NESC REPORT NO. 7

JOBS AND LIVING STANDARDS: PROJECTIONS AND IMPLICATIONS

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NATIONAL ECONOMIC AND SOCIAL COUNCIL

Jobs and Living Standards: Projections and Implications

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PART I

THE COUNCIL'S COMMENTS*

1. The Council commissioned Professor Brendan Walsh to prepare population projections for the period 1971/86. The results of his study, together with the Council's comments, were published on 21 February 1975.** The Council is at present examining the economic, regional and social implications of Professor Walsh's projections.

2. This report examines some of the implications for employment and living standards. It must be emphasised that it is *not* a plan for achieving full employment. It necessarily has only a limited input of assumptions about economic behaviour. It explores the arithmetic of providing the additional jobs for those who could be seeking employment between now and 1986, on various assumptions about the growth in living standards. This preliminary quantification has to be done if progress is to be made towards the formulation of policies for economic and social development.

3. Professor Walsh estimated that there could be an increase of some 200,000 in the number of men and women seeking work over the period 1971 to 1986. If account is taken of the continued downward trend in the family-farm labour force, the numbers seeking employment outside agriculture could grow by about 300,000. However, even this underestimates the numbers for which employment will have to be provided. New jobs will be required for those who become redundant as a result of technical progress or changes in market conditions.

4. In the past, many Irish people had to emigrate to find work. This reduced the scale of the problem of providing employment in Ireland. In the future, the opportunities for employment outside Ireland may be more limited. This will make the employment problem in Ireland more

*A draft of these comments was prepared by the Economic Policy Committee and discussed and amended by the Council at its meeting on 20 February 1975.

**NESC *Population and Employment Projections, 1971–86* (No. 5), February 1975.

difficult. But it is a problem that must be faced and solved. The objective must, and should, be to provide work in Ireland for all our people who want to work in Ireland.

5. Our terms of reference require us to have regard to the realisation of the highest possible levels of employment at adequate reward. Adequacy is a judgement by those receiving the reward and may increasingly be related to the real rewards elsewhere in the EEC.

6. The problems of providing the new jobs that will be needed and of raising living standards are inextricably interlinked. It is true that the output of material goods, either per head or in the nation as a whole, provides only a very approximate measure of human well-being. It is the latter alone that is important. But there is no way in which human welfare can be objectively measured. In the absence of an objective measure, all that can be done is to record:

> ". . . . the flow of material goods and services, not the satisfactions they are supposed to produce; quantities of foods grown, in lieu of hungers assuaged or pleasures of the table dispensed; the cubic room space per person in lieu of the true quantities of homes; the numbers of schools, of children and masters, or the age groups served by them, in lieu of what they do to form personalities, to improve minds, characters, or skills. And even this measurable flow of material goods and services does not include either objects or services, equally material but as a rule unpriced and therefore unmeasurable, such as the purity of air and water, the pleasures of unspoilt nature or the blessings of privacy ".*

7. However, if hunger is to be assuaged, food must be provided. If families are to enjoy all the qualities of homes, houses must be built for them to live in. If minds, characters or skills are to be improved, schools and other buildings must be built and teachers and other professionals trained. Economic growth at the very least means expanding the country's capacity to meet these needs.

* M. M. Postan: *An Economic History of Western Europe 1945–1964,* Methuen, 1967.

8. But in a democratic society, it is not mere basic needs but what the people want that will determine its economic objectives. In recent years, there can be no doubt that what people want is more and better goods and services. What has been happening can be put simply: those on lower incomes want what those on higher incomes are enjoying. Progress towards satisfying these aspirations cannot be made except by an increase in the volume of goods and services per head of population—that is, by economic growth. Of course, economic growth can create its own problems. This is not an argument against it. It draws attention rather to the fact that economic growth must be planned.

9. Part II of this report explores the gap in living standards between Ireland and other selected European countries. Comparisons are made with the United Kingdom (distinguishing between Britain and Northern Ireland where possible) and a number of small EEC countries (Belgium, Luxembourg, Denmark and the Netherlands) grouped together to form a unit called "Benedelux". This comparison with the small EEC countries shows a wide gap in living standards, because these countries, though small, are among the richest in Europe—indeed in the world.

10. The ideal measure of the gap would be disparities in national income per head. In fact, national accounts generally give a more complete breakdown of gross domestic product (GDP) than they do of national income,* so analysis must proceed on this basis. This is not a major problem as differences in national income usually follow a similar pattern to differences in GDP. But there are problems even with GDP comparisons, of which the following are important:—

(i) as already indicated, GDP (like national income) is an imperfect indicator of living standards. Neither covers, or treats adequately, broader considerations such as conditions of work, the quality of the environment, the services derived from the national stock of housing, the care of young children by mothers who "do not work", and the quality of life generally.

*National income=gross domestic product at factor cost *less* provision for depreciation *less* net factor income from abroad.

(ii) international comparisons are made at current exchange rates. This would be satisfactory if there were no "index number problem" (different countries may not want to consume identical baskets of goods and services), and if exchange rates adequately reflected differences in price levels or purchasing power. In reality, exchange rates are not determined, at least in the short run, by such considerations. They are heavily influenced by narrower, shorter-term considerations such as the proportion of goods and services that are actually traded, external surpluses or deficits, capital flows and interest rate differentials.

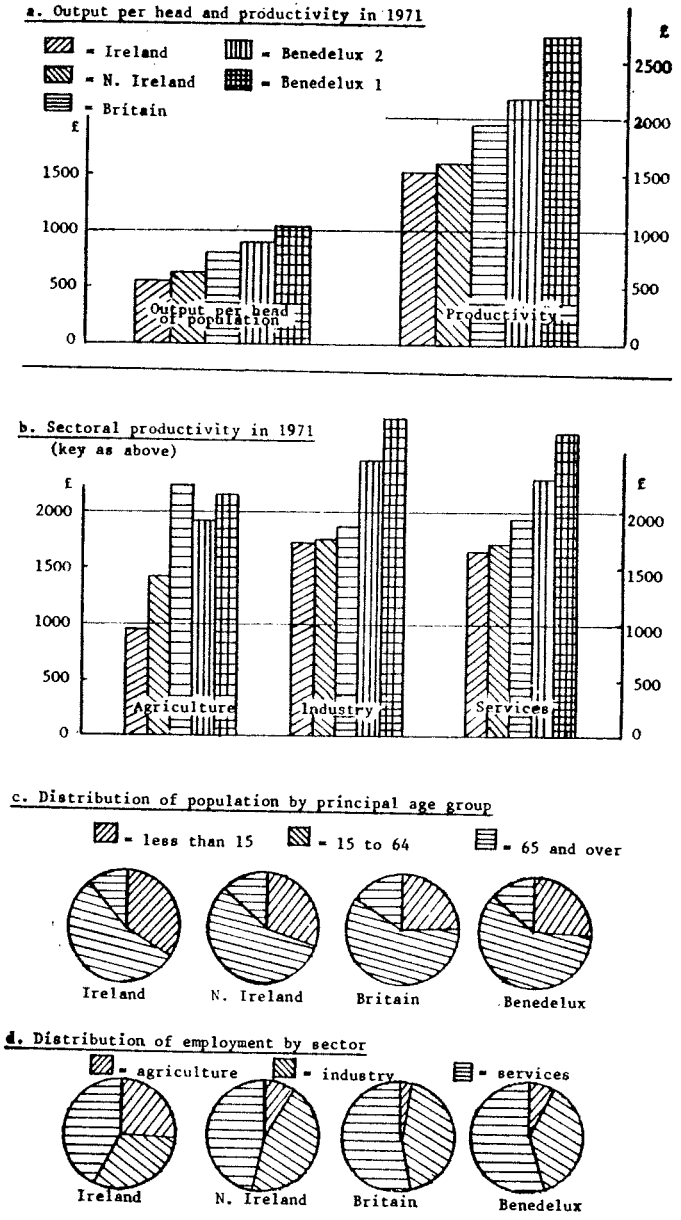
(iii) comparisons based on the latest period for which data are available may reflect short-term influences (such as strikes, short-lived changes in exchange rates, unusually high or low demand pressures). But using average results for a run of years makes the comparisons even more outdated.

(iv) comparisons at the aggregate level say nothing about the uses made of national output (private consumption, government consumption, investment, etc.,) or its distribution among sectors, regions or individuals. These are of importance in assessing the possibility of sustaining the level of national output, the prospects for further growth and the implications for national welfare.

11. Despite these qualifications, the analysis presented in Part II of this paper is useful. First, it is the best that can be done within the resources available to us. Second, the comparison of *changes* in national accounting aggregates probably gives a reasonable indication of relative *changes* in living standards.

12. Part II examines some of the reasons for the shortfall in Irish achievement. A broad distinction is made between the differences in productivity levels (output per person at work), and the number of dependants to be supported by those at work. In both cases Ireland is worse off than her neighbours. Productivity is lower in each of the major sectors of economic activity (agriculture, industry and services)

Diagram 1: Output and productivity



Sources See text for report.

and there are usually higher proportions of dependants (children, old people, and those of working age not actively engaged) than in other countries. Diagram 1 gives an indication of the magnitude of these differences. Diagram 2 looks more closely at the gap in living standards, breaking it down into its major components. Two results are shown for "Benedelux"—Benedelux 1 shows the usual compassion made using current exchange rates, and Benedelux 2 shows the gap when recalculated using a common "international" set of prices.* This Benedelux 2 result probably gives a better indication of the true gap in living standards.

