countries, to reducing the rate of inflation rather than increasing the rate of growth. These policies have, in the main, tended to reduce the level of economic activity rather than to respond to the effects of oil price increases by actively promoting growth. The effect of such policies has been more to reduce the level of output and employment than to reduce the level of prices, although individual country

experience varies. It seems clear that most countries will not be prepared for vigorous reflation until they feel that inflation has been brought under control. How long this will take is not an easy question to answer, particularly in the light of further substantial increases in oil prices in late 1979 and early 1980 which have, inevitably, exacerbated the problem.

Not only is it the price of oil which could prevent economic growth, but the actual amount available on world markets. Thus, the OECD suggested, in July 1979, that:

> 'For the first time since the days of immediate post-war recovery there is now a very real risk that the short- and medium-term growth of living standards and employment will be constrained by availability of a key industrial input – energy'. (OECD, 1979).

Efforts to economise in the use of oil have not met with great success. Thus, whilst oil represented 50.6% of all energy in OECD countries in 1970, it had risen to 52.3% in 1978. The faster the rate of economic growth, the greater will be the volume of oil demanded. Thus, a growth in output of 3% per annum in western industrial countries (compared with the longer term trend of 4.5–5%) would require an increase in the volume of OPEC exports of 2% per annum. What are the prospects of OPEC countries meeting such a rise in demand? A complex of economic and political factors will determine their response, but some reluctance on their part would be understandable. In the present world climate, they could probably earn more by producing less than by producing more. Certainly over the last ten years, the value of reserves of oil in the ground has increased by more than most other assets they might have purchased in exchange for it. Between 1970 and 1980 the relative price of oil increased by 17% per annum (ie, price of oil relative to manufactured goods). Whilst it is not anticipated that such rates of increase will be sustained, developments during the last few months suggest that the assumption of annual rates of increase of the *relative* price of oil below 10% per annum may be optimistic. Both the volume of supply and the relative price may, therefore, make output growth difficult to sustain.

A further economic indicator, which has shown a marked decline since 1973, is the rate of increase in productivity in industrial countries. This will be discussed in relation to the UK in succeeding paragraphs, but the UK is not alone in experiencing a slowing productivity growth since 1973. It is a phenomenon which has affected most industrial countries. The average rate of increase for the OECD group has fallen from 4% to 2.5% per annum.

The UK economy

The outlook for the UK economy, in a period of general economic depression, is not encouraging and, although any forecasts beyond the next few years are extremely tentative, there seems little prospect of any significant income

growth during the medium term. As with industrial countries as a whole, but to an extent exceeded only by Italy in Europe, the short-term problem is inflation, which stood at 15.5% per annum in January 1980.

Having identified inflation as the immediate problem, economic policy is focused currently on reducing it, rather than being concerned with longer term issues of economic growth. The two main strands of economic policy are financial targets. First, to reduce the rate of increase in the money supply, and second, to reduce the size of the public sector borrowing requirement (PSBR). These policies, it is hoped, will jointly reduce the rate of inflation and accelerate increases in output in the private sector.

The link between the money supply and the rate of increase of prices is, of course, controversial. Reduction in the money supply may reduce wage settlements by increasing unemployment and decreasing the demand for labour, but there is no clear evidence, at present, as to what the level of unemployment needs to be in order to bring wage settlements down to the desired level, or whether monetary policies do significantly affect wage settlements. It may be that the deflationary effect of money supply reductions will have more effect on output and employment levels than on the rate of inflation. If inflation does not drop sharply, then deflationary policies may be pursued for some time and income growth will be very small over the medium term. Indeed, if the rate of inflation is to come down, it is necessary for annual wage and salary settlements to be below price rises. In other words real incomes need to fall, as they are doing this year, to the extent of about 2%. The situation is exacerbated by the fact that slow productivity does not give much flexibility in wage settlements.

