

POPULATION AND ECONOMICS IN IRELAND IN THE RECENT PAST
AND IN THE NEAR FUTURE*

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Introduction

There is far more to population than economics. The existence of any person now is the result of one chance in countless billions of possibilities down the ages so, by this test, the value of a person is immeasurably great whatever her or his social status, though this may not appear about ourselves or to us about our fellow humans, there are so many of us. The existence of a person will usually create love and other social relations of incomparable significance. We are aware that in law and in less worthy connections (including kidnapping) the question of valuation of a person can arise; figures are mentioned but they cannot be regarded seriously as statistics. At one time in Ireland* long ago the argument was rife in respectable circles that because it cost £1,000 to rear an emigrant the country lost £20 million a year if emigration amounted to 20,000 persons. R. C. Geary's (1941) refutation of this thesis is nowadays as likely to amuse as to instruct. You may hold that human existence is always better than non-existence, a philosophical question which shall not concern us.

Our approach is almost exclusively statistical. We bear in mind, however, the peroration of Séan Lemass at the Centenary Banquet in 1947 of the SSISI. "The best things in life are not measurable by statistics and we pray that they will remain so". We mention non-statistical values lest they be forgotten. Population policy may be determined by such values, despite any statistical showing; this is for the people to determine. There may be no such conflict.

During the past 200 years the Irish diaspora has almost equalled that of the Jews, our population level dominated by emigration which has had the

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important abiding result of a population of Irish origin throughout the world immensely greater than the home population: a European monk, Strabo, in the 9th century referred to "the Irish habit of going away" (Waddell, 1933). If this "going away" be an ingrained instinct of the people we must be slow to condemn it out of hand as always "bad", as was usually the case in the past, but rather to determine what the national outlook should be in future, given the relevant conditions at home and abroad. B. M. Walsh (1968) has shown that variations in the movement in the period 1952-68 were dominated by relative economic conditions (comparative unemployment and wage levels) in Ireland and UK.* An open mind will be necessary about the problem of migration, in as well as out. The virtual cessation of net emigration since 1961 is to be welcomed as a very positive indication of the strength of the economic upsurge that started about 1960 and as showing our young people's realisation that a good livelihood can be had in Ireland.

By international comparison there was nothing very remarkable about the Irish birth and death rates during the past 150 years. Before 1960, however, the Irish marriage rate was very low and but slowly increasing. A tenable hypothesis would be that the low marriage rate was partly related to the economic level and the propensity to emigrate, i. e., as indicating unsettlement amongst young people as to where their future would lie, marriage implying employment, a settling down.

With a normal birth rate and low marriage rate in the past, births per marriage in Ireland during most of the past century were very high by comparison with other countries in western Europe. There were also the facts that in these countries (including Ireland) (i) number of births was always well below the biological maximum and (ii) the number of births was always of the same order of magnitude as the number of deaths, despite the fact of a birth and a death being almost independent.

* See Keenan (1981) for a detailed discussion of this and the subsequent literature on the determinants of migration.

of one another*. Does each community in some sense require a more or less determinate number of births, as a law of population? R. C. Geary (1935) found that (i) with countries as units there was an inverse relationship between the marriage rate and the birth rate and (ii) with Irish counties as units a similar result. These relationships were found using data of half a century ago and we are not concerned with their being true today or then, except to remark that they do not disprove a law of something like self-regulation in the matter of population. A question arises "Is there any point in policy?" For example, if family planning reduces children per marriage from four (imaginary) to two will number of marriages double, and, if so, what point is there in trying to regulate population size in a democratic society? **

One cites a paper of 1935 with some trepidation nowadays - another popular myth of the time that it dispelled was that "the bullock drove the people from the land" - but listen:-

"It would be an inestimable advantage if population could be forecast even within wide limits of error. These forecasts are really implicit in all long-term fixed capital investment, including building of all kinds (universities, schools, factories, shops, as well as private dwelling schemes); investment in industrial and commercial enterprises; construction of roads and drainage works, etc. For the purpose of public administration these figures would be most useful, for example in connection with the provision to be made for old age and other public pension schemes. The extent to which government would be justified in embarking on long-term investment (perhaps with the intention of relieving present-day distress), or "mortgaging the future" as the saying goes, must depend to a considerable extent on the anticipated size of the population.

Mention of schools and old age pensions brings to mind the necessity of forecasting not only total population but also its break-up into age groups and sexes, which has also an important bearing on the problem of estimating the future earning power of the population as indicated say by the proportion of males between the ages of 15 and 65 and the burden of dependency as indicated by the proportion of population outside of these ages".

Not bad at all as a prescription for the present paper!

* In fact connected only by large birth rates being related to high infant mortality.

** The UN Fourth Inquiry among Governments in developed countries as to their perceptions of the consequences of current rates of natural increase indicated that of 40 countries surveyed 11 felt that a higher rate was desirable, 28 were satisfied with the current rate and only one (Turkey) felt that a lower rate was desirable, and that of the 11 countries that desired a higher rate of natural increase, 7 pursued policies that sought to increase fertility. UN (1979)

In our preliminary study of authority we found elaborate analysis of dubious statistical data and subtle theoretical reasoning bearing on our topic, most resulting (when there was a result) in conclusions which could be derived by good sense or common knowledge. For example, the simple answer, requiring no analysis, to Malthus' so well known theory of destruction is that it didn't happen; necessarily it was that prophet's misfortune that far wiser thought of his was ignored, to the detriment of demographic—economic theory, resulting from Ricardo's taking over. Even nowadays, however, there may be some truth in Malthus as applied to poorer countries.

We shall be concerned with the three great age groups, 0-14, 15-64, 65+, i. e., children, working, retired, approximately, the middle group supporting the other two, meaning that the output of the middle group must be enough not only for themselves but for the other two groups as well; of course they must support their own ill and unemployed. This is the problem of dependency, the ratio of sum of first and third to the second being very high in Ireland, as we shall see. While, as already remarked, number of births is of the same order of magnitude as number of deaths, the former always exceeds the latter in Ireland (as in most modern communities), the excess being the natural increase; when the latter exceeds net emigration the population increases.

The outstanding fact of humanity is that, despite the lack of explicit relationship between births, deaths and effort to obtain the wherewithal for life, in every age the majority of people have succeeded in obtaining a living if not at a generally high level and that, in the more advanced countries, i. e., those for which it has been possible to make reliable estimates, the material standard of living has markedly increased as well as the population itself, as we shall see: so much for Malthus in these countries! Well may religious people exclaim from the showing of Table 3 "The Lord above will provide".

We shall first consider the main features of the recent demographic and economic trends in Ireland, on occasion with recourse to international comparison. The demographic treatment will culminate in estimates of the population in the future census years 1991 and 2001. We shall regard our main object in examining trends in the recent past as enabling extrapolations of populations in education, agriculture, industry, services as well as likely trends in number of marriages. In aggregate these extrapolations (probably with implicit large recourse to ranges of figures) will be compared with the aforementioned estimates of population in A.D. 1991 and 2001. Differences between the former (aggregates) and the latter (estimates) must be accounted for by migration and/or unemployment. This approach will also permit an examination of the few forecasts made by others. We would hope that our investigation generally would help towards the formulation of a middle-term socio-economic plan for Ireland, with an eye to the constraint, mostly financial, on progress.

Scepticism has often been expressed about the usefulness of planning and forecasting, in view of the uncertainty.^{*} It is quite true that great unforeseeable changes are certain to occur in the twenty years to our time horizon. We are always prone to think that no times ever changed so rapidly as ours at present. Despite these changes there has always been a great stability in the Irish macros - see, for instance, the small changes over long time periods in most of the series in Table A1. Good plans can be made from quite rough forecasts; with determination and wide acceptance by the public the plans will be largely self-fulfilling. At its lowest, exercises like the present force us to think about the future, surely a good in itself.

International comparison of population

With no further preamble we plunge in medias res with Table 1, of recent comparable European statistics.

Table 1

* However, see Norton (1975) for a full discussion of planning and policy formation and the technical constraints inherent therein.

There is no need to stress the sensational character of this table. Ireland's birthrate was largest in 1975, the only rate that had not declined since 1960, though a small fall has been recorded in the net reproduction rate (NRR): this is the number of females who will survive to reproduce, per female infant born now. The poorer countries on the roster are those with the higher birth rates, and NRRs and the declines have been the more rapid generally in the fifteen year period the wealthier the country. Most remarkable is the case of the German Federal Republic, the rates for which have nearly halved. Even France, which for more than a century has been the most vigorous propagandist for les familles nombreuses, has not been able to maintain its rates.

Table 2

No details are given in the source of Table 2 as to the methods used for forecasting populations. They are stated to be from official sources; also "where several projections based on different assumptions are available that in which the assumptions come most closely to current trends has been taken". We are not surprised to notice smaller anticipated increases for the more prosperous countries, which are likely to remain the more prosperous. The expected trends in the populations aged 15-44 are given for the relevance of these to inter-European migration. Ireland is not represented in Table 2 but it may be stated that from data to be discussed the anticipated percentage increases (assuming migration nil and birth rate 21) during the twenty-five year period 1975-2000 will be about 32 for the whole population and 53 for the population aged 15-44. These percentages are much higher than any in the last column of Table 2. In recent years Ireland has experienced net immigration so that an assumption of net migration nil in the near future is by no means implausible.