13. It appears that in 1971 output per head of population (i.e. the approximate measure of average living standards) in Northern Ireland was about 15% above that in the Republic. British levels were about 60% higher than those in Ireland, and the corresponding calculations for the Benedelux group show average living standards 70 to 100% above those in Ireland. Diagram 2 shows that only a small proportion of the differences in output per head of population between the Republic and those in either Northern Ireland or Britain is accounted for by differences in output per person engaged in work (i.e. productivity) in individual sectors of economic activity.† Indeed, by 1971 broad sectors of Irish industry were as efficient by this latter measure, as their British counterparts.‡ The gap between Irish and British levels of productivity would be about halved if labour continued to move from agriculture to industry and if the employment of those in the working age groups approached the UK proportion. But if Irish output per head

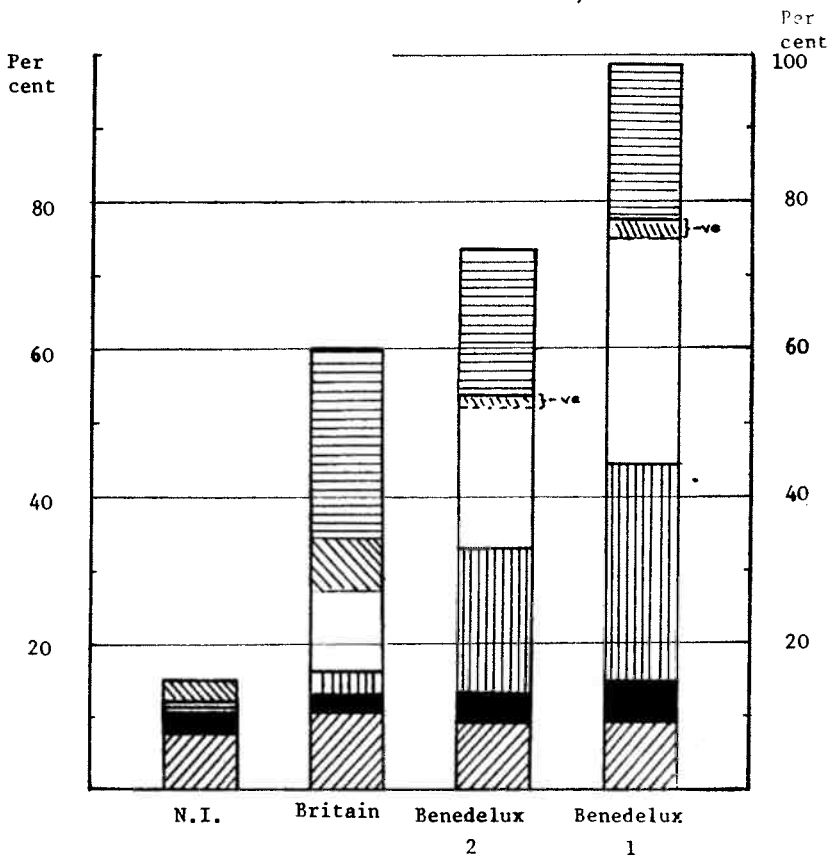
* The result is based on figures for 1970 in *A System of International Comparisons of Gross Product and Purchasing Power*, by Irving B. Kravis *et al.* (UN and University of Pennsylvania, December 1972) which compares the United Kingdom and other countries. The comparision of living standards in Ireland and the UK using national accounts and current exchange rates probably does not produce the same distortions as do other comparisons, since the close links between the two economies make current exchange rates a better proxy for the exchange rate implicit in purchasing power comparisons.

† It should be remembered that the United Kingdom figures exclude transfers between different parts of the UK. For example, in 1974, transfers from Britain to Northern Ireland were about £320 m., or more than £200 per head of population.

‡ See Part II, Appendix 4.

Diagram 2: The gap in living standards

(Per cent in excess of 1971 Irish levels of output per head, i.e. 100 = double the Irish level)



of population were to be brought up to European levels, then not only would employment have to be expanded and concentrated to a greater extent in the higher productivity sectors, but there would also have to be generalised and substantial increases in productivity. Diagram 2 also illustrates the marked differences in dependency ratios between Ireland and abroad and how these depress output per head of population (i.e. average living standards) in Ireland.

14. Ireland's ability to close the gap in living standards will depend on the rate of growth of Irish output and population relative to those in the other countries. The arithmetic of this problem is examined in Part II. The more rapid prospective growth of population in Ireland than elsewhere means that output will have to grow that much faster here if output per head is to catch up with levels elsewhere. Faster population growth could encourage faster growth of output and productivity. More disturbing is the structure of Professor Walsh's projections which, despite their assumed reductions in unemployment, foresee slower growth in employment than in population. This implies that the Irish dependency rate, already very high, is likely to increase. If any gap (measured in terms of output per head of population) is to be completely closed, then Irish productivity would have to be higher than productivity elsewhere.

15. Diagram 3 shows the result of a run of calculations which deduce the required growth rates for the Irish economy if the gap in living standards is to be closed, on different assumptions about growth rates in the other countries. The full range of results shown is clearly unrealistic at the extremes (going from a 23% annual rate if Ireland were to catch up with Benedelux 2 growing at 6% per annum over a five year period, down to 1½% required to catch up with a static Northern Ireland over a 25 year span). However, the Diagram does show how broad a range the possible 'gap-closing' exercises can cover.

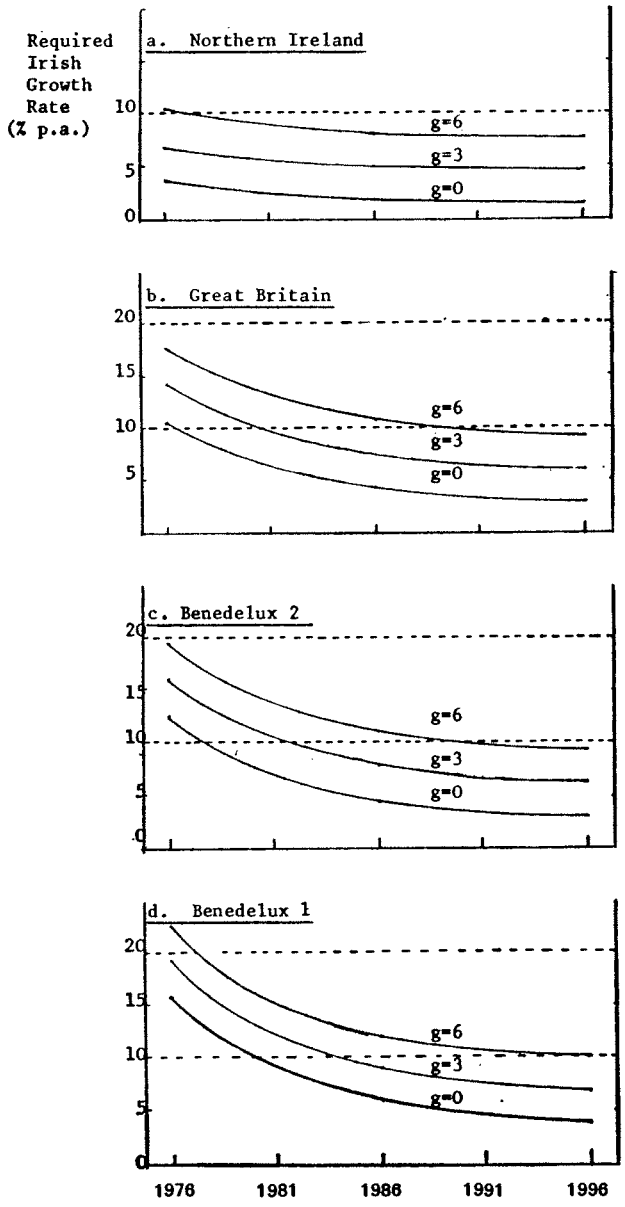
DIAGRAM 3: CLOSING THE GAP

16. The gap is assessed in terms of differences in material standards of living as these are conventionally measured. The limitations of these measures were discussed in paragraphs 6 and 10 above. Since the

gap does not necessarily reflect corresponding differences in human well-being, the closing of the gap cannot be regarded as a social or psychological imperative. However if the fifteen year period to 1986 and a single (and reasonably realistic) growth rate for countries other than Ireland are taken, the Irish growth rates required to close the gap in output per head of population (i.e. living standards) lie in the range 6½-9½%. However, all of these growth rates imply Irish levels of output per person engaged in work (i.e. productivity) by 1986 in excess of those in neighbouring countries. If Irish productivity does not exceed that elsewhere, then the gap in output per head of population will not be closed. Table A gives an indication of how these differences in levels of productivity and output per head can be "traded-off" against each other in an arithmetic sense. For example, if Britain grows at 3% each year to 1986, then Ireland would have to grow at a 5·7% average annual rate to bring Irish productivity (output per person at work) up to British levels. But if this were achieved, British output per head of population would still be 28% above the Irish level, because of the lower dependency ratio. If the gap in output per head of population were to be closed, then Irish GDP would have to grow at an annual rate of 7·4%, which would imply that in 1986 Irish productivity would have to be over 20% higher than British productivity.

17. Since the population and employment projections imply a continuing large proportion of dependants in Ireland, and since it is unlikely that Irish productivity could be raised above European levels, the gap in living standards is unlikely to be closed in the foreseeable future. This raises difficult questions for the distribution of income within Ireland. For example, if there were limits set to the rate of growth of output (for instance, by the growth of domestic savings and capital inflows for investment purposes), then if the Irish community were to insist on the same living standards as those enjoyed elsewhere, employment opportunities would suffer—the strong may achieve these standards and the weak will not be able to find work or will be forced to emigrate. This would happen because sustainable employment at the higher income levels would require higher productivity, which could not be achieved for all because of the constraint on the funds available for investment. For instance, if Ireland were to grow at an annual rate of 5½% (that is, the historic rate of productivity growth

Diagram 3: Closing the gap



The diagram shows the required rate of growth of Irish output (vertical axis) if the gap in living standards is to be closed by a specific date (horizontal axis) and the country in question has a growth rate of 0, 3 or 6 per cent per annum (*g* on diagram).

TABLE A

Growth rates to 1986 required to equate output per head of population and output per person at work

Country	Growth rate assumed abroad	Irish growth rate required	Differences in terminal levels (Overseas less Ireland, % Irish levels)	
			Output per head	Productivity
Northern Ireland	4½	6·6	0	—4
	4½	6·3	4	0
Great Britain	3	7·4	0	—22
	3	5·7	28	0
Benedelux 2	4½	9·4	0	—15
	4½	8·2	18	0

plus the more rapid employment growth assumed in Professor Walsh's projections), this would allow Irish productivity to reach British levels by 1986 (assuming 3% growth there) but would leave Irish living standards some way behind those in Britain (see Table A). However, if those in employment were to demand living standards at European levels, their productivity would have to be higher and (given the constraints on output) employment would in all likelihood be considerably lower in 1986 than it is now.

18. These are only some examples of the type of problem to be faced. The choice of productive techniques will be partly determined by the markets and technologies available abroad, partly by the behaviour of money incomes at home, and partly by fiscal policies. These will in turn influence and interact with the growth and distribution of domestic output and employment.

19. If past performance is a guide to the future, then full employment (on Professor Walsh's projections) by 1986, at living standards obtaining in that year in the smaller EEC countries, is an unattainable objective. But if past performance cannot be improved upon in the future,

then either full employment is achieved while the gap in living standards remains (or grows), or the gap in material standards is narrowed for those in employment but total employment falls below present levels. The major objective of the Irish community must therefore be to improve on past performance. This improvement will not occur spontaneously. It will be achieved only if there is a wholehearted commitment to improving living standards, if this is accompanied by a full acceptance of the necessary policies, and if these policies are shaped by the right kind of economic and social planning.

20. For many years, it has been widely known that the Irish population is rising and that it will continue to grow, and that Irish living standards fall short of those in other EEC countries. Recognition of these facts may contribute something. However, qualitative statements about the policies that might help to narrow the gap in living standards are of limited value. The magnitude of the problems, and the size of the contribution that different policies might make towards resolving them, must be estimated.