It is hoped that reductions in public sector borrowing will be matched by increases in borrowing in the private sector. However, private borrowing will be affected by general confidence concerning the future and there is no certainty that personal sector investments will rise sufficiently to prevent a fall in income.

Productivity trends

It has already been suggested that reductions in productivity increases have been marked since 1973 and this is particularly true of the UK. The changes in productivity indices are shown in Table 3.

Various theories have been advanced as to why these rates have fallen. A reduction in hours worked per person, changes in the composition of the labour force, employment subsidies, the substitution of labour for energy since 1973 and a fall in real wages between 1975 and 1977 have all been cited in explanation. The fact that nearly every sector, in every country, has been affected since 1973 suggests, however, that it is linked to the slow rate of growth since oil price increases. There is some empirical evidence that

Table 3
Productivity trends, UK 1960–1978; annual average % change in real output per head

	1960–1973	1969–1973	1973–1978	1973–1975	1975–1978
Total manufacturing	3.6	4.3	0.5	–1.8	2.1
Agriculture, forestry and fishing	6.4	7.8	3.6	0.6	5.7
All industries	3.5	3.9	–0.9	–4.2	1.3

Source: NIER (1979).

productivity moves upwards and downwards with output although the direction of causation is not always clear.

If buoyancy of demand is an important determinant of productivity growth, then it is not easy to be optimistic about the future. There are other factors, though, that will have some effect on the level of output per person. One of these is changes in the average number of hours worked per person per week. This has already fallen from 48.5 in 1955 (for full-time men) to 41.0 in 1980 and it is expected to fall to 38.0 by 2000. There is a good deal of uncertainty, however, about these estimates in that they will depend heavily upon the level of demand in the economy and this is itself unpredictable.

The Cambridge Economic Policy Review Group (CEPRG) medium-term projection is that productivity increases will be between 1.3 and 3% per annum (CEPRG, 1979). The higher figure is, however, based on a high growth rate projection and, as that looks increasingly unlikely, it seems sensible to assume a lower productivity growth rate.

Balance of payments

The fact that Britain still has balance of payments problems, despite being well on the way to self-sufficiency in oil, reveals the poor export performance of manufacturing industry and the increasing extent to which imports of manufactured goods dominate total domestic consumption. The value of imports of manufactured goods, as a percentage of the value of exports of manufactured goods, increased from 35% to 90% between 1958 and 1979. The traditional pattern, of imports of fuel, food and other raw materials being financed by net exports of manufactured goods, has been broken. The surplus on the invisible account has also disappeared as a result, mainly, of profits earned by foreign oil companies and high payments to the EC.

The result of these various developments is that the balance of payments

is likely to act as a constraint on the level of economic growth in the UK, although a devaluation, or import controls, would affect the issue. (The CEPRG (1979) has advocated import controls as an essential policy instrument for some time.) The precise course of imports and exports is not, of course, possible to chart. The level of imports is usually related to some index of economic activity within the UK, so if consumer demand remains depressed, imports will not tend to grow, other than as a result of substitution for domestic production. The level of exports in the future will be related to world trade in manufactured goods. Various models have been made of the foreign trade sector, but two general conclusions can be drawn. First, that imports of manufactured goods tend to be highly responsive to indices of UK activity and tend to increase twice as fast as GDP. Second, that exports of manufactured goods, with no change in relative prices, tend to rise more slowly than world trade in manufactured goods. The elasticity of UK manufactured exports, with respect to world trade in manufactured goods, is about 0.75%.

The NIER suggests that a basic dilemma exists between growth and foreign trade transactions. A 3% rate of growth of GDP, in real terms, would give rise to annual rates of increase of 7% in imports and 5.5% in exports; trade surpluses in manufactured goods would disappear by 1985. Whilst changes may occur, such as movements in relative prices or in import propensities, there is no indication at the moment that they will change for the better. Indeed, the evidence of 1979 is that the propensity to import manufactured goods has increased.