Assuming that integration of Europe continues during the next twenty years(not merely formally but in reality) there must be an increasing tendency to migrate towards more prosperous centres and, to repeat, we expect the present

more prosperous countries to remain so, relatively. There will be no objection to entry for jobs provided there are vacancies but, in the recent past in the more affluent countries, entry was to inferior jobs that natives did not want and such limitation in future will appeal less and less to fellow-Europeans, least of all to the Irish, with an almost unequalled experience of emigration, the worst feature of which was lack of skill of emigrants. The latter forced Irish immigrants into the lowest and poorest paid jobs in the principal countries of immigration, USA and Britain. Status inferiority lasted even into the second generation of Irish in USA. Irish emigration to USA has been small since the depression of the 1930s and indications now are that people of Irish origin are fully integrated jobwise in the USA. The main lesson from the past is that in future most Irish people seeking work abroad should have acquired a skill before they go. With a trade or a profession there should be little difference in employment anywhere for anyone, with improved ease of travel and communication the distinction between voluntary and compulsory emigration vanishing as we become more consciously and acceptably citizens of Europe. We must also become receptive towards other Europeans coming to jobs in Ireland.

The normal condition for Ireland during the past two centuries was of high unemployment and emigration rates. Population in the past never adjusted itself to these conditions. For most of the time the indications were of national over-population, though the population was small in relation to the area of the country, by European standards. The situation as regards emigration, however, was probably never as tragic as it was politically represented to be; it was true, as indeed one politician got into trouble for so expressing it even after independence, "emigration is part of the Irish system", so much so, indeed, that as recently as twenty-five years ago three out of five youngsters aged 14 emigrated and probably all children considered emigration as a possibility some time. It was more natural for children in rural areas to go to a job in Liverpool (later, as to Boston earlier) where they had friends and relations than to go to Dublin. Yes, emigration was

Table 1: Birth and net reproduction rates in certain European countries, 1960 to 1975

Country	1960	1965	1970	1975	1960	1965	1970	1975
	Birth rate				Net reproduction rate			
Austria	17.9	17.9	15.2	12.5	1.19	1.24	1.07	0.91
Belgium	17.0	16.5	14.8	12.2	1.19	1.22	1.06	0.87
Denmark	16.6	18.0	14.4	14.2	1.20	1.23	0.93	0.92
France	17.9	17.8	16.8	14.1	1.28	1.34	1.18	0.92
Germany, F.R.	17.4	17.7	13.4	9.7	1.10	1.18	0.95	0.68
Greece	18.9	17.7	16.5	15.7	1.00	1.05	1.12	1.07
Ireland	21.5	22.1	21.9	21.5	1.80	1.85	1.81	1.67
Italy	17.9	18.8	16.5	14.8	1.07	1.21	1.11	1.02
Netherlands	20.8	19.9	18.3	13.0	1.46	1.43	1.22	0.79
Norway	17.3	17.8	16.6	14.1	1.33	1.37	1.19	0.95
Portugal	23.7	23.0	19.1	19.1	1.40	1.38	1.39	1.27
Spain	21.6	21.1	19.5	18.9	1.24	1.35	1.35	n.a.
Sweden	13.7	15.9	13.7	12.7	1.02	1.15	0.92	0.85
Switzerland	17.6	18.8	15.8	12.3	1.15	1.23	1.00	0.76
United Kingdom	17.5	18.4	16.3	12.5	1.26	1.35	1.15	0.85

Source: Council of Europe. Recent demographic developments in the member states of the Council of Europe, Strasbourg 1978

Note:

The 1975 rates shown for Ireland are slightly higher than those shown in Table A1 due to upward revision of the 1978 Population estimate after the 1979 Census.

Table 2: Projections of population to year 2000 in certain European countries, total and ages 15-44

Millions

Country	1975	1980	1985	1990	1995	2000	1975/2000 % Change
Total Population							
Belgium	9.79	9.83	9.84	9.89	9.94	9.97	1.8
Denmark	5.05	5.12	5.19	5.24	5.29	5.31	5.1
France	52.60	53.60	54.83	56.09	57.26	58.24	10.7
Germany, F.R.	61.99	60.76	59.61	58.59	57.47	55.94	-9.8
Greece	8.99	9.25	9.48	9.70	9.92	10.15	12.9
Italy	55.65	56.34	57.08	57.83		n.a.	5.9*
Netherlands	13.60	13.90	14.25	14.65	14.99	15.22	11.9
Portugal	9.63	9.97	10.27	10.52		n.a.	13.1*
Spain	35.34	37.26	39.05	40.64	41.95	n.a.	23.0*
United Kingdom	55.98	55.90	56.16	56.84	57.57	58.00	3.6
Population aged 15-44							
Belgium	4.03	4.21	4.34	4.45	4.32	4.17	3.5
Denmark	2.11	2.21	2.31	2.31	2.22	2.18	3.3
France	22.06	22.91	23.89	24.96	24.45	24.26	10.0
Germany, F.R.	26.09	26.79	26.58	25.33	24.34	23.15	-11.3
Greece	3.72	3.76	3.89	4.06	4.12	4.15	11.6
Italy	23.07	23.47	24.08	24.67		n.a.	10.3*
Netherlands	5.96	6.39	6.76	6.87	6.57	6.41	7.6
Portugal	4.02	4.25	4.46	4.68		n.a.	25.6*
Spain	14.65	15.38	16.46	17.43	18.22	n.a.	30.0*
United Kingdom	22.06	23.36	24.43	24.75	23.87	23.86	8.2

* estimated

Source: Eurostat. Statistical office of the European Communities, 1980.

largely an accepted practice in Ireland. It cannot, and should not, be ruled out in future, under certain conditions.

We assume that our freedom implies that the interest of the individual in Ireland will be paramount, as distinct from any claim of State or even of family. Of course there are constraints on her or his liberty but, within these constraints or in spite of them, the judgment of the individual about his or her interest will be final, as to choice of place of work. The relevance of the foregoing remarks is that (at this introductory stage) we cannot envisage maintenance of the Irish birth rate at more or less present levels without fairly substantial emigration. This hypothesis will be examined later. Well-prepared young people working anywhere may become a valuable asset of the nation.

To repeat what we said earlier, the outstanding fact of the human condition is that, despite the lack of relationship between births and deaths, and effort to obtain a livelihood, in every age the majority of people have succeeded in obtaining a living. In the more advanced countries, which naturally happen to be those for which actual figures or estimates of population and income over a long period in the past are available - see Table 3 due to Simon Kuznets - the material standard of living has markedly increased as well as the population itself. While in these countries learning (and all that this implies) has manifestly defeated his prophesy of doom, Malthus's theory will continue to rule in a large part of the world (in which it is estimated there are one billion people, or one quarter of the world population, hungry) unless and until the more affluent parts (including Ireland) substantially improve on their present wretched levels of aid.

Table 3

The comparable figures for Ireland in the lengthy periods shown in Table 3 are not available. From our appendix Table A1, giving basic data for the post-war period the following calculations have been made:-

Table 3: Population growth and output growth per head over (1) a century and (2) a half century

Country	Period	Population growth rate per decade	Output per head growth rate per decade
(1) Century			
France	1861-70 to 1963-66	3.0	17.0
Sweden	1861-69 to 1963-67	6.6	28.9
Great Britain	1855-64 to 1963-67	8.2	13.4
Norway	1865-69 to 1963-67	8.3	21.3
Denmark	1865-69 to 1963-67	10.2	20.2
Germany	1850-59 to 1963-67	10.8	18.3
Japan	1874-79 to 1963-67	12.1	32.3
Netherlands	1860-70 to 1963-67	13.4	12.6
United States	1859 to 1963-67	18.7	17.3
Canada	1870-74 to 1963-67	19.0	18.7
Australia	1861-69 to 1963-67	23.7	10.2
(2) Half Century			
France	1896 to 1963-66	3.5	18.6
Great Britain	1920-24 to 1963-67	4.8	16.9
Belgium	1900-04 to 1963-67	5.3	14.3
Italy	1895-99 to 1963-67	6.9	22.9
Switzerland	1910 to 1963-67	10.4	20.5
Netherlands	1900-09 to 1963-67	14.2	15.1
United States	1910-14 to 1963-67	14.2	18.4
Australia	1900-04 to 1963-67	18.8	13.1
Canada	1920-24 to 1963-67	19.4	20.9

Source: Simon (1977) in which it is stated the data derive from S. Kuznets' Economic growth of nations, Harvard University Press, 1971.