21. Professor Walsh's projections, and the study in Part II of the report attempt to *quantify* the growth in population, the increase in the numbers seeking employment, the size of the gap in living standards, and the growth rates in national output, employment and productivity that could be required if full employment is to be achieved and the gap narrowed. These are necessary "pre-policy" exercises. And more such exercises are required—for example, to assess the potential for higher employment and productivity in agriculture, industry and the services sector, to quantify the changes in savings and investment patterns that would be necessary to realise this potential and their implications for the balance of payments, to identify possible constraints on growth and how these might be eased, and to agree on the mix of policies that would bring price inflation in this country down to a more acceptable rate.

22. The limited resources made available to the Council in 1975 mean that we shall be able to do relatively little work this year in these "pre-policy" areas. Meanwhile the numbers needing employment will continue to grow, the gap in living standards may widen further, and the

task of coping with these problems will become still more difficult. These "pre-policy" exercises are therefore urgent and they should be undertaken by the relevant Government departments. We would again emphasise that until problems are quantified (even in broad terms), credible policies to resolve them cannot be formulated. The required growth in employment and living standards will require a plan for economic and social development and its effective implementation. A plan is not a collection of numbers that are consistent with each other. It must be a statement of credible and consistent policies.

PART II

JOBS AND LIVING STANDARDS: PROJECTIONS AND IMPLICATIONS

CHAPTER 1

INTRODUCTION*

1. Professor B. Walsh's population projections** for 1971/1986 are the starting point for this exercise. Professor Walsh estimated the net increase in total employment that would have to be achieved if full employment were to be reached by 1986, on certain assumptions about the possible behaviour of emigration, fertility, marriage and participation rates. Professor Walsh's projections indicated that the total population in 1986 could be between 18% and 27% higher than in 1971. Moreover the structure of the population may have changed considerably from what it was in 1971. For example, the numbers in the age-group 0-14 could grow significantly as a proportion of total population, the proportion of those aged 65 or more could fall, and the numbers of young married couples could double.

2. On the basis of his assumptions, Professor Walsh projected an increase of about 200,000 (from 1·1 million to 1·3 million) in the number of men and women seeking work over the period from 1971 to 1986—an annual average increase of 13,000 to 15,000. He further projected a continued downward trend in the family farm labour force,† with the share of the total labour force declining from 21% in 1971 to under 11% in 1986. As a result of the assumptions relating to emigration, participation rates and the decline in numbers engaged in family farming, he projected that the numbers seeking employment outside agriculture would grow by 300,000 from 0·9 million to 1·2 million. When allowance is made for a reduction in unemployment from 7·3% in 1971 to 4% in 1986, the number of additional new jobs required during 1971 to 1986, could be in the range 300,000 to 340,000. This would require an annual average growth in total non-family farm employment of between 2·1% and 2·4%, depending on the precise assumptions made.

* Drafts of Part II were discussed by the Economic Policy Committee on 5 and 19 September 1974, 16 January 1975 and 7 February 1975. Part II was drafted by Andrew Somerville, who worked in the Council's Secretariat during the summer of 1974.

** NESC *Population and Employment Projections: 1971–86*, No. 5, February 1975.

†i.e. Agricultural labour force excluding farm labourers.

3. For the purposes of this exercise, the "high" estimates have been adopted—that is, the upper bounds of the possible range of changes in population and employment based on the assumptions used in Professor Walsh's projections. The "high" estimates can be summarised in terms of annual average rates of growth over the period 1971 to 1986 as follows:—

Total Population	+1·6%
Total Family Farm Labour Force	−3·5%
Total Non-Family Farm Employment*	+2·4%

4. This part of the report is arranged as follows:—

Chapter 2 is concerned with measuring and analysing the gap in living standards between Ireland and a number of North European countries for the year 1971. *Chapter 3* examines the growth performance required of the Irish economy for the gap in productivity to be closed as well as achieving full employment by 1986. *Chapter 4* discusses the implications of achieving full employment by 1986 on the assumption that real output per person employed grows over the period at the rate achieved in Ireland during the years 1958 to 1971. *Chapter 5* discusses closing the gap in output per person employed (as between Ireland and the smaller European countries), with GDP assumed to grow at the historic level achieved during 1958 to 1971, but with the assumption of achieving full employment by 1986 relaxed. Finally, in *Chapter 6* some of the broad conclusions emerging from the study are discussed.

* The non-family-farm employment growth required for "full-employment" as defined by Professor Walsh.

CHAPTER 2

THE GAP IN LIVING STANDARDS—IRELAND AND OTHER EEC COUNTRIES

5. In this Chapter, comparisons are made with the standard of living in the United Kingdom (distinguishing where possible between Britain and Northern Ireland) and a number of small European countries—Belgium, Luxembourg, Denmark and the Netherlands. The latter countries have also been grouped together for comparison purposes and are referred to for convenience as "Benedelux". Benedelux is therefore a sub-community formed from the continental EEC countries closest in size to Ireland, and it is used as a target towards whose standard of living that of Ireland is aimed in the projections in subsequent chapters. Britain is included in this study, even though it is considerably larger than the other countries in the sample, because Ireland still retains stronger economic links with Britain than with any other EEC country. In particular, Britain is Ireland's most important trading partner, and is the country which has traditionally set the standard for Irish expectations.

6. National income per head of population is frequently used as a measure of international differences in living standards or in levels of economic development. It is not altogether satisfactory for this purpose, its principal deficiencies being:—

(a) it takes no account of intersectoral differences in productivity;

(*b*) it ignores the intersectoral distribution of employment;

(*c*) it ignores the dependency ratio in the population.

This comparison is made in terms of Gross Domestic Product (GDP) per capita for each country. To reduce the shortcomings of the concept, certain other indicators are used. It is hoped that these will

provide more useful standards of comparison. The data used relate to 1971, because that is the latest year for which all the required information is available. The basic information covers output, employment and population.*

7. The use of gross domestic product and its components in making international comparisons raises a number of theoretical and practical difficulties. The range of human activity covered by gross domestic product is arbitrary, and in some societies there may be important outputs which do not pass through the market mechanism and to which it may not be possible satisfactorily to impute money values. An example arising in this study is farm produce consumed on Irish farms.** Adherence to the Standardised System of National Accounts ensures that current price data are comparable in principle, but in fact the concepts are open to a number of different interpretations, and estimation methods may vary from country to country. Availability of data may also vary between countries, and the possibility of measurement error is always present.

8. Gross domestic product is a set of quantities of different physical goods aggregated by means of a set of prices. If the physical quantity, regardless of price, of each good produced by each of two countries in a year could be compared, it would be possible to say only *country A* had produced at least as much as *country B* if it had produced no less of each good than *country B*. Transforming physical quantities into monetary quantities provides us with aggregates which are comparable, and this transformation, since it is performed prior to the collection of the data by the National Income statisticians, incidentally takes care of the problem of measuring physical outputs. However, care must be taken when drawing inferences from such comparisons.

*See Appendix 1.

**"Agricultural income from self employment and other trading income" in the Irish national income statistics includes the (estimated) value of farmers' own produce consumed in farm households without process of sale. The agriculture component of GDP was adjusted by adding £22 million to the published figure, £22 million being the difference between the agricultural and retail values of farm-consumed-farm produce. On this see *National Income and Expenditure 1972*, page 38.

In principle, the relative prices of two goods should reflect the preference society has for one good as against the other, but in fact it cannot automatically be assumed that they do this.

9. Even if this assumption could validly be made, it might well be the case that the price system, while accurately reflecting the weight society placed on each good, ignores certain other factors. For example, the price of steel might well fail to reflect the "disbenefits" to society associated with the atmospheric and other pollution arising from the production of steel.

10. The output data consists of gross domestic product at factor cost at 1971 prices, and the contribution to this aggregate to each of three main sectors. The sectors are:—

(i) Agriculture, forestry, hunting, fishing.

(ii) Industry, comprising:

(*a*) mining and quarrying;

(*b*) manufacturing;

(*c*) electricity, gas and water;

(*d*) construction and building.

(iii) Services, comprising:

(*a*) wholesale and retail trade, hotels, restaurants;

(*b*) transport, storage, communications;

(*c*) finance, insurance, real estate;

(*d*) community, social and personal services, public administration, defence;

(*e*) other.

The Method of Comparison

11. Current exchange rates have been used in the main approach to the inter-country comparisons. However, an alternative approach is adopted for the sub-community "Benedelux" using international comparisons of purchasing power. The latter approach has been adopted because some recent research* has indicated that current sterling exchange rates in 1971 were too low for the purposes of international comparisons of purchasing power.

12. Using the current exchange rate method of comparison, the original data for the continental countries were denominated in national currencies, and then converted to sterling using the exchange rate declared to the IMF by each country in December 1971.** Exchange rates are not indicators of relative purchasing power: at best they relate only to a position of equilibrium in foreign transactions.

13. As an alternative method, a comparison is made using Kravis' results in order to compare the real income of Benedelux with that of the UK and Ireland. While the use of this method is limited by the uncertain quality of the data, it seems worthwhile to introduce the purchasing power method of comparison, if only to indicate that there is nothing sacrosanct about the normal method of intercountry comparison. The method developed by Kravis bases real income comparisons on revaluation of expenditures in different countries using a common "international" set of prices. In this exercise, the current exchange rate comparison and the purchasing power comparison of Benedelux and UK/Ireland are distinguished by labelling the comparisons "Benedelux 1" and "Benedelux 2" respectively.

14. The first step is therefore completed in terms of the necessary exchange rate adjustments for "Benedelux". The next step was to compute, for each country, gross domestic product per head of population and per person as work, hereafter referred to as "output

*A System of International Comparisons of Gross Product and Purchasing Power, Irving B. Kravis *et al.*, Dec. 1972, UN and University of Pennsylvania (Preliminary).

**Alternative values using the Smithsonian exchange rates are also presented (see Appendix 2)—the quantitative results presented in this section of the report would not alter much if these values were used, and the qualitative conclusions would be unaltered.

per head" and "productivity" respectively. These are shown in Table 1 as indices, taking the Irish values equal to 100 in each case. From the examination of the indices in Table 1, it is clear that Ireland has the lowest value in the sample for both indices.

TABLE 1

Indices of output per head and productivity, 1971

	Ireland	Britain	Northern Ireland	Belgium and Luxem-bourg	Denmark	Nether-lands	Benedelux 1	Benedelux 2
Output per head	*100*	160·1	114·3	199·5	255·2	175·3	198·0	171·5
Productivity	*100*	127·2	111·5	175·7	188·4	173·8	177·6	153·9

Note: Benedelux 1 refers to comparison in terms of exchange rates. Benedelux 2 refers to comparison in terms of purchasing power.