The increase in earnings from North Sea oil will cushion the above effects during the 1980s and, by 1985, some small net exports of oil will start to appear, although these are likely to be balanced by imports of coal and gas. The prospects for the later part of the century are not as good, however, and real earnings from oil will decline.

The major impact of the oil industry development during the 1980s will be on the level of Government revenue. It is anticipated that revenues from this source will enable Governments to reduce direct taxation significantly and hence increase personal disposable incomes.

Employment

It is unlikely that major inroads will be made into the level of unemployment until the level of inflation has been reduced; this seems unlikely in the short term. Indeed, further increases are likely during the period 1980–1982 if world recession deepens. The extent to which unemployment falls, after that, depends upon the performance of UK manufacturing industry, the extent to which recovery takes place in the level of public expenditure and overall world trading conditions.

CONCLUSION

Population growth

The UK, like other older industrialised countries, has a relatively stable population and, barring disaster, no violent changes are likely to occur in population levels between now and the year 2000. Population growth between 1979 and 1980 was a fraction of 1% and between 1980 and 1981 it will not be much higher (0.009%). Between 1980 and 2001 the population will increase by 2.15 million if current assumptions are realised, which is an increase of just under 4% on current numbers. Most of the increase will be concentrated in England. Although changes in the size of the population are likely to be small, a good deal of uncertainty exists as to the precise course of events as changes occur in fertility patterns. Thus, whilst revisions of population projections from 1970 to 1977 have resulted in reductions of the projected growth rate of the UK population, the most recent projection, based on the 1978 mid-year population, shows some increase over the 1977 (but only the 1977) estimate. The age structure of the population varies as changes in fertility patterns gradually work their way through various age groups of the population. The most significant changes in age structure during the next 20 years will be a fall in the number of children, of over 1 million by 1986, followed by some recovery in numbers and an increase in the elderly towards the end of the period under consideration.

Income growth

Industrial countries suffered a major reduction in growth rates in 1973 and this particulary affected the UK, whose growth rate was already below that of other OECD countries. Disposable incomes fell from 1974–1977. In 1978 and 1979 there was a boom in private consumption as real private disposable incomes rose following a reduction in the rate of inflation in 1978 and some growth in 1979, accompanied by reductions in direct taxation levels. The main determinants of real income growth in the future will be the success of anti-inflationary policies (not only in the UK but in other industrial countries) which will largely determine the extent to which Governments are prepared to attempt growth orientated policies.

The position in the UK will also depend upon the extent to which a recovery takes place in the competitiveness of manufacturing industry, which itself will be dependent on inflation rates, exchange rate policies and productivity growth. Little income growth can be foreseen in the short term but, depending on the success of anti-inflation policies, some increases are possible over the period up to 1985. Forecasts as to the size of this increase vary. A medium growth scenario would suggest private consumption increasing at about 3% per annum. From 1985 onwards the outlook becomes very blurred, with energy costs and supplies forming an important

unknown and, as far as the UK is concerned, a regeneration of manufacturing performance becoming necessary in order to prevent the balance of payments constraining the rate of growth of domestic income.

The impact of income changes on the demand for food is likely to be slight. Thus, whilst personal disposable incomes rose by 16%, at constant prices, over the period 1970–1976, consumer expenditure on food rose by only 2% (CAS, 1979). A decline in real income levels will have a similarly dampened effect on the level of food consumption. This is not to say, however, that changes in the composition of food consumption will not occur as relative prices change or as income grows. Such effects will be more substantial than overall changes in food consumption levels (CAS, 1979). The higher income elasticities of demand for animal products, compared with most arable enterprises, suggests that income growth will tend to have more effect on grass-based enterprises.

The demand for non-agricultural services from land, particularly recreational activities, are likely to be more sensitive to changes in disposable incomes. Changes in the relative price of oil may tend to have a larger effect than the rates of income growth that seem likely in the medium term.

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