Percentage changes per decade in population and real GNP per head in Ireland
1947-1960 and 1960-1978

	1947-1960	1960-1978
Population	-3.8	9.1
GNP per head	28.1	33.8

A remarkable feature of Table 3 is the comparative constancy in growth rates in output per head compared to growth rates in population: in the half-century the range in the former was 14-21 while the increase in population range was $3\frac{1}{2}$ - $19\frac{1}{2}$. As regards Ireland, it may come as some surprise that the increase in real GNP per head was not so very different in the two periods before and after 1960, whereas the difference in population changes were enormous - from a decadal fall of 4 per cent to an increase of 9 per cent. We may add that, as is almost self-evident, there is no correlation in either period of Table 3 between population and output per head growth.

Is there a law of population adjustment?

In an almost purely statistical paper like this one must be on one's guard against mystical speculations, impossible of proof. Yet, as suggested earlier, the inference from Table 3 and our Irish addendum is irresistible that in modern communities population adjusts itself in some way to a desired level of material wellbeing or vice versa, if in a mysterious way. If this were fully true there would be little point in considering a policy for population or the economy, and policy implies intervention of government. During the long periods of Table 3 there was but little involvement of government; the same is true of postwar Ireland. France was the only population-conscious country in the past but the result of prodigious effort was negligible and economic plans everywhere have fallen into disrepute, unfortunately so. In our econometric opinion the plans were not good enough.

These mystical speculations might seem to imply that of their own accord populations and economies will adapt to one another automatically. So,

to repeat a question, what is the point of this paper? The answer is: if true, these are average findings with enormous variation in wellbeing and the lot of the disadvantaged will not improve automatically; the gap between rich and poor is widening within countries and between countries; and even a good situation can always be made better by intelligent effort in the light of information.

The tendency towards a constant number of births even with an increased number of marriages referred to earlier may be operating at present in Ireland. Between the census years 1971 and 1979, eight years only, number of married women aged 15-44 increased from 274,000 to 365,000 or by 33 per cent, while births to such women increased from 65,400 to 68,900, or by only 5 per cent, indicating an unprecedented decline in fertility of marriage. Age-specific fertility rates in these two years are shown in Table 4.

Table 4: Births per 100 married women aged 15-44, 1971 and 1979

Age of married women	Fertility rate		Percentage decline
	1971	1979	
Under 20	68.2	54.3	20.4
20-24	45.9	34.3	25.3
25-29	35.1	27.5	21.6
30-34	24.9	19.6	21.4
35-39	16.1	10.8	33.0
40-44	5.9	3.5	39.9
Total	23.9	18.9	21.0

Basic source: Census of Population 1971, 1979; Report on Vital Statistics

The uniformity of decline amongst younger women will be noted. The greater declines in the two older groups are just what would be expected if the thesis of inverse relationship between marriage and fertility rates obtained.

Future Population

Before considering estimates of future population, some remarks on basic Table A1. The rates shown have been revised to take account of the revisions in intercensal population estimates for 1972-1978 consequent on the

census of 1979. The most remarkable features of the table are -

- the change in trend in total population in 1961 from mild decline to emphatic increase;
- the constancy of the birthrate, despite
- the increase in the marriage rate from about 5.5 for many years to 7.4 in each of the years 1971-1973, or by 35 per cent;
- the persistent decline in the crude death rate to less than 10 per thousand in 1979, resulting in an increase in the rate of natural increase from 9.0 in 1946 to 11.8 in 1979;
- the changeover in net migration from substantially out during 1949-1961, to less substantially but persistently in during the years 1972-1979 with an interregnum of mild emigration between these periods;
- the persistent increase in real GNP per head over the whole period and not only since the resurgence of 1960;
- also the persistence of the percentage out of work, apparently unaffected by the economic upsurge.

While the last inference is formally true, it is a fact that the total of unemployment plus emigration (with immigration minus) has improved substantially. The correlation between real GNP per head and the marriage rate is .81 which, with 30 d.f. is highly significant.

Fundamental for our inquiry will be estimates of population for near future census years which we take as 1991 and 2001. It is unnecessary to warn about the hazardous character of these estimates which in the past have been falsified in every country that has tried them. In Table 5 forecasts are based on the assumption of migration nil. They are means to an end, and not an end in themselves, as will appear. They are designed to enable us to discuss levels of labour force, unemployment, migration, education, capital requirements etc.,

in fact economic and social policy, with some approach to reality.

Our method of estimation is simple which, we hope, will not be regarded as naive. Usually for such work demographers take into account marriage rates, fertility rates, birth, death and migration rates, and assume changes in these during the forecasting period. These methods involve several assumptions all likely to prove wrong.* We decided to base our estimates on the fewest possible assumptions. They are most likely to be wrong at ages under 20. For these we assume a narrow range of birth rates, this because despite the great increase in the marriage rate in recent years the birth rate has remained almost constant over the whole postwar period - see Table A1. We assume unchanged death rates at every age in using survivorship rates derived from the 1970-72 Life Table at each quinquennial age group, summarised to four major age groups.

Table 5

The assumption with regard to the birth rate does not make much difference to the total population estimate between 1979 and 2001. Attention is confined to the case of migration zero, so that the estimates for 1991 and 2001 purport to relate to the Irish** wherever they reside. Starting always with the same population, namely, 3.4 million in 1979, with no emigration the figure in 2001 would reach 4.3 million (assuming the continuance of a presentday birth rate of 21).

One of Ireland's gravest demographic problems is its high dependency ratio, namely the ratio of the number of those aged 0-14 and 65 and over to the number aged 15-64. The figure of 0.70 for Ireland in 1979 compares as follows with those for other European countries:-

Austria	0.61	Netherlands	0.55
Belgium	0.56	Norway	0.60
Denmark	0.56	Portugal	0.61
France	0.59	Spain	0.60
Germany, F.R.	0.55	Sweden	0.57
Greece	0.57	Switzerland	0.53
Italy	0.57	United Kingdom	0.59

Basic source: Council of Europe (1978)

* Walsh (1980) warns of "... the tendency of models to be dominated by historical trends and not to anticipate turning points ..."

** i.e., Irish born after 1979 plus survivors of those alive in Ireland in 1979 wherever born.

Table 5: Estimated population in 1991 and 2001, in four age groups on the assumption of migration zero and of three constant birthrates; comparative figures for 1979; percentage distributions and dependency ratios

Age	Birthrate per 1,000 population							
	21.5	20		21		22		
	1979	1991	2001	1991	2001	1991	2001	
		Thousand						
0-14	1029.9	1060	1150	1100	1220	1140	1290	
15-44	1381.1	1760	1980	1760	1990	1760	2010	
45-64	595.9	620	750	620	750	620	750	
65 -	361.4	380	360	380	360	380	360	
Total	3368.2	3820	4240	3860	4320	3900	4420	
		Percentage						
0-14	30.6	28	27	28	28	29	29	
15-44	41.0	46	47	46	46	45	46	
45-64	17.7	16	18	16	17	16	17	
65 -	10.7	10	8	10	8	10	8	
		Dependency ratio						
	0.704	0.61	0.55	0.62	0.58	0.64	0.60	

The present Irish dependency level is a severe burden, for expenditure on education and social security, on our not-rich country. Ceteris paribus Ireland's 0.70 means that we have to devote a quarter more of our resources to dependency than a country with a ratio of 0.55 which means so much less for capital expenditure, since little of social security payment is saved. Table 5 shows, however, that, with migration zero, the Irish ratio would decline to present European levels by the year 2001.*

Our approach in this paper will now be seen to be first a setting-out of basic demographic data, to form some idea of the trend in population in the near future. Our main problem is seen to be: how will this population adapt itself to this future? In Geary and Dempsey (1977) it was strongly urged that the endemic Irish unemployment problem should be tackled directly, i. e., as many as possible people seeking jobs should be placed in jobs in Ireland. The process, it was argued, could not be left to the automatic working of the economic process, as is predominantly the case at present. It was recognised that this procedure would not result in an optimal GNP and that it would be far better if the economic process could be relied on to set the people to work. The choice is likely to be the familiar one of the lesser of two evils. It will be for the people to decide, consciously or in their instinctive reaction. Will recovery from the present depression still result in substantial unemployment and emigration as was normal in the past? Will maintenance of our birth rate at more or less present levels, and hence far higher than that of our EEC partners and other advanced countries result in a great demand abroad for Irish labour? If so, should we not prepare our potential emigrants?

Consideration to the year 2001 would be regarded as middle term though we cannot be indifferent to the short term en route thereto: c'est le premier pas qui compte. So we have sedulously sought out plans, global or in the main sectors,

* However the Irish dependency ratio will still exceed those in most EEC countries. Projected dependency ratios for EEC countries, where available, are Belgium: 0.52; Denmark: 0.51; France: 0.55; Germany: 0.46; Netherlands: 0.50; and United Kingdom: 0.57.

prepared by others, including any plans of the political parties. We would have hoped to describe these plans, and to comment on them in the light of demographic and economic analyses. We thought that there must be many such public and private plans if only because every capital action implies some vision or assumption about the future. We hoped to deal systematically, if briefly, with such matters as education, agriculture, industry, the services, major aspects of capital investment. The population aspect would predominate in this consideration.