15. The indices in Table 1 have, however, to be interpreted in relation to the proportion of the population of working age in the different countries. A breakdown of population into the age-groups under 15, 15–64 years and over 65 years is given in Table 2. From Table 2 it can be seen that Ireland has the lowest proportion of total population in the working age group (i.e. 15–64 years). Accordingly, when Ireland is compared with a country having a considerably lower dependency rate* such as Denmark or Britain, the gap is narrower when comparing output per person employed (i.e., productivity), than is the case for overall output per head.

TABLE 2

Percentage of population in three main age groups, 1971

	Ireland	Britain	Northern Ireland	Belgium and Luxem-bourg	Denmark	Nether-lands	Benedelux
Under 15	31·3	24·1	30·0	23·6	23·1	27·1	25·1
15–64	57·6	62·9	59·2	63·0	64·1	62·7	63·1
65 and over	11·0	13·0	10·8	13·4	12·5	10·3	11·8

*i.e. the number of young and old persons per 100 persons in the "active" age groups 15-64 years.

16. If the fact that Ireland has a higher dependency ratio than the other countries is accepted, then the main concern must be with the efficient use of existing resources. Total population is an upward-biased measure of Ireland's manpower resources so that comparisons of output per head make it appear that relative to (say) Denmark, Irish resources are used less efficiently than is in fact the case.

17. Taking productivity in the different sectors produces some interesting comparisons for the countries in the sample. Table 3 sets out the data, using Ireland as the benchmark for each sector.*

TABLE 3

Sectoral outputs per head expressed as indices, taking Ireland as the benchmark in each sector (1971)

Sectors	Ireland	Britain	Northern Ireland	Belgium and Luxem-bourg	Denmark	Nether-lands	Benedelux 1	Benedelux 2
Agriculture	*100*	218·5	145·6	242·4	195·2	215·9	215·3	186·6
Industry	*100*	107·6	100·6	155·8	174·0	164·8	163·0	141·3
Services	*100*	118·6	101·6	159·7	176·1	153·2	160·2	138·8

Note: Benedelux 1 refers to comparison in terms of exchange rates. Benedelux 2 refers to comparison in terms of purchasing power.

Examining the second row of Table 3 (the industrial sector), it can be seen that although Ireland's industrial productivity was below those of Northern Ireland and Britain, the difference is negligible in the first case, and only 7·6% in the second. However, Ireland's industrial productivity is low by the standards of the continental countries, and since a greater proportion of Irish employment was in agriculture (a sector with a considerably lower productivity in the Republic than in the North or in Britain), the result was lower total productivity in Ireland despite the similarity of industrial productivity in the different parts of this archipelago.

* For a fuller examination of the industrial sector see comparisons in Appendix 4 to this report.

18. The significance of productivity in the industrial sector can be highlighted by taking each country's industrial sector as a benchmark for the agricultural and services sectors. Table 4 sets out the data, which indicate the output per head in services does not vary significantly in relation to industrial output per head in the different countries. However, in the case of output per head in agriculture the inter-country index varies between 59 and 120, with Ireland at the lowest point of this range.

TABLE 4

Sectoral outputs per head expressed as indices, taking each country's industrial sector as benchmark for its other two sectors, 1971

Sectors	Ireland	Britain	Northern Ireland	Belgium and Luxembourg	Denmark	Netherlands	Benedelux
Agriculture	58·6	118·9	84·8	91·0	65·7	76·7	77·3
Industry	*100*	*100*	*100*	*100*	*100*	*100*	*100*
Services	95·2	104·9	96·1	97·6	96·4	88·5	93·6

19. The data in Table 4 have, however, to be seen in relation to the numbers employed in the different sectors. The distribution of employment in the three main sectors is given in Table 5. Tables 4 and 5 taken together illustrate the interaction of productivity and employment patterns. For example, Irish agricultural productivity was 58·6% of industrial productivity; the country with a figure closest to this is Denmark with 65·7%. Yet in Denmark only 10·7% of the labour force was engaged in agriculture compared with 25·9% in Ireland.

TABLE 5

Percentage distribution of employment by three main sectors

Sectors	Ireland	Britain	Northern Ireland	Belgium and Luxembourg	Denmark	Netherlands	Benedelux
Agriculture	25·9%	2·5%	9·5%	4·5%	10·7%	6·8%	6·8%
Industry	30·6%	45·0%	42·4%	43·3%	36·5%	37·1%	39·2%
Services	43·5%	52·5%	48·1%	52·1%	52·8%	56·1%	54·0%

20. Diagram 1 (page 9) summarises the data set out in the foregoing tables.

Analysis of the Gap

21. It has been shown that among the main factors which contributed to the gap in material living standards between Ireland and the other countries studied using 1971 data were:

(i) The relatively high proportion of the Irish workforce employed in agriculture, which was the sector with the lowest productivity.

(ii) The relatively high ratio of dependants to total population in Ireland.

(iii) Relatively low productivity in each sector.

(i) and (iii) explain the difference between overall productivity in Ireland and in the other countries, while (ii) is responsible for the gap between overall productivity and output per head being wider in Ireland.

22. The factors which contribute to the gap in living standards as between Ireland and other EEC countries can be examined in diagrammatic form. Diagram 2 (page 7) illustrates the extent to which output per head of population exceeded Irish levels (1971) in percentage terms. The overall excess is broken down into its components—basically, greater proportions of the labour force in higher productivity industries, higher productivity in each sector, a larger proportion of the population aged 15 to 64 in employment, and a smaller proportion of dependants (children, and adults who have reached retirement age). Only in two cases (Northern Ireland has a greater proportion of dependants than the Republic, and activity rates are lower in Benedelux) are there components which tend to bring living standards back towards those in Ireland.

Some Conclusions

23. In 1971 output per head was substantially higher overseas than in Ireland. The higher proportion of dependants in Ireland explained a considerable proportion of the gap if comparisons are restricted

to Britain. But, when comparing Irish levels and continental levels, the fact that Irish productivity was lower in each sector is much more important in explaining the gap than either the higher Irish total dependency ratio, or the fact that a relatively high proportion of Irish employment was in the sector with lowest productivity (agriculture).

24. The factors which have been identified in Diagram 2 as contributing to a gap in living standards are in turn the factors which can influence growth favourably or adversely. The OECD has estimated the contribution of various factors to the growth of output during 1958/1968.* The OECD estimates for Ireland expressed as percentages of the total percentage increase in output over the period are set out in Table 6. The report from the OECD notes that the shift out of agriculture into higher productivity industries has been an important source of increased productivity in the whole economy. It can be seen from Table 6 that the contribution to growth from increased productivity formed about 70% of the total growth in the period under review.

TABLE 6

Source of growth of output: Ireland, 1958-68

Source of Growth	As percentage of total percentage increase
Sectoral employment shift	31·1
Growth in employment	—0·6
Growth in agriculture output	30·6
Growth in industrial productivity	27·5
Growth in service productivity	11·4
Growth in total output	100·0

*See *Growth of output, 1960–1980* (OECD, Paris, 1970), Table 9.

CHAPTER 3

SOME IMPLICATIONS OF CLOSING THE GAP

Methodology

25. This Chapter is concerned with the growth rates of gross domestic product required for Ireland to attain by 1986 the productivity of Northern Ireland, Britain and Benedelux as measured by output per person employed, while attaining full employment at the same time.* The terminal date was chosen to be 1986 for two reasons. First, it enables Professor Walsh's population and employment projections to be used in this paper. Second, it is sufficiently near to be of interest to most people alive today, while it is not so close to the present as to require unreasonably large growth rates to close the gap in living standards.

26. In most of the following, gross domestic product is projected forward fifteen years at varying growth rates for the different countries under review in order to arrive at levels and rates of change which Irish output would have to achieve by 1986 to close the gap.

27. At this stage the projections of population and employment growth for the period 1970-1980 which have been published by the OECD are used. Also, by way of background the OECD output projections are included. These projections are set out in Table 7 for the United Kingdom and the continental countries.**

* Benedelux being the "sub-community" comprising Belgium, Luxembourg, the Netherlands and Denmark, treated in terms of current exchange rates and purchasing power (Benedelux 1 and 2 respectively).

** It should be noted that the OECD projections for population and employment are taken as data but the growth rate of output is treated as a variable to which arbitrary values are assigned. The implicit assumption that the population/employment projections can be created independently of output is a simplifying assumption adopted for the purposes of this exercise.

Overall Growth Rates

28. The rate at which the Irish economy would have to grow by 1986 is dependent not only on the growth necessary to accommodate the increases expected in the labour force, but is also dependent on the assumptions made regarding the growth in the British and Benedelux economies. A range of figures has, accordingly, been prepared and this is set out in Table 8. This table indicates how the adoption of significantly higher rates of growth for Britain and Benedelux results in required rates for Ireland which are so high that the prospect of attaining them must be judged remote.

29. As mentioned already, the population and employment projections used here are those made by Professor Walsh. This in turn involves adopting the assumptions underlying Professor Walsh's projections. From the alternative sets of projections presented in Professor Walsh's paper, only that based on his Population Projection 2, and family farming projection B, is used. All the Projection 2 growth rates of interest here are higher than those based on Projection 1.

TABLE 7

Rates of growth of output, population and employment 1955-1968 (trend) and 1970-1980 (projections)

Average annual percentage rates of change

	Population		Output		Employment	
	1955–1968	1970–1980	1955–1968	1970–1980	1955–1968	1970–1980
United Kingdom	0·6	0·5	2·8	3·1	0·5	0·3
Belgium	0·6	0·2	3·9	4·7	0·4	0·6
Luxembourg	0·8	0·7	3·8	3·0	0·5	0·6*
Denmark	0·7	0·4	4·8	3·8	1·3	0·1
Netherlands	1·3	1·1	5·1	4·6	1·0	1·0

Source: OECD, *Growth of Output 1960–1980,* Tables 3, 4, 21; OECD, *Growth of Expenditure 1960–1980,* Table A3.

* No estimate is available for Luxembourg—the rate for Belgium has been assumed.

TABLE 8

Required rates of growth of GDP to close the gap in productivity between Ireland and some EEC countries

Alternative Growth Rates of GDP for other countries	% GDP Growth Rate for Ireland			
	Northern Ireland	Britain	Benedelux 1	Benedelux 2
0%	1·8%	2·6%	4·5%	3·5%
3%	4·9%	5·7%	7·6%	6·6%
4½%	6·4%	7·2%	9·2%	8·2%
6%	7·9%	8·8%	10·8%	9·7%

Note Benedelux 1 refers to comparison in terms of exchange rates. Benedelux 2 refers to comparison in terms of purchasing power

30. Of the sixteen alternatives set out in Table 8, it should be noted that ten of the growth rates exceed 6 per cent. According to OECD estimated,* only two OECD countries achieved average annual rates of growth during 1965-1970 of the order, or greater than, 6 per cent. These were Italy and Japan, in which GDP grew at 6·3% and 12·4% respectively, and GDP per person employed grew at 6·8% and 10·8% respectively. This gives an indication of the magnitude of the task of closing the gap as between Ireland and either Britain or Benedelux.

31. If output grows as projected in Tabe 8 so as to close the gap in productivity, then it follows that in 1986 there will remain a gap in living standards although it will be reduced from its 1971 level. This is a result of the projected growth of Irish population relative to employment exceeding that of the growth of population relative to employment elsewhere. The extent to which living standards would be below those of the other areas is summarised in Table 9.

*See *Growth of Output 1960–1980,* OECD, Paris, 1970. Table 2.

TABLE 9

Projected Indices of Output per head of Population, 1986, if Irish productivity levels are equal to those abroad

	Ireland	Northern Ireland	Britain	Benedelux 1	Benedelux 2
Output per head of population	100	102·4	127·7	118·2	118·2

Note The numbers in this table are independent of the alternative projections for the rates of growth of GDP in the other countries.

32. It is assumed that the population and employment projections are not influenced by the performance of GDP. The growth rates set out in Table 9 are therefore independent of changes in other economic and social parameters. Such parameters are important, particularly in the context of forecasts of future developments. However, in the context of this paper the derived figures for the rates of growth of GDP and of productivity are based on the implicit assumption that Dr. Walsh's projections for total population would not be incompatible with the growth rates of output per head set out in Table 9.

CHAPTER 4

TREND GROWTH OF PRODUCTIVITY IN IRELAND MAINTAINED

33. In this chapter the implications of achieving full employment by 1986, on the assumption that real output per person employed grows over the fifteen-year period at the rate actually achieved during the years 1958 to 1971, are examined.

34. On the basis of the projections of employment prepared by Professor Walsh and assuming the historic growth of 4·2% in real output per person employed, the following growth rate of GDP is derived:

GDP average annual growth rate: 1971–1986	5·6%

35. The implications of growth in GDP of 5·6% can now be examined with regard to living standards in 1986 on the basis of Professor Walsh's population projections. Table 10 presents the resultant living standards for Ireland in relation to some of the other EEC countries. In circumstances where it is assumed that there is no growth of output in other countries, the Irish living standard would in fact exceed that of such countries. However, with the exception of Northern Ireland, once moderate growth is assumed for other countries, a gap in living standards would remain in the light of the assumptions adopted in this particular Chapter.*

* i.e. assuming Professor Walsh's population and employment projections together with a historic growth of real output per person employed of 4·2%.

TABLE 10

Projected indices of output per head of population, 1986 (assuming an annual Irish growth rate of 5·6 per cent)

Alternative growth rates of GDP for other EEC Countries	Ireland	Northern Ireland	Britain	Benedelux 1	Benedelux 2
0%	100	59·4	83·2	1 01·4	87·89
3%	100	92·6	129·7	158·0	136·8
4·5%	100	115·0	161·1	196·3	170·0
6%	100	142·4	199·5	243·1	210·5

CHAPTER 5

TREND GROWTH IN GDP IN IRELAND MAINTAINED

36. This chapter assumes that the average growth rate between 1958 and 1971 (4·1%) is maintained up to 1986. Table 11 below presents the implications for average living standards in 1986 in the same manner as Table 10.

TABLE 11

Projected Indices of output per head of population, 1986 (assuming an annual Irish growth rate of 4·1 per cent)

Alternative Rates of GDP growth for other countries	Ireland	Northern Ireland	Britain	Benedelux 1	Benedelux 2
0%	100	73·7	103·2	125·7	108·9
3%	100	114·8	160·7	195·8	169·6
4·5%	100	142·5	199·7	243·3	210·7
6%	100	176·5	247·2	301·3	260·9

37. This chapter also goes somewhat further, examining some of the implications of this growth rate with continuing large discrepancies in living standards between Ireland and her EEC partners. There could be constraints on the growth of Irish output—for example, slow growth of domestic savings and investment. While such constraints would not be absolute, the above table illustrates what the implications of severely constrained growth in output could be. Some might find these implications unacceptable.

38. But if some members of the Irish community were to insist on the living standards comparable to those enjoyed abroad, these

standards could only be attained and sustained, presumably, if these people also raised their productivity levels to those of the other countries. And if some people's productivity is to be raised, this presumably requires further investment in their particular plant or factory. This in turn implies less investment elsewhere, assuming some constraint on the sum available for investment. In these circumstances, higher productivity in some sectors would mean lower productivity or less employment in others.

39. In the extreme case, if all those in employment were to seek the same living standards as those obtaining elsewhere, only those who attained the external levels of productivity would remain in employment. Those who did (or could) not attain these levels would be forced out of employment, or would find it impossible to find jobs. Such cases are illustrated in Table 12 below. There it is assumed that an Irish growth rate of 4·1% is somehow "imposed", that other countries grow at particular rates, and that Irish productivity (i.e. Irish output per person in employment) is brought up to the levels in these countries. The table shows the implied rates of growth of Irish employment and the shortfall in employment (i.e. the numbers who would not be able to find jobs here).

TABLE 12

Reference country for living standards and productivity	Northern Ireland	Britain	Benedelux 1	Benedelux 2
Rate of growth of output in reference country (% p.a.)	4½	3	4½	4½
Rate of change in Irish employment if productivity gap closed (% p.a.)	—0·9	—0·2	—3·5	—2·5
Employment shortfall in Ireland in 1986 (thousands below Professor Walsh's "full employment")	400	300	700	600

40. The implications of Table 12 for unemployment and/or emigration are clearly disturbing. The assumption underlying the table (historic growth of GDP but with efforts to achieve the levels of real income obtaining in the other countries) are too rigid and the calculations are too mechanical. Moreover, if this path were embarked upon, the assumptions underlying the calculations would break down long before the situation described in the table was reached. However, the arithmetric exercise does illustrate the danger to employment if the living standards to which people aspire are rising faster than the economy's capacity to meet them.

CHAPTER 6

SOME BROAD CONCLUSIONS

41. The aim of this study was to examine the broad implications of achieving full employment by 1986 under varying assumptions regarding growth of output and productivity. As was pointed out in the Introduction, the study incorporated only a limited input of assumptions regarding economic behaviour. The population and employment projections produced by Professor Walsh have been used (except in part of Chapter 5 where the assumption of full employment was relaxed).

42. Having established the gap in productivity and living standards as between Ireland and the other EEC countries in Chapter 2, the main emphasis of the subsequent chapters was to measure how output would have to grow if full employment were to be achieved together with the levels of productivity projected for other countries.

43. If 4½% annual growth of output is taken as a representative figure for other countries,* then if Ireland is to achieve full employment *and* European productivity levels a growth rate over the period of up to 9% would be required. On the other hand, if the historic Irish trend for productivity were to continue *and* if employment were to expand in line with Professor Walsh's projection, then (again taking output growth elsewhere at 4½%) the gap would not alter radically compared with 1971 standards of living (see Table 10).

44. Furthermore, catching up with productivity levels elsewhere will not bring Irish living standards into line with those abroad, because of the continuing high dependency ratio here. If this is not recognised, and if stronger sections of the community insist on the living standards enjoyed elsewhere, then employment opportunities will suffer.

* See Table 7.

45. Finally, it must be emphasised that this exercise merely illustrates the arithmetic of growing sufficiently fast to close gaps in productivity, as well as achieving full employment. It must be left for further research to examine the implications of the means by which such higher growth rates can be attained. This in turn would involve examining the role of such factors as investment, savings, capital inflows, education and technical training.

APPENDIX 1—Data for 1971

	Belgium and Luxembourg	Denmark	Britain	Ireland	Netherlands	Northern Ireland	Benedelux
Millions:							
Population	10·015	4·963	54·134	2·978	13·194	1·534	28·172
Employment	4·029	2·382	24·148	1·055	4·715	0·557	11·128
: agriculture	0·183	0·256	0·612	0·273*	0·319	0·053	0·758
: industry	1·745	0·869	10·868	0·323	1·750	0·236	4·364
: services	2·101	1·257	12·660	0·459	2·646	0·288	6·004
£ million							
GDP, factor cost	10 790·42	6,838·65	4,6799	1,608·0	12 490·11	947	30,119·18
: agriculture	454·08	511·56	1,369	279·5	705·07	79	1,670·71
: industry	4,753·22	2,642·64	20,447	564·6	5,040·76	415	12,436·62
: services	5,583·12	3,864·45	24,983	763·9	6,744·28	453	16,011·85
% total employment							
: agriculture	0·045	0·107	0·025	0·259	0·068	0·095	0·068
: industry	0·433	0·365	0·450	0·306	0·371	0·424	0·392
: services	0·521	0·528	0·525	0·435	0·561	0·481	0·540
£							
Output per head	1,077·4	1,377·9	864·5	1,524·2	946·7	617·3	1,069·1
Productivity	2,678·2	2,871·0	1,938·6	540·0	2,649·0	1,700·2	2,707·1
: agriculture	2,481·3	1,998·3	2,236·9	1,023·8	2,210·3	1,490·6	2,204·1
: industry	2,723·9	3,041·0	1,881·4	1,748·0	2,880·4	1,758·5	2,849·8
: services	2,657·4	2,931·1	1,973·4	1,664·3	2,548·9	1,690·3	2,666·9

*See footnote ** on Page 21.

Sources:

1. *Belgium and Luxembourg; Denmark; Netherlands;*
   Population and Employment Statistics:—*Labour Force Statistics 1960/1971*, OECD, 1973. Output Statistics: see Appendix 2.
2. *Great Britain; Northern Ireland;*
   UK Population and Employment Statistics: *Labour Force Statistics 1960-1971*, OECD, 1973.
   UK output statistics: *National Income and Expenditure*, HMSO, 1972.
   Northern Ireland Output and Employment Statistics: *Northern Ireland Economic Report*, 1972.
   Ministry of Finance, 1973.
   NI Population Statistics: Census, 1971.
   Statistics for Great Britain were obtained by subtraction.
3. *Ireland*
   Trend of Employment and Unemployment In 1972: Stationery Office, 1973.
   National Income and Expenditure 1972. Stationery Office, 1973.

APPENDIX 2

Alternative Data for the Continental countries derived using Smithsonian exchange rates for converting their national-currency data to Sterling

	Belgium and Luxembourg	Denmark	Netherlands	Benedelux
£ million				
GDP, factor cost	10,288·4	6,540·23	11,941·10	28,769·87
: agriculture	432·96	489·23	674·08	1,596·27
: industry	4,532·14	2,527·32	4,819·19	11,878·65
: services	5,323·14	3,523·67	6,447·83	15,294·94
£				
Output per head	2,553·6	2,745·7	2,532·6	2,585·8
Productivity	1,027·3	1,317·8	905·0	1,021·2
: agriculture	2,365·9	1,911·1	2,113·1	2,105·9
: industry	2,597·2	2,908·3	2,753·8	2,722·0
: services	2,533·8	2,803·2	2,436·8	2,547·5

APPENDIX 3

Supplementary Tables derived from data in Appendix 2

Supplement to Table 1

Output per head and overall productivity expressed as indices based on the Irish values as benchmark =100

	Belgium and Luxembourg	Denmark	Netherlands	Benedelux
Output per head	190·2	244·0	167·6	189·1
Overall Productivity	167·5	180·1	166·2	169·6

Supplement to Table 3

Sectoral outputs per head expressed as indices taking the Irish sectoral value as benchmark =100 in each sector.