We were disappointed in our search for middle term plans, i. e., schemes in sufficient detail to be worthy of the name, instead of vague political aspirations which in any case are short term.* It is true that planning has fallen into disrepute but (we believe) this was mainly because the plans were technically faulty; the need was ignored of keeping the plans constantly under review and modifying them as the need required in a changing environment. Efforts should be directed toward improving plans, not abandoning the approach. To repeat, every individual or group making an investment has some plan of the near future in mind, i. e., plans exist at the micro level. To make these consistent with one another there should be a macro or master plan (or plans for major sectors) and efforts made to keep to it so that it would be almost self-fulfilling.

Table 6

Table 6 is the first step in the transition from population to labour force, a term identical with "gainfully occupied" of the census, which includes numbers out of work. Main features of the trend are:-

- the fall in the percentage gainfully occupied, very marked in the last interval 1971-1979
- the great increase in the percentage in education from 4 in 1951 to 10 in 1979;
- the regular increase in number and percentage of married women not gainfully occupied.

Despite the marked increase in the total and percentage not gainfully occupied, the residual class of males and single females declined from 13 per cent in 1951 to 10 per cent in 1971 and 1979.

* Since this was written an ESRI Conference on "The Irish Economy and Society in the 1980s" has taken place (October 1981). We have made a summary of the six papers presented to this Conference, which will be made available to any one who asks for it.

Table 6: Population aged 14 or over gainfully occupied and not gainfully occupied in certain classes, 1951 to 1979, with percentages

Category	1951	1961	1966	1971	1979
	Thousand				
Gainfully occupied	1272.0	1108.1	1118.2	1119.5	1219
Not gainfully occupied	886.5	890.5	920.7	985.8	1188
In education	81.3	116.5	143.0	186.1	250
Not in education	805.2	774.0	777.7	799.7	938
Males	109.1	116.6	115.2	122.9	144 ^e
Females	696.1	657.5	662.5	676.7	794
Married and widowed	532.6	537.3	560.7	588.4	694 ^e
Single	163.5	120.2	101.8	88.3	100 ^e
	Percentage of population aged 14 +				
Gainfully occupied	58.9	55.4	54.8	53.2	50.6
Not gainfully occupied	41.1	44.6	45.2	46.8	49.4
In education	3.8	5.8	7.0	8.8	10.4
Not in education	37.3	38.7	38.1	38.0	39.0
Males	5.1	5.8	5.7	5.8	6.0 ^e
Females	32.2	32.9	32.5	32.1	33.0
Married and widowed	24.7	26.9	27.5	27.9	28.8 ^e
Single	7.6	6.0	5.0	4.2	4.2 ^e

e: Estimated

Basic sources: Censuses of population; Trend of Employment and Unemployment; Department of Education Statistical Report (1978/79).

We shall be concerned with trends in numbers in education and numbers of married women in considering how numbers in these categories reconcile with population forecasts in 1991 and 2001.

Diagram 1 illustrates in detail of year the main showing of Table 6, but in relation to total population.

Diagram 1

The regularity in the decline in the labour force percentage is evident, from about 43 in 1953 to $37\frac{1}{2}$ in 1979, the latter percentage being almost unchanged for a period of five or six years. Table 6 has shown that increases in post-primary education and in the number of married women, both groups mainly outside the labour force, explain, or explain away, this decline; the phenomenon is important, however, since it is the labour force which must support the whole population.

The macro economic trend

We now consider recent demographic and economic trends in broad categories of the labour force. We confine our remarks to aspects strictly relevant to our main objective.

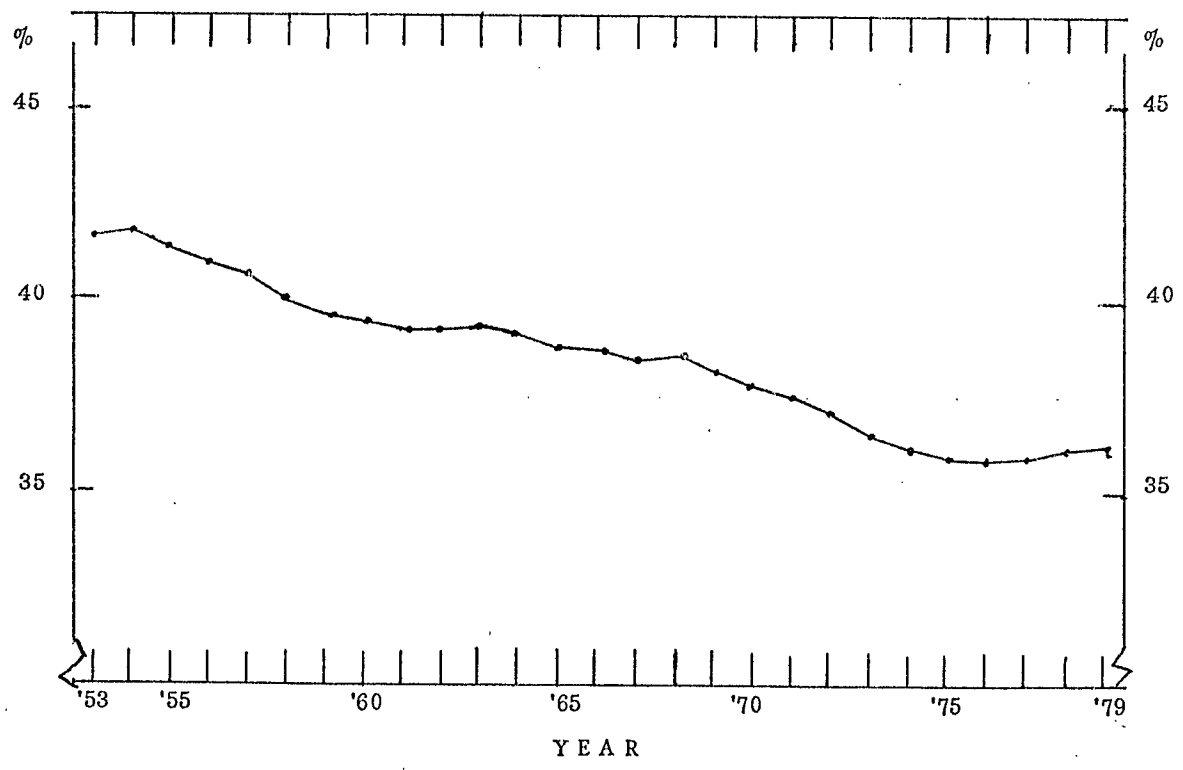
The most important feature of the demographic-economic trend in Ireland is illustrated in Diagram 2 which shows (on logarithmic scales) the near constancy of the number at work and the great increases in real terms in GDP and GDFCF; in turn the gradient of increase in gross capital formation is much steeper than for GDP: capital intensity in Ireland is increasing sharply, though later we shall have to qualify this conclusion when we consider manufacturing industry.

To analyse the persistence of the trend shown in Diagram 2 the whole period 1960-1978 has been divided into two equal periods of ten years each, i.e., 1960-1969 and 1969-1978, and the rates of change calculated for each as well as for the whole period, with the following results:-

Annual average percentage changes:

	1960-1969	1969-1978	1960-1978
No. at work	0.1	0.5	0.1
GDP	3.6	3.7	3.9
GDFCF	9.1	4.5	7.0

D I A G R A M 1
LABOUR FORCE PERCENTAGE OF POPULATION 1953-1979



Rate of gross capital formation has halved in the later decade* while real GDP has been well maintained at 4 per cent. Trends 1960-1978 are illustrated on Diagram 2.

Diagram 2

The major change in the job situation since the 1950s has been the more than halving in the number at work in agriculture as shown in Table 7. A curious feature of the industrial upsurge that began about 1960 has been its failure to lower perceptibly the number out of work, even before the present recession. As already remarked, this persistence of unemployment has been associated with the lowering of net emigration (which, as we have seen, has changed to net immigration in recent years).