Sectors	Belgium and Luxembourg	Denmark	Netherlands	Benedelux
Agriculture	231·1	186·7	206·4	205·7
Industry	148·6	166·4	157·5	155·7
Services	152·2	168·4	146·4	153·1

APPENDIX 4

The Industrial Sector

1. The Industrial sector merits a more detailed analysis than that so far made.

2. As defined in this paper, the industrial sector includes four subsectors:—

(*a*) Mining and Quarrying—here called simply mining

(*b*) Manufacturing

(*c*) Electricity, Gas and Water—here called utilities

(*d*) Building and Construction—here called construction.

3. For four of the chosen countries, data is available for the subsectoral contributions to Gross Domestic Product at Factor Cost. These are Belgium and Luxembourg, Britain, Denmark and Northern Ireland. In the case of Denmark and Northern Ireland, the sectors "Mining and Quarrying" and "Manufacturing" are combined.

4. In the absence of Irish data on subsectoral contributions to GDP, the figures for net output in the 1971 Census of Industrial Production* are utillsed. The CIP figures are biased estimates of the actual sectoral and subsectoral outputs, for two reasons. CPI net output is a market price concept, and this causes upward bias. Secondly the CIP excludes industries employing fewer than three persons, and this gives rise to a downward bias. The net effect in 1971 was that CIP net output of the industrial sector exceeded the contribution of that sector to GDP at factor cost. It will be apparent that the CIP figures for employment will be downward-biased estimates of actual employment. It will be assumed that the net bias in estimating labour productivity from the net output and employment figures of the CIP is uniform across the four subsectors. Thus it can be ignored when dealing with intersubsectoral comparisons of labour productivity within Ireland;

*Excluding "Laundry, cleaning and dyeing", which in this paper is defined to belong to the service sector.

when making cross-country comparisons of one subsector at a time, a correction factor will be applied to the Irish data.

5. Appendix 5 sets out values of output per head within the industrial sector, and these were used to produce Tables A and C below. The two columns under Ireland show, respectively, the actual 1971 values and those values corrected by taking the proportions of CIP total output and employment (accounted for by each subsector) and applying these proportions to the 'industry components' of GDP at factor cost and total employment for the year respectively.

TABLE A

Output per head in each subsector, expressed as an index with respect to average industrial output per head as base =100

Sector	Belgium and Luxembourg	Denmark	Britain	Ireland	Northern Ireland
Mining	101·5 } 95·7	} 98·0	} 95·3	138·6 } 105·4	} 97·3
Manufacturing	95·5			103·6	
Utilities	342·7	233·7	214·9	141·9	156·4
Construction	83·1	96·5	100·1	69·6	100·7
Industrial Total	100	100	100	100	100

TABLE B

Subsectoral Employment weights (Percentages)

Sector	Belgium and Luxembourg	Denmark	Britain	Ireland	Northern Ireland
Mining	2·9	0·4	3·7	3·9	1·3
Manufacturing	76·2	72·7	78·9	70·0	75·0
Utilities	2·0	1·7	3·4	5·4	3·4
Construction	18·9	25·2	14·0	20·7	20·3
Total Industry	100	100	100	100	100

6. Table A shows that in each country other than Ireland, labour productivity in mining and manufacturing combined is lower than the sectoral average, this being compensated for by extremely high productivity in the public utilities. In Ireland, labour productivity in building and construction is considerably lower than elsewhere in the sector, and this results in productivity in mining and manufacturing exceeding the sectoral average. Table C brings out the difference in subsectoral productivity between the different countries.

TABLE C*

Indices of subsectoral output per head, taking the Irish value as base =100 in each subsector

Sector	Belgium and Luxembourg	Denmark	Britain	Ireland	Northern Ireland	UK
Mining	114·2 } 141·6	} 161·9	} 96·5	100 } 100	} 92·9	80·1 } 96·4
Manufacturing	143·8			100		97·7
Utilities	376·5	286·6	161·7	100	110·9	160·6
Construction	186·2	241·2	153·5	100	145·6	153·3
Total Industry	155·8	174·0	106·7	100	100·6	106·6

7. Labour productivity in the combined Irish mining and manufacturing subsector was greater than in either its British or Northern counterpart, and the comparison with the Continental countries is less unfavourable to Ireland than for the other two subsectors.

Employment in building and construction was nearly four times the level in electricity, gas and water, and, therefore, in the overall picture, low productivity in the former subsector was more significant than in the latter.

8. In order to examine the pattern of productivity within the manufacturing sector, we turn to the results for different industries published

*The bottom row of Table C corresponds with the second row of Table 3, except that the figures for Great Britain are based on revised data.

in the Census of industrial production. Results from the corresponding UK Census are presented by way of comparison. To enable comparisons to be made, certain industries in the Irish Census had to be combined:—

"Linen and Cotton spinning, weaving and manufacturers" "Jute, canvas, rayon, nylon etc." "Manufacture of made-up textiles except apparel"	Referred to as "Linen and Jute"
"Non electrical Machinery" "Other Vehicles"	Referred to as "machinery and vehicles"
"Malting" "Brewing"	
"Bacon Factories" "Slaughtering" etc. "Miscellaneous food"	Referred to as "Bacon"

9. The number of industries was thus reduced from 45 to 39. The United Kingdom value of output per head in each industry was expressed as a percentage of the Irish value, and the results are set out in Table D. The eight industries in column 1 are those in which Irish output per head was higher; the remaining columns list those industries in which the United Kingdom had the higher value.

10. The comparisons made in Table D are not altogether reliable, because of the differences in the coverage of the two censi. In general, the Irish census excludes establishments in which less than three persons were engaged, while the British census generally covers only

TABLE D

UK output per head expressed as a percentage of Irish output per head, in 39 manufacturing industries.1971

Range	1 100% and under		2 100·1%–110%		3 110·1%–120%	
	Woollen and Worsted	76·6	Leather goods	100·9	Women's and girls' Clothing	111·2
	Miscellaneous Manufacturing	77·8	Margarine	101·7	Wood and Cork	111·2
	Malting and Brewing	86·8	Creamery products	102·4	Motor vehicles	112·6
	Fellmongering and Tunning	87·2	Shipbuilding	103·9	Electrical Machinery	114·3
	Hosiery	95·7	Shirtmaking	105·2	Men's and Boys' Clothing,	115·7
	Mineral waters	96·4	Bread, Biscuits	107·9	Linen and Jute	115·8
	Chemicals and drugs	98·4	Metal Trades	109·6	Boots and Shoes	119·3
	Sugar refining	97·9			Machinery and vehicles	

TABLE D *continued*

UK output per head expressed as a percentage of Irish output per head, in 39 manufacturing industries. 1971

Range	4 120·1%–130%		5 130·1%–170%		6 over 170%	
	Bacon etc.	121·2	Cocoa etc.	130·2	Soap, Detergents	235·3
	Glass and Pottery	121·8	Railway Equipment	134·3		
	Paper	122·4	Tobacco	140·2		
	Printing, Publishing	125·2	Cement	142·6		
	Miscellaneous	127·4	Canning	143·2		
	Clothing		Furniture	162·7		
	Fertilisers	129·6	Oils paints	162·8		
			Grain etc.	163·6		
			Distilling	169·4		

establishments employing twenty five or more; establishments employing eleven or more are included where these made an important contribution to output. These included "Mineral Waters", some industries in the "Metal goods", "Linen and Jute", and "Miscellaneous clothing" categories, "Brushes and Brooms" (included here with furniture), and some components of "Miscellaneous Manufacturing".

11. The greater coverage given to small firms in the Irish census may be expected to bias measured output per head downwards in comparison with the United Kingdom.

12. Average labour productivity for the manufacturing sector was £2542.6 in the UK, which was 7·9% greater than the Irish figure of £2356. This is at odds with the difference of 2·3% in the opposite direction. Firstly, as mentioned above, CIP productivity figures refer only to the firms covered, and may be biased estimates of the economy-wide values. Second, the bias in CIP sectoral productivity as an estimate of total sectoral productivity may not apply uniformly across the four subsectors. In this case the adjusted figures for Ireland upon which Table C is based would be incorrect.

13. An alternative presentation of the Irish and British productivity in each industry is given in Table E. For each country, output per head in each industry is expressed as an index with respect to average output per head in the manufacturing subsector as base=100, and the industries are ranked in order of productivity, starting with the highest.

TABLE E

Output per head in each industry, expressed as index with respect to sectoral output per head as base =100

Ireland

Industry	Index of output/head	Employment weight, %
Malting and Brewing	226·3	2·7
Distilling	211·5	0·2
Tobacco	195·5	1·2
Chemicals and drugs	188·7	1·9
Margarine	172·6	0·2
Fertilisers	161·7	1·2
Sugar Refining	156·2	1·0
Mineral Waters	151·5	1·0
Oils and Paints	145·0	0·7
Miscellaneous*	142·1	6·0
Creamery products	137·1	3·7
Fellmongering*	121·8	0·8
Grain, etc.	113·9	2·5
Bacon, etc.	104·4	5·3
Total Manufacturing	100·0	100·0
Soap, Detergents*	98·1	0·4
Cement*	97·6	3·2
Printing, Publishing	97·4	5·6
Machinery and Vehicles	93·2	2·4
Wood and Cork	91·9	1·9
Metal Trades	89·3	6·3
Woollen and Worsted*	88·3	3·6
Electrical Machinery	87·0	5·0
Paper	85·8	2·9
Motor Vehicles*	84·6	3·9
Glass and Pottery	81·7	2·1
Canning	81·1	1·9
Linen and Jute	78·4	4·2
Cocoa*	77·7	2·4
Bread and Biscuits	77·0	4·9
Shipbuilding	76·8	0·9
Hosiery	75·4	4·6
Boots and Shoes	63·5	2·8
Furniture*	62·3	2·1
Leather etc.	58·1	0·4
Railway Equipment	56·7	1·2
Women's and girls' clothes	54·5	4·4
Men's and boys' clothes	48·3	2·6
Shirtmaking	46·5	1·4
Miscellaneous clothing	44·9	0·5