Table 7

As bearing on the proportion of the population in the labour force, following are the global percentages by sex, necessarily for census years only:-

Percentages of population age 15-64 in labour force

	1951	1961	1966	1971
Males	92.7	90.4	89.5	87.8
Females	33.5	31.8	32.0	31.2
Married and widowed	8.9	10.0	9.4	11.4
Single	61.9	55.7	58.0	56.2
	<hr/>	<hr/>	<hr/>	<hr/>
Total persons	63.8	61.3	61.1	59.8
	<hr/>	<hr/>	<hr/>	<hr/>

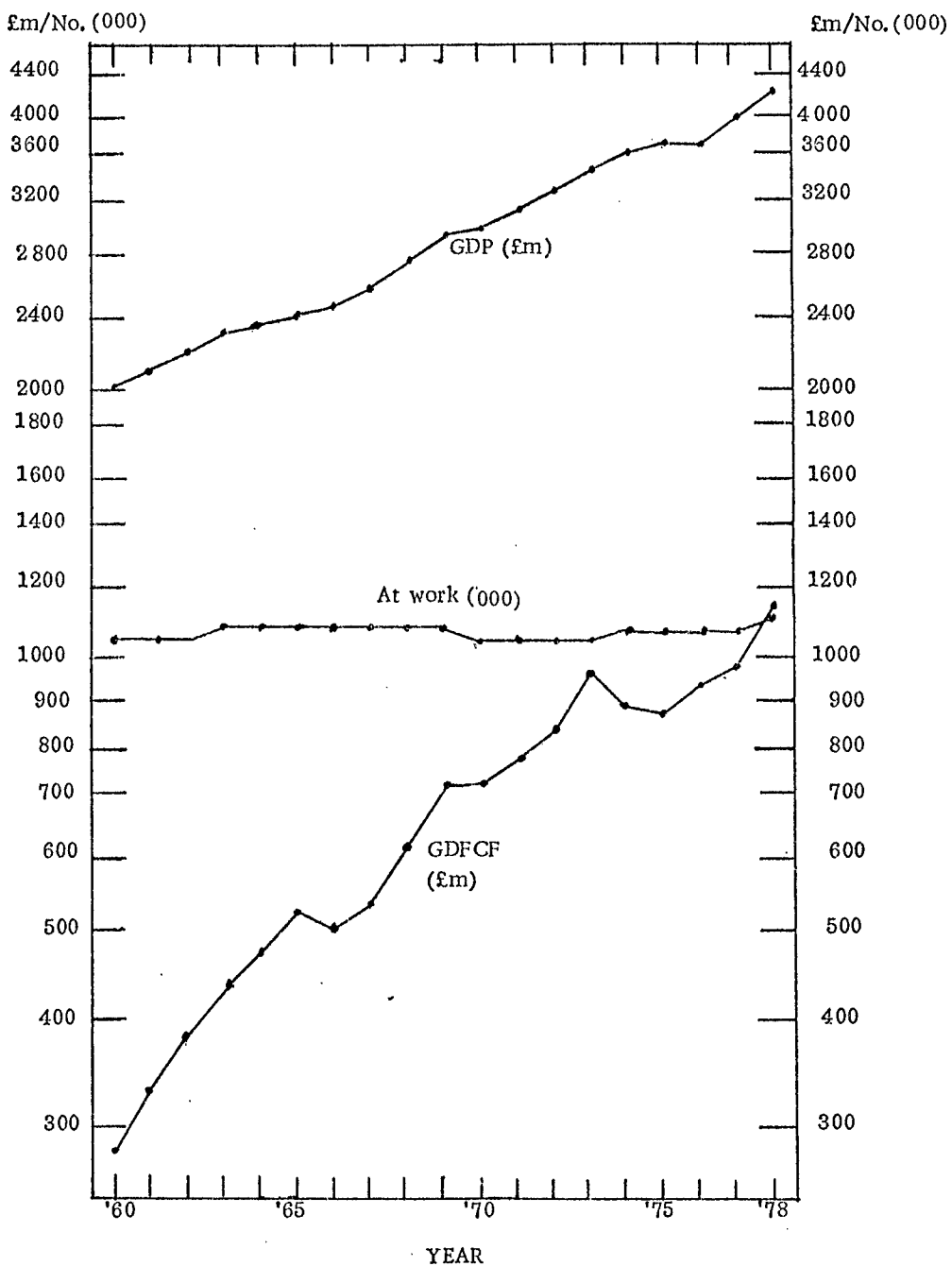
The percentage of married women in the Irish labour force is the lowest in the EEC. No doubt this is partly due to larger family cares. However, the rise in the five years 1966-1971 seems certain to continue. Relative to the declines generally over the period 1951-1971 are the facts of increased numbers in post-primary schooling and married women, both classes largely outside the labour force.

With the considerable change in the economy even in real terms over

* Largely due to the 1974 - 1976 recession.

DIAGRAM 2

GDP and GDFCF AT CONSTANT (1975) PRICES AND NUMBER
AT WORK 1960 - 1978. LOGARITHMIC SCALE



the past half century, in proportionate distribution of numbers at work in the eight major sectors outside agriculture there has been remarkably little change. The percentages from 1951 are shown for certain years in Table 8.

Table 8

The fall in the percentage in manufacturing and the rises for public administration and "other" (which includes the professions) in the nine years 1971-1980 will be noted; as also will the similarity of the percentages in 1951 (before the near revolution of 1960) and 1980, except for the significant rise for public administration.

We now consider the demographic-economic situation in agriculture and in manufacturing industry in more detail.

Table 9 has been derived from the census tables showing dependency as well as gainfully occupied in each socio-economic group. In both agriculture

Table 9

and non-agriculture dependency is increasing regularly. The ratio is always greater in non-agriculture, no doubt due to relatives assisting on farms who are gainfully occupied.

Agriculture

Table 10 illustrates the amazing changes which have taken place in European agriculture since 1960. We divided the period 1960-1978 into two equal time periods for the purpose of studying the persistency of the major trends. The figures for Ireland are not given in the publication Eurostat: National Accounts 1960-78 (Statistical Office of the European Communities, 1980) which gives data only for the other six countries shown. Following are principal inferences from the table:-

Table 10

- the magnitude of the changes;
- the enormous decline in the working populations; the persistence of this decline in the second period, despite

Table 7: Percentage distribution of the total labour force in major groups as shown, 1951, 1961, 1971, 1980

	1951	1961	1971	1980
At work in -				
Agriculture (AFF)	39.3	34.2	24.4	17.8
Non-AFF	57.1	60.7	69.8	76.2
Out of work	3.6	5.0	5.8	6.0
Labour force -				
Total number (000)	1261.9	1108.1	1119.5	1237

Basic source: Trend of Employment and Unemployment.

Table 8: Percentage distribution of persons at work in eight non-agricultural sectors, 1951, 1961, 1971, 1980

Sector	1951	1961	1971	1980
Mining, quarrying, turf	1.4	1.4	1.3	1.3
Manufacturing industries	24.6	26.4	27.3	25.8
Building construction	11.9	8.9	10.8	10.9
Electricity, gas, water	1.3	1.5	1.8	1.5
Commerce, insurance, finance	22.4	23.6	22.0	21.3
Transport, communication, storage	8.3	8.1	7.7	7.2
Public administration, defence	5.5	6.0	6.3	7.6
Other non-agricultural activity	24.6	24.1	22.7	24.4
No. at work (ex. AFF) (000)	720.9	673.0	781.7	943

Basic source: Trend of Employment and Unemployment.

Table 9: Number of dependents per person gainfully occupied in agriculture, non-agriculture and total population, 1951-1979

Year	Agriculture	Non-agriculture	Total
1951	1.19	1.42	1.33
1961	1.44	1.60	1.54
1966	1.53	1.60	1.58
1971	1.55	1.70	1.66
1979	1.6 ^e	1.8 ^e	1.76

e: estimated

Basic source: Censuses of Population.

- the vast increase in real value per head, hence prosperity;
- Ireland's real value per head was lowest of the seven's in 1969 but was much higher than Italy's in 1978;
- in all seven the changes in kind and to a large extent in degree are similar.

By far the most prosperous agricultural communities amongst the seven were those of Belgium and Netherlands: this did not prevent their having large and persistent declines in workers, particularly in the case of Belgium.

Ireland's percentage decline in number of agricultural workers was almost the same in the two periods, and these declines were generally less than those for far more prosperous agricultural populations. Presumably Ireland's real agricultural output (added value) per head will continue to increase, to the point of reaching latest levels of other countries shown in Table 10. But such countries have experienced even greater percentage declines in number than has Ireland. We infer that if and when Ireland reaches such levels there is no prospect of a relaxation in the rate of decline.

The great increase in labour productivity shown by all seven countries has been due mainly, but not entirely, to declines in working population. In the case of Ireland the percentage additions in total real added value were 7.2 in 1960-1969 and 35.2 in 1969-1978; the remarkable increase in the later period, bridging EEC membership, will be noted, but it should also be noted that income per person in real terms has fallen by over 50 per cent in 1979 and 1980 with a further decline in 1981, presaging a more rapid decline in working population.