United Kingdom

Industry	Index of output/head	Employment weight %
Distilling	332·0	0·3
Tobacco	253·9	0·5
Oils and paints	218·7	0·9
Soap, detergents*	214·0	0·3
Fertilisers	194·2	0·3
Malting and Brewing	182·0	1·0
Grain, etc.	172·6	0·7
Chemicals and drugs	172·0	4·0
Margarine and Butter	162·7	0·2
Sugar Refining	143·1	0·2
Mineral Waters	135·3	0·4
Creamery products	130·0	0·8
Cement*	129·0	2·3
Bacon, etc.	115·5	1·8
Printing and Publishing	113·0	4·6
Canning	107·6	0·8
Total Manufacturing	100·0	100·0
Machinery and Vehicles	99·3	15·2
Fellmongering*	98·4	0·3
Paper	97·3	3·0

Industry	Index of output/head	Employment weight %
Wood and Cork	94·7	1·6
Furniture*	93·9	1·9
Cocoa*	93·7	1·0
Miscellaneous*	93·4	14·2
Glass and Pottery	92·3	1·6
Electrical Machinery	92·1	9·6
Metal Trades	90·7	7·1
Motor Vehicles*	88·2	6·8
Linen and Jute	84·1	4·6
Bread and Biscuits	77·0	2·4
Shipbuilding	74·0	2·3
Railway Equipment	70·6	0·6
Boots and Shoes	70·2	1·1
Hosiery	66·9	1·6
Woollen and Worsted*	62·7	1·4
Women's and girls' Clothes	56·1	0·6
Leather, etc.	54·3	0·2
Miscellaneous Clothing	53·1	2·0
Men's and boys' Clothes	51·8	1·2
Shirtmaking	45·3	0·6

14. In both countries, manufacturing employment was biased towards industries with a lower productivity than the average for the country's manufacturing sector. In Ireland, 25 industries accounting for 71·6% of manufacturing employment had less than average productivity. The bias was greater in the UK where the corresponding figures were 23 industries accounting for 80·9% of manufacturing employment. The ordering of industries according to productivity is not identical for the two countries, but broadly speaking, each industry appears in the same part of the list in either country. Making an arbitrary division of the manufacturing sector in each country into thirteen high productivity industries, thirteen medium, and thirteen low (see dotted

lines in Table E) we find that the high groups have eleven industries in common, the medium nine and the low eleven.*

The high productivity industries include drink and tobacco, chemicals (including fertilisers, paints etc) and high technology food processing. The medium productivity industries include much of the engineering industry, paper, printing and publishing and certain others such as wood and cork, glass and pottery. The low productivity industries are principally clothing and textiles, baking, shipbuilding and railway equipment.

15. Chart A depicts the relationship between productivity in Ireland and in the UK as a bar chart. The bars are arranged in the order of productivity in Ireland.

16. It has previously been mentioned that the bias in employment towards low productivity industries is greater in the UK. Comparisons of labour productivity between similar industries tells us only half of the story: to complete it we must take account of the relative importance of that industry in manufacturing employment in each country.

17. The concept of the "rth order partial productivity" is introduced here. This is defined as the average productivity of their most productive industries. Having ranked the industries as in Table C, the value of total net output and of total employment of the first industries are taken for, say, Ireland, and the latter is divided into the former. Thus for Ireland the first partial productivity is simply the productivity of the malting and brewing industry, the second is the average for malting and brewing and distilling combined, and so on, until the thirty-ninth step, which is the average for the whole sector.

18. These values have been completed for Ireland and for the UK for 1971 and the results are presented in graphical form in Chart B plotted against percentage employment.** By way of example, consider

*Industries belonging to a different group in each country are marked with an asterisk.

**They are also presented in tabular form in Appendix 6.

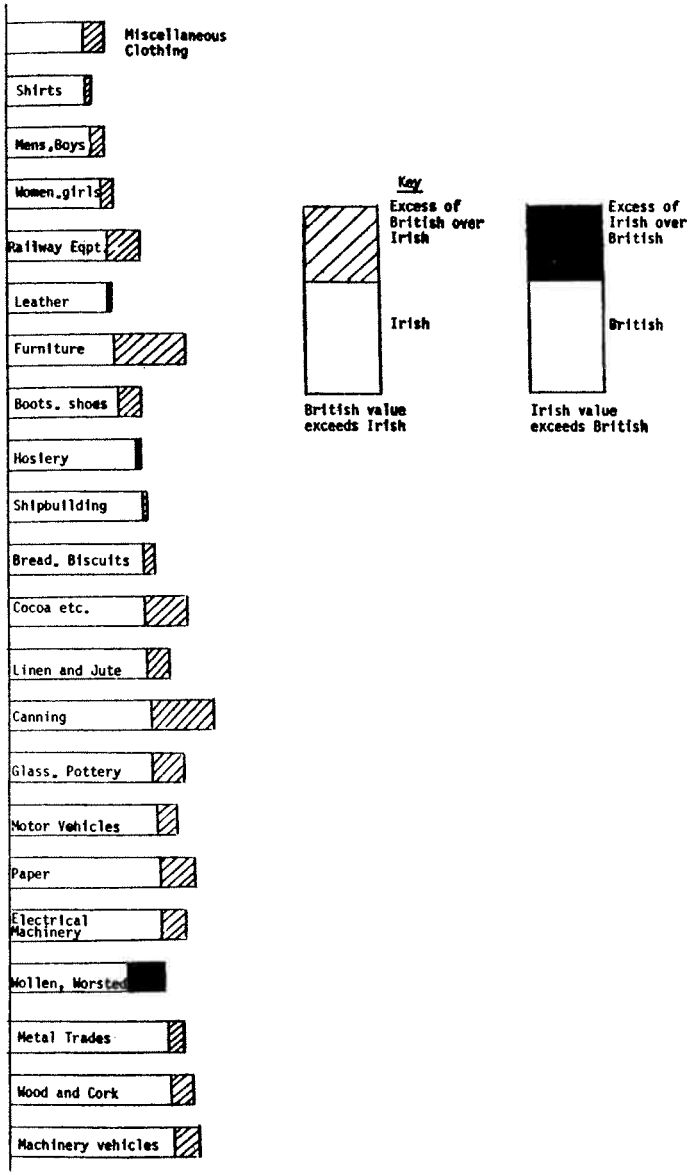
point A on the Irish curve. Its co-ordinates are (40,3209). This means that the average productivity of the most productive 40% of the Irish manufacturing workforce is £3209.

19. Below 19%, the UK curve lies above the Irish: that is, average productivity of the most productive 19% of Irish workers* is lower than that of the corresponding 19% of UK workers. Between 19% and 55% the Irish curve is the higher, and above 55% it is lower. The phenomenon of the Irish curve lying above the British in the middle range is due to the greater bias in British employment towards low productivity industries. It suggests that to raise average Irish productivity in manufacturing to the British level, the problem would be not so much to switch to industries with very high productivity as to raise the productivity of, say, the 50% of workers with the lowest output per head towards the level already achieved by the most productive of this 50%.

*In the context "workers" and "employment" are to be understood as referring to the manufacturing sector.

CHART A

Bar chart showing Irish and British output per head in thirty-nine manufacturing industries.



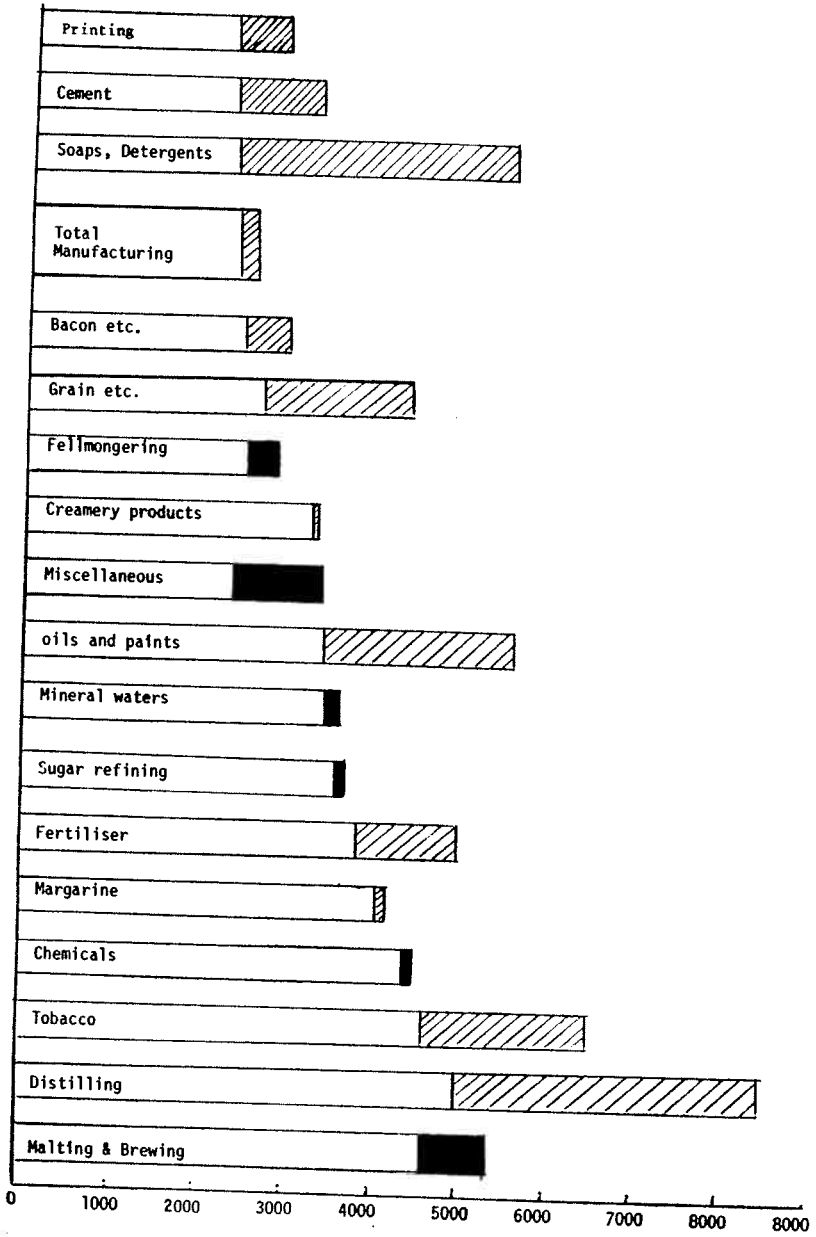
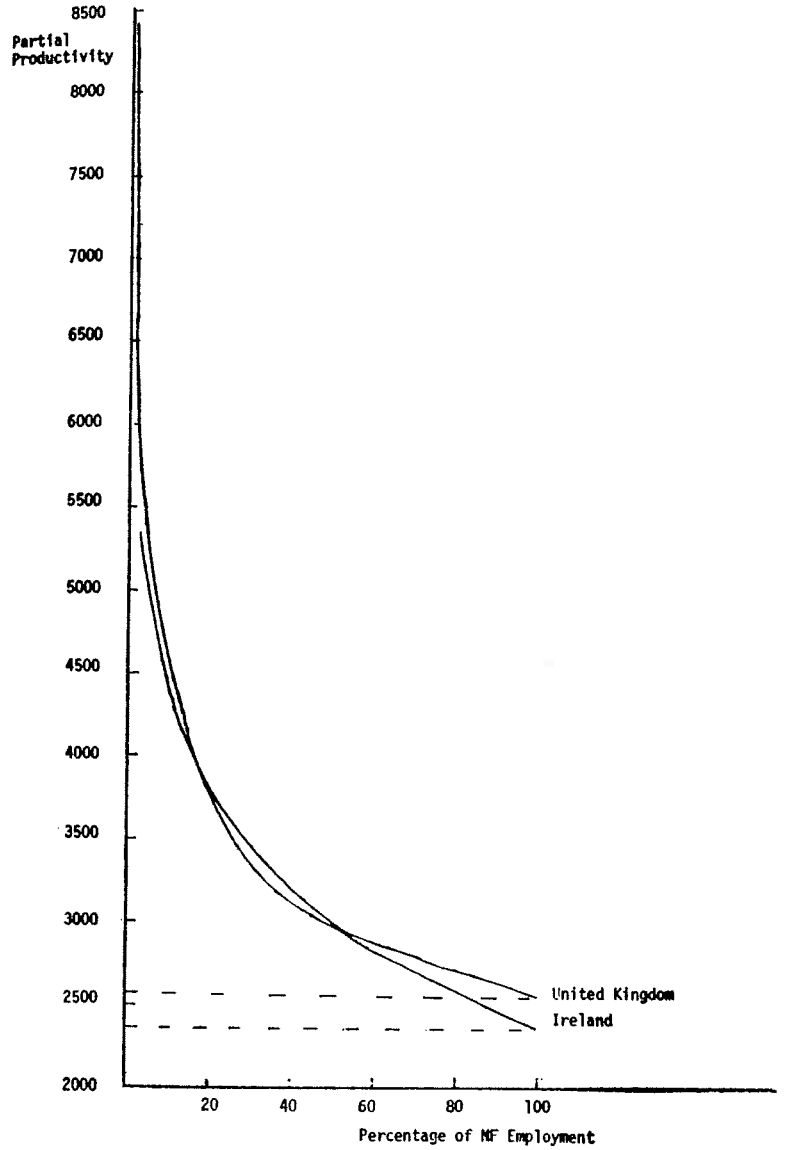