Manufacturing industry

We start our section on manufacturing industry with a citation of certain results given in Geary and Dempsey (December 1977). Here it was shown that in 1968, with variable 1 capital per unit labour, 2 earnings per worker, and 3 ratio of numbers of female to male workers:-

$$r_{12} = .63$$

$$r_{13} = -.46$$

$$r_{23} = -.68$$

Table 10: International comparisons of real output and persons engaged in agriculture, 1960-1978

	Ireland	Belgium	France	FR Germany	Italy	Netherlands	United Kingdom
1. No. at work 1978 (000)	226	198	1933	1597	2919	284	652
2. Percentage change in numbers at work -							
1960-1969	-23.6	-40.2	-30.8	-33.2	-39.6	-26.8	-29.3
1969-1978	-24.2	-37.4	-32.6	-32.9	-25.7	-16.2	-19.9
1960-1978	-42.1	-62.5	-53.3	-55.2	-55.1	-38.7	-43.4
3. Added value (£) at constant (1975) prices per person at work -							
1960	1040	2434	1578	1275	756	2570	1214
1969	1459	4145	2520	2047	1624	4078	2109
1978	2602	6741	4218	3695	2256	6838	3492
4. Percentage change in 3							
1960-1969	40.3	70.3	59.7	60.5	114.8	58.7	73.7
1969-1978	78.3	62.6	67.4	80.5	38.9	67.7	65.6
1960-1978	150.2	177.0	167.3	189.8	198.4	166.1	187.6

Basic sources: Ireland: NIE 1977 and 1978, Other countries: Eurostat 1980, National Accounts 1960-78 (Statistical Office of the European Communities, 1980).

Table 11: Job gains and job losses in manufacturing industry, 1973-80

	Thousands							
	1973	1974	1975	1976	1977	1978	1979	1980*
(1) Gross jobs created	21.4	16.7	15.6	20.6	22.1	21.3	23.6	20
(2) Gross job losses	11.6	20.0	27.1	18.1	15.9	14.7	14.9	25
(3) Net change in employment	9.8	-3.2	-11.5	2.5	6.2	6.6	8.7	-5
(4) Employment in December each year	210.4	208.6	196.1	201.8	205.5	213.1	221.2	n.a.
(5) Net increase in employment in calendar year (b)	7.3	-1.8	-12.5	5.7	3.7	7.6	8.1	n.a.

* Provisional

Sources: NESC, No.53, Table 16 for 1973-1979; J. Durkan and C. McCarthy (1981) for 1980

Note

For 1973-1979, CSO is the source of (4) (and hence of (5)), IDA of (1), (2) and hence (3). From method of calculation job losses include job changes.

All ccs are significant at the NHP = .001 level. The unit is the individual industry of which there were 22. As regards capital stock, they are based on the estimates by Henry and Scott (1971) which extend only to the year 1968. The ccs show that earnings per worker and capital intensity are closely related; capital-intensive earnings per worker are lower in female-intensive industries, as is well known. However, even with sex ratio constant, the relationship between capital and pay intensity is strong; in fact $r_{12.3} = .49$, significant at NHP = .001. When variable 1 is OLS-regressed on variables 2 and 3 the contribution of variable 3 is insignificant. On regression of variable 1 on variable 2 it is concluded that an increase in capital (at 1958 prices) of £1,000, would result in an increase in earnings per worker of £79 at 1968 rates.

In the same paper what is described as "utterly unexpected" is the entire absence of relationship between increase in volume of industrial output and increased capital intensity. The ccs are formally negative (but insignificant) in the two intervals 1953-1960 and 1960-1968.

The relationship between increases of output and employment in manufacturing (44 industries) in four periods were examined in the paper cited by simple OLS regression of percentage increase in employment on percentage increase in volume output. The intervals were 1953-1960, 1960-1966, 1966-1973, 1973-1976. The coefficients were all highly significant, all near one-half; the intercepts were all negative but three of the four values were insignificant. The conclusion in the paper is the important one that in manufacturing industry in Ireland in the period 1960-1973 percentage increase in employment is half percentage increase in output minus one. We repeated the simple regression for the period since 1973 (in fact 1973-1979), to find: -

$$Y_c = -1.76 + 0.48 X, F = 32.8, r = .66,$$

$$(2.93) (5.73)$$

with notation obvious. While the coefficient of about $\frac{1}{2}$ of percentage increase in output persists in this latest period, the intercept is now significantly more

than unity in absolute value. The relationship in the period 1973-1979 might be: annual average percentage increase in employment is about one-half percentage for output less $1\frac{3}{4}$.

Another result in the paper is that numbering the four periods 1, 2, 3, 4 the variable being the percentage increase in volume of manufacture (44 industries), the successive ccs are:

$$r_{12} = .40; r_{23} = .52; r_{34} = .48$$

All are significant at NHP = .01. It is concluded that there is a tendency towards persistence in time in industrial success (or lack of it).

It would be useful to know the total number of jobs created per extra unit in manufacturing, a subject much discussed by interested persons. We suggest that the ascertainment of such figures, with special regard to small towns and other regional aspects, be made the subject of a special inquiry. In this connection the trend in the proportion borne by number in manufacturing in the total at work in non-agriculture has special relevance, though it cannot be argued that, because the proportion is persistent at about 25 per cent the multiplier is 4! But, if not, what is it? It would be important to know. The proportion is given for four years in Table 8. The trend, over 28 years, is shown in Diagram 3.

Diagram 3

Again the regularity of the graph is remarkable. There are few irregular breaks from year to year. The persistence of 27 per cent for all the years but one from 1962 to 1975 will be noted as well as the continual decline since.

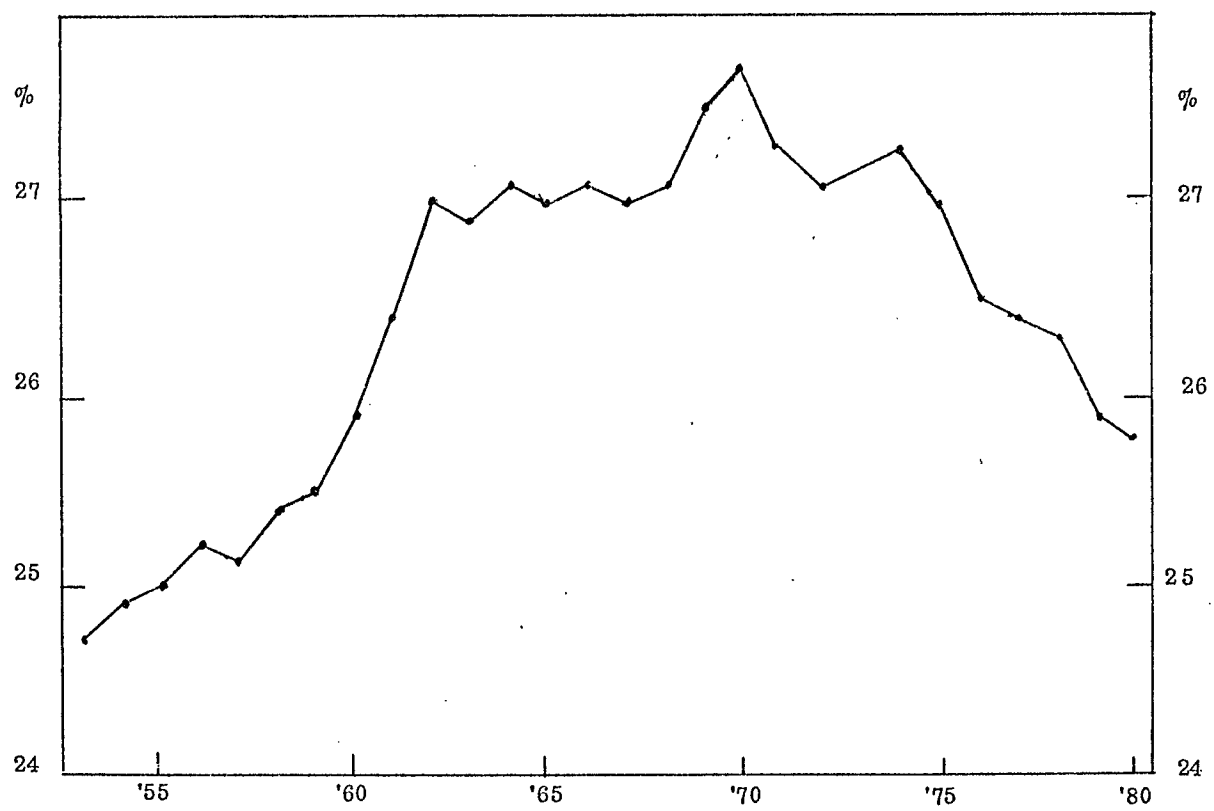
IDA is the source of data for heads (1), (2) and (3) 1973-1979 in Table 11.

Table 11

There is no serious discrepancy between the rows of figures (3) (IDA) and (5) (CSO), (3) adding to 19.1 in 1973-1979 and (5) adding to 18.1. In these seven years (1) gross jobs created averaged 20,200 a year and (2) gross jobs lost

D I A G R A M 3

Number at work in manufacturing as percentage of non - AFF at work, 1953-1980



18,400 so that average annual gain was 1,800. Net job creation has been almost static with an annual job turnover of a surprising 8 per cent. The IDA's success in aggregate is mainly in the economic field, rather than in net job creation, though it seems to have had considerable effect in distribution of jobs in manufacturing to rural areas.*

Reference must be made to the marked increase in the capital intensity in manufacturing industry. Our earlier analysis, for the whole economy it is true, showed a large increase in real GDFCF (see Diagram 2) with a near constant labour force. Unfortunately no official estimates are available for fixed asset investment in Ireland. There are, however, estimates made by R. N. Vaughan (1980) for a long series of years up to 1973 for each of about 40 industries and for total manufacturing industry. In the 20 years 1953 to 1973 net capital stock at constant (1958) prices per worker increased from £943 to £2,634 or by 5 per cent a year with absolute regularity. This seemed certain to continue.