CHART B

Graphs of partial productivity against the corresponding proportion of manufacturing employment, 1971.

The broken lines show the Irish and UK levels of average productivity in manufacturing industry in 1971.



20. Using the ranking of Table E, the most productive 19% of Irish manufacturing employees work in the industries from "Malting and Brewing" up to "Miscellaneous Manufacturing" while the first 55% extends to "Woollens and Worsted". In both the UK and Ireland the remaining 45% is accounted for by most of clothing and textiles, the motor industry, bread and biscuits, leather goods, footwear, and electrical machinery. Certain other industries are included in one country and not in the other.

21. In treating labour productivity in isolation, the importance of capital must not be lost sight of. Suppose that the various measurements of labour productivity in Ireland and elsewhere are accurate and produce figures for the different countries which may meaningfully be compared with one another. In the manufacturing sector and in most individual industries, the Irish value is lower than that of the UK. Assuming that a rise in labour productivity in the manufacturing sector is desirable, certain possibilities arise.

22. Firstly it might be argued that in some industries, lower Irish productivity was not a cause for concern because the level of capital intensity in Ireland in each of these industries was lower than in the UK. This argument would not be satisfactory because, broadly speaking, the similarity of relative factor prices in the two countries implies an identity of the optimal choice of techniques in the two countries for a given industry. Disparity in labour productivity implies one of two things. Firstly it may be that less advanced technology is in use in this country; it should be noted that a less advanced technology which was labour intensive relative to the UK could not be justified on the ground of "providing employment". Ireland has a small and open economy, and cannot disregard the necessity of maintaining and improving her competitive position with respect to the world in general and the rest of the EEC in particular. Alternatively it may be that, while Irish and UK technology in a given industry are similar, less efficient use is made of Irish capacity.

23. The second approach might be that some manufacturing industries, efficient though they may be on their own terms, are inherently relatively less productive than the rest of the sector. There, the

argument might run, men and capital are under-employed when they could be better employed elsewhere. Market forces will tend to channel new investment away from such industries if any exist which are indeed irredeemable. However, it is much more likely that in fact we are approaching the choice of techniques problem once again: firms in such industries will be presented with the alternatives of modernising, or of closing and being replaced by other firms utilising more modern techniques.

APPENDIX 5

Output of industrial sector by four main subsectors, 1971, £m

Sector	Belgium and Luxembourg	Denmark	Ireland	United Kingdom	Northern Ireland	Great Britain
Mining	141·04	1,893·375	34·222	786	308	15,952
Manufacturing	3,457·50		462·872	15,474		
Utilities	317·34	106·590	49·361	1,501	22	1,479
Construction	747·34	642·675	91·607	2,924	85	2,839
Industry	4,753·22	2,642·64	637·962	20,885	415	20,270

Employment of industrial sector by four main subsectors, millions

Sector	Belgium and Luxembourg	Denmark	Ireland	United Kingdom	Northern Ireland	Great Britain
Mining	0·061	0·003	0·011	0·405	0·003	8·979
Manufacturing	1·329	0·632	0·196	8·754	0·177	
Utilities	0·034	0·015	0·015	0·377	0·008	0·369
Construction	0·330	0·219	0·058	1·568	0·048	1·520
Industry	1·745	0·869	0·280	11·104	0·236	10·868

Note: No 1971 figures are available for subsectoral employment in Denmark. The division of the total was assumed to be the same as in 1972, for which year figures are available.

Output per head by four main industrial subsectors, 1971, £

Sector	Belgium and Luxembourg	Denmark	Ireland		United Kingdom	Northern Ireland	Great Britain
			adjusted	un-adjusted			
Mining	2,765·5	2981.7	2,422·3	3,154	1,940·7	1,711·1	1,776·6
Manufacturing	2,601·6		1,809·4	2,356	1,767·6		
Utilities	9,333·5	7,106·0	2,479·1	3,228	3,981·4	2,750·0	4,008·1
Construction	2,264·7	2,934·6	1,216·5	1,584	1,864·8	1,770·8	1,867·8
Industry	2,723·9	3,041·0	1,748·0	2,275	1,862·8	1,758·5	1,865·1

Sources: Output Statistics:
Denmark, Belgium: *Annual Surveys*, OECD, *1973.*
Ireland: *Census of Industrial Production, 1971.*
United Kingdom: *National Income and Expenditure, 1972.*
Northern Ireland: *Northern Ireland Economic Report, 1972.*

Employment Statistics:—
Denmark, Belgium, UK: *Labour Force Statistics 1960–1971*, OECD, 1973
Ireland: *Census of Industrial Production, 1971*
Northern Ireland: *Northern Ireland Economic Report, 1972*

APPENDIX 6
Ireland

Industry	Partial Productivity	Cumulative Employment %
Malting and Brewing	5,331·6	2·7
Distilling	5,311·0	2·9
Tobacco	5,108·5	4·1
Chemicals and Drugs	4,896·5	6·0
Margarine	4,867·3	6·2
Fertilisers	4,710·9	7·4
Sugar Refining	4,591·9	8·4
Mineral Waters	4,470·6	9·4
Oils and Paints	4,409·0	10·1
Miscellaneous	4,013·2	16·1
Creamery Products	3,866·1	19·8
Fellmongering	3,828·7	20·6
Grain etc.	3,705·4	23·1
Bacon etc.	3,466·1	28·4
Soap, Detergents	3,450·9	28·8
Cement	3,448·6	32·0
Printing, Publishing	3 274·8	37·6
Machinery and Vehicles	3,209·4	40·0
Wood and Cork	3,160·9	41·9
Metal Trades	3,022·0	48·2
Woollen and Worsted	2,956·1	51·8
Electrical Machinery	2,876·4	56·8
Paper	2,834·5	59·7
Motor Vehicles	2,783·0	63·6
Glass, Pottery	2,755·6	65·7
Canning	2,731·3	67·6
Linen and Jute	2,679·7	71·8
Cocoa	2,652·0	74·2
Bread and Biscuits	2,599·8	79·1
Shipbuilding	2,591·0	80·0
Hosiery	2,547·0	84·6
Boots and Shoes	2,513·8	87·4
Furniture	2,489·5	89·5
Leather etc.	2,484·4	89·9
Railway Equipment	2,469·8	91·1
Women's and Girls' Clothes	2,415·6	95·5
Men's and Boys' Clothes	2,381·6	98·1
Shirtmaking	2,363·0	99·5
Miscellaneous Clothing	2,356·0	100·0

United Kingdom

Industry	Partial Productivity	Cumulative Employment %
Distilling	8,443·5	0·3
Tobacco	7,176·4	0·8
Oils and Paints	6,350·0	1·7
Soap, Detergents	6,230·5	2·0
Fertilisers	6,064·0	2·3
Malting, Brewing	5,653·9	3·3
Grain etc.	5,430·2	4·0
Chemicals, Drugs	4,889·3	8·0
Cement	4,386·7	11·9
Margarine	4,875·0	8·2
Sugar Refining	4,849·7	8·4
Mineral Waters	4,791·3	8·8
Creamery Products	4,658·9	9·6
Bacon etc.	4,194·4	13·7
Printing, Publishing	3,858·6	18·3
Canning	3,812·0	19·1
Machinery and Vehicles	3,238·7	34·3
Fellmongering	3,232·9	34·6
Paper	3,171·0	37·6
Wood and Cork	3,139·5	39·2
Furniture	3,105·2	41·1
Cocoa	3,088·6	42·1
Miscellaneous	2,907·6	56·3
Glass and Pottery	2,892·1	57·9
Electrical Machinery	2,813·5	67·5
Metal Trades	2,765·3	74·6
Motor Vehicles	2,721·4	81·4
Linen and Jute	2,689·8	86·0
Bread and Biscuits	2,669·7	88·4
Shipbuilding	2,649·3	90·7
Railway Equipment	2,643·9	91·3
Boots and Shoes	2,633·4	92·4
Hosiery	2,617·9	94·0
Woollen and Worsted	2,602·4	95·4
Women's and Girls' Clothes	2,595·0	96·0
Leather etc.	2,592·0	96·2
Miscellaneous Clothing	2,566·5	98·2
Men's and Boys' Clothes	2,550·8	99·4
Shirtmaking	2,542·0	100·0

Basic Sources:

Ireland: *Census of Industrial Production 1971: Irish Statistical Bulletins* March 1974.

United Kingdom: *Report on the Census of Production 1971. Provisional Results,* HMSO.

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