Future labour force

Our approach here is to be forecast numbers in the three main divisions of the labour force, namely number at work in agriculture, in non-agriculture and total out of work, in 1991 and 2001. As was remarked earlier in connection with estimates of population in these years, we are less concerned about accuracy than with imparting reality to remarks on policy with which the paper concludes.

As yet no Irish model of equations worthy of the name is available for middle term forecasting and authoritative forecasts of individual items are rare:

* For a detailed discussion of the effect of the IDA on the regional distribution of employment and income see NESC Reports No 57 (1981) and No 51 (1980).

we shall mention all we know.* In the absence of a model we rely exclusively on extrapolation from trends of individual items from 1960 or simple OLS regressions. We have made several estimates of each of the three variables mentioned. Many of these were from formulae derived from single steps from 1971 to 1979 which, as census years were deemed to afford more accurate recent data. In other cases trends using all the annual data from early postwar census years were used. Granted the purpose of the exercises we shall not be specific about methods of estimation because this might imply justification by method of estimation: as researchers know to their cost excellence of relationship during estimation period (high \bar{R}^2 , DW near 2 etc.) is no guarantee of superiority in forecasting. All we can claim is that the selection of estimates we give in Table 12 is rational. Our whole approach is based on the fact that, in the past since 1960 and even before it, it has been shown that, before the present recession there exist marked regularities and consistencies at macro demographic and economic levels and trends, in rates if not in raw data, despite great changes in detail. Naturally we expect these regularities to persist. Preference in each set will be based on similarity in forecast rates to those of the past. When in doubt we shall incline towards the lower forecast for those at work in non-agriculture, convinced as we are that future growth everywhere will be more in machines than people. We also have an instinctive preference for figures that show the lesser change.

Agriculture. There are three estimates yielding the following as at work:-

	1979	1991	2002
		(000)	
Ag 1 } Ag 2 } Ag 3 }		156	118
	223	152	112
		165	128

* When this was written the only detailed study of the near future in Ireland we had was "Ireland in the Year 2000" (NBST/AFT, 1980) which here we term "Ireland 2000" and which we found useful. Since, there has occurred (in October 1981) the ESRI Conference on "The Irish Economy and Society in the 1980s", which we use later.

Ag 1 is based on all years 1971-1979, Ag 2 on single step 1960 to 1978, Ag 3 on single step 1971 to 1979. H. O'Neill in Ireland 2000 gives 135,000 for 1991 obviously based on the AFT estimate of 140,000 for 1990. With no great conviction we set our own at 150,000 for 1991 and 110,000 for 2001.

Non-agriculture. Three future estimates (with official 1979), as at work, are as follows:

	1979	1991 (000)	2001
Non-ag 1		1,165	1,501
Non-ag 2	922	1,191	1,494
Non-ag 3		1,181	1,452

Non-ag 1 is based on OLS simple regression of persons at work on real GDP annually 1960-1978. The equation is

$$\text{Non-ag 1 (in thousand)} = 501.1 + 0.2346 \text{ GDP (in constant } \text{£m)}^*$$

Non-agricultural GDP at constant (1970) prices for this equation were (with 1978 official figure):-

	£m
1978	1,608
1991	2,786
2001	4,261

Non-ag 2 is the sum of estimates for each of the eight major groups, each a single step extrapolation from 1971 and 1979 data. Non-ag 3 is a single step extrapolation from the totals for 1971 and 1979. The three sets of estimates are satisfactorily close together; it is not argued that this fact makes them reliable forecasts but only that it makes choice easier.

There is, in fact, a conflict in the principal constituent of the non-agricultural workforce, namely the number at work in manufacturing industry. In

* This is not a serious econometric equation, but simply an expression of the relationship on average between output and employment in non-AFF

Ireland 2000 P. White estimates this as 420,000 in AD 2000. Our 2001 figure, a constituent of Non-ag 2, is only 330,000. White's estimate would be 26 per cent of the figure he gives of the labour force in AD 2000, namely, 1,600,000, compared with 21 per cent in 1980. His estimate is based on an annual increase of 9 per cent in real output of manufacturing, far larger than that obtaining very steadily over the period 1960-1978, namely 5 per cent. White deduced from his 9 per cent increase in output an annual increase in manpower of 2.8 per cent. It is interesting that these estimates are consistent with each other in our manpower - manufacturing output formula since

$$\text{Percentage increase in manpower} = 9 \times \frac{1}{2} - 1\frac{3}{4} = 2.75$$

White's estimate of labour force at work in 2000 at 1,600,000 is quite near ours, as will be seen. His estimate of population of 4,100,000 is below our 4,300,000 in 2001, with migration assumed nil, and birth rate 21.

Our choice for number of persons at work in non-agriculture is 1,200,000 in 1991 and 1,500,000 in 2001.

Unemployment. This is the most speculative of the three major constituents of the future labour force but, as a rate, with remarkable constancy in the past (before the present recession) as will be seen from the last column of Table A1. We suggest only one set of estimates, that derived from one step extrapolation of 1971-1979, yielding 91,000 in 1991 and 107,000 in 2001 (rounded off to 90,000 and 110,000), compared with 74,000 in 1979. As percentages of the workforce in the years mentioned these numbers, as rates, are

	%
1979	6.1
1991	6.3
2001	6.4

So, right or wrong, the estimates have the virtue of consistency.

Labour force - a summary.

Summing up, the labour force would be derived as shown in Table 12, with comparatives for 1971 and 1979.

Table 12

We are conscious of the illogic of the rounding-off in Table 12 in the figures for 1991 and 2001, also that if they were to be regarded as true forecasts each of the constituents should have been given as a range. It would be impossible to cope with ranges so, for arithmetical convenience, we deal with each as a single figure, however dubious. With similar reserve we shall take total population (with migration nil) as 3,860,000 in 1991 and 4,320,000 in 2001, their birth rate 21 values. Before final acceptance of the labour force estimates they are related to total population and to population aged 15 or over, with comparison with years past, as follows:-

Labour force as percentage of population

Year	All ages	Aged 15 or over
1951	42.6	59.8
1961	39.3	56.5
1966	38.8	55.9
1971	37.6	54.4
1991	37	52.2
2001	40	55.5

While in both series the 1991-2001 percentages are very similar to those for the census years, the all ages series indicate a reversal of trend, which is to be hoped for.

Since a figure of 420,000 has been proposed by P. White as the number in manufacture in 2000, it must be considered. If in Non-ag 2 it were substituted for our 330,000, the other constituents remaining the same, total labour force in 2001 would be 1,820,000. Critical percentages would then be as follows:-

	No. at work in manufacture as % of -	Non-ag LF at work	LF as % of - Population
1971	19.1	27.3	37.6
1979	19.6	25.9	36.2
2001	19 (23)	22 (26)	40 (42)

(Bracketed figures based on 420,000 at work in manufacture).

The 420,000 is the more consistent in the second (and perhaps most important) column of percentages, less so in the other two; neither is satisfactory by the third column test, suggesting that both estimates are too large. The estimate of 420,000 as the number at work in manufacture in 2001 and the adjustment following from this cannot be ruled out as a possibility in the subsequent analysis.

Table 12: Estimated labour force in its three constituents in 1991 and 2001 with comparative statistics for 1971 and 1979

	Thousands			
	1971	1979	1991	2001
At work				
Agriculture, forestry, fishing	273.1	223	150	110
Non-agriculture etc.	781.7	922	1,200	1,500
Out of work	64.7	74	90	110
Labour force	1,119.5	1,219	1,440	1,720
Population	2,978.2	3,368.2	3,860	4,320

In his paper at the ESRI Conference on "The Changing Labour Force" J. J. Sexton estimates the labour force in 1991 as 1,480,000 or 1,450,000 (rounded off slightly) on two assumptions with regard to net migration, both small. His method was based on participation rates applied to population, both classified by age and sex. These estimates agree excellently with ours of 1,440,000 of Table 12 calculated quite differently. So indeed does his estimate of population aged 15 or over of 2,750,000 or 2,700,000, our single 2,760,000 in 1991.

Reconciliation

We now arrive at the crucial point, a main object of this study, of deciding the likely magnitude of the Irish population problem in the years 1991 and 2001. We conceive this problem to be the reconciliation in those years of the total of the three magnitudes (i) labour force (ii) number in post primary education and (iii) number of married and widowed women without a paid job, with the population assuming migration nil.

Post-primary education. One of the most striking and most regular growth phenomena in postwar Ireland has been that of numbers in post-primary education.

Average annual growth rates have been as follows:

	% p. a.
1951-1961	3.7
1961-1966	4.2
1966-1971	5.4
1971-1979	3.8

Hence to base extrapolation on the 1971-1979 rate should not appear extravagant. The increases in 1971-1979 were due mainly to increases in number aged 15-24, so extrapolation was based on participation rates (i. e., as fractions of population aged 15-24), which extrapolated rates were applied to estimated number aged 15-24 in 1991 and 2001 to yield the following estimates for numbers in post-primary education:-

1991	250,000
2001	290,000

Married and widowed women. Even with three different birth rates (20, 21, 22) and two marriage rates (6.0 and 6.5) six hypotheses in all, the difference between highest and lowest estimates in this group were not great, in fact 710,000-730,000 for 1991 and 810,000-855,000 for 2001. We decided to assume that the numbers will be 720,000 and 830,000. But we wish to know the number not gainfully occupied and here we must have recourse to guesswork, to a greater extent than anywhere else. Number of married and widowed women with jobs formed 9, 10, 9 and 11

per cent of total in the respective census years 1951, 1961, 1966 and 1971, almost steady, be it noted. We assume that the percentages will be 12 in 1991 and 15 in 2001 giving numbers of married and widowed women not in the labour force of 630,000 and 710,000.

Table 13

Attention is now directed to Table 13, the culmination of the reconciliation process as regards the two future years. It will be recalled that population on the one hand and its constituents on the other have been independently estimated, without forcing, so that the success of the process will be determined by the magnitude of the remainder. While proportionately this is shown in Table 13 to have been declining regularly 1951 to 1971, indeed a very desirable trend, declines to the 6.9 and 3.2 shown for 1991, and 2001 strain one's credibility. As to the quality of the forecasts we would have most confidence in the total population aged 15 or over, then the labour force, albeit with much doubt about the future numbers of women workers. In our view most doubt must attach to the figures of married and widowed women, in particular having regard to the magnitudes involved. We therefore decided to present as Table 14 the male version of Table 13 for ages 15-64 alone, since additional doubt attaches to categories for persons aged 65 or over.

Table 14

Almost the steadiest percentages encountered were the proportions for men in the labour force, namely 74.4, 74.2, 74.1, 74.2 per cent at four censuses from 1951; so we had no hesitation in adopting 74.2 per cent for estimating future number of men in the labour force as shown in Table 14. At the three censuses to 1971 the percentages male (of total males and females) in education were also steady at 51.8, 52.0, 51.4 per cent; futures were set at 52 per cent. We notice that the proportions for the remainders at about 4 per cent are now perfectly consistent.

Table 13: Population aged 15 or over in and out of the labour force in certain broad categories, numbers and percentage distributions, 1951 to 2001

Category	1951	1961	1966	1971	1991	2001
	Thousand					
Labour force	1258.8	1096.3	1109.4	1114.1	1440	1720
Not in labour force	846.9	844.8	874.2	932.9	1320	1380
In fulltime postprimary education	56.7	79.7	102.2	136.8	250	290
Married and widowed women	257.5	227.9	211.2	207.6	190	100
Total population aged 15 or over	2105.8	1941.1	1983.6	2047.1	2760	3100
	Percentage					
Labour force	59.8	56.5	55.9	54.4	52.2	55.5
Not in labour force	40.2	43.5	44.1	45.6	47.8	44.5
In fulltime postprimary education	2.7	4.1	5.2	6.7	9.1	9.4
Married and widowed women	25.3	27.7	28.3	28.7	31.9	31.9
Remainder of population	12.3	11.7	10.7	10.1	6.9	3.2

Table 14: Male population aged 15-64 in labour force and out in certain broad categories, numbers and percentage distributions

Category	1951	1961	1966	1971	1991	2001
	Thousand					
Labour force	848.6	739.7	751.5	762.9	1040	1180
Not in labour force	66.5	78.8	88.2	106.4	180	210
In full-time post-primary education	20.7	41.3	53.1	70.9	130	150
Remainder of population	45.8	37.5	35.1	35.5	50	60
Total male population aged 15-64	915.1	818.5	839.7	869.3	1220	1390
	Percentage					
Labour force	92.7	90.4	89.5	87.8	85.2	84.8
Not in labour force	7.3	9.6	10.5	12.2	14.8	15.1
In full-time post-primary education	2.3	5.0	6.3	8.2	10.7	10.8
Remainder of population	5.0	4.6	4.2	4.1	4.1	4.3

The figures for 1991 in Table 14 are based on linear interpolations of the 1971 and 2001 figures as the remainder from a formal calculation was in our opinion implausible. * The 1040,000 agrees reasonably with J.J. Sexton's ESRI Conference (1981) figures of 990,000 or 1010,000 (rounded off).

The four or five per cent in the remainder in Table 14 are mainly for those not yet at work or incapacitated. The percentage for females aged 15-64 is very much larger and requires a little analysis which may be confined to census actualities:-

	Females aged 15-64			
	1951	1961	1966	1971
	Thousand			
Population	874.3	807.5	820.9	848.0
Remainder	129.0	132.3	110.9	97.3
If male % applied	43.7	37.1	34.5	34.8
Rest	85.3	95.2	76.4	62.5

* The figures were as follows for males aged 15-64:-

	000	%
Labour force	960	79.3
Not gainfully occupied	250	20.6
In full-time education	130	10.7
Remainder of population	<u>120</u>	<u>9.9</u>
Total male population aged 15-64	1210	100.-

If the 1991 remainder here were anything like right, it might be interpreted as the labour force being larger than shown but through increased unemployment in Ireland, or the population being smaller through emigration.

The idea in the third row is to eliminate invalids and women seeking first jobs (though the purely speculative figures are probably exaggerations, as for females). The "rest" are single females aged 15-64 most of whom would be described on the census form as engaged in home duties. The number has declined sharply since 1961 and indications are of still lower figures in 1991 and 2001.

Summary and conclusions with some reflections on costs

We shall now attempt a summary of, and a conclusion from, this treatment of futures. The population and its main constituents have been estimated separately for the years 1991 and 2001. Any discrepancy in the reconciliation should appear in the remainder; if this were too large the likelihood might be that normal unemployment (i.e., in the labour force) or emigration should have increased; a remainder too small might suggest a welcome lowering of the unemployment level in the labour force, or immigration. The figures for the year 2001, especially in Table 14 for men, show that with normal development (i.e., at the general rate obtaining from about 1960 to before the present recession), including unemployment as in the past, the estimated population of some 4.3 million could be realised without net emigration.

Normality always implies an unemployment rate of 6 per cent of labour force, which policy will be directed towards reducing.

It is unnecessary to state that, as a result of the present depression, the timing for the future is wrong. We have no notion how many years it will take to shed the effects of the depression. The few economic futures we estimate will not be realised by 1991 or 2001. The timing scenario may be better as regards population, our main concern; as emphasised more than once, our principal objective is not forecasting but policy in its broadest lines as it directly affects population.

Policy implications. Points which have impressed us most so far in our analysis, as relevant to population outlook and policy:-

- the likelihood that Ireland's birth and fertility rates will continue to be large by European standards, with obvious implications for policy on education, attitude to emigration etc.;
- the enormous decline in the agricultural population is likely to continue;
- as in the past, the population level in future will be conditioned by an improved standard of living, i. e., as measured by real income per head;
- the likelihood of the continuation of Ireland's endemically high unemployment rate;
- the great increase in capital intensity in industry;
- unmarried women without paid jobs are numerous and likely to remain so in future, if with diminution in number.

Mention of these findings goes near to defining problems and policy in regard to them. We must bear in mind in the reflections that follow that the main constraint on wise action is cost, about which some remarks follow.

In our treatment the few economic statistics we use are those we deem closely related to population. There are many others, inflation,

foreign trade etc., well known as regards level and trend and their problems. The problems we deal with are education and training, agriculture, employment and unemployment, all interrelated of course.

Education in our unoriginal view is the most important activity for its effect on the country's future. A. D. Tussing (1978) has shown that, in 1974 annual costs per pupil or student were £91 at primary, £211 at secondary and £512 at third level at 1970 prices. These figures do not reflect the relative importance of the three levels, since the most important level is the primary as affecting all future citizens and as essential preparation for those children moving to higher levels of education and training. The best teaching skills should be deployed at primary level. As rapidly as possible the national pupil-teacher ratio should be reduced to 30 at most - in 1979 it was 32, declining commendably, if slowly, from 36 in 1971.* May we make a plea for the addition of S - speaking to the three Rs and to establish proficiency in RRRS as overwhelmingly the most useful for boys and girls at any level, for, with proficiency in these, all else may be added?

We shall not assume a censorious tone about Irish education and training, for that is not how we feel about it. Organisationally it is excellent and we have noted the vast and continuous increase in numbers in post-primary levels, also the recent creation of institutions like AnCO, and the special third level colleges, all with emphasis on technical and away from purely academic subjects. Most experts seem agreed, however, that Irish education is still over-academic.

We are aware that there has been considerable research in Irish education (in which, indeed, we have ourselves participated in statistical aspects) and we have no pretention here to give anything like a summary of this but only refer to a few points bearing on our main topic. In our reading about education in Europe generally we have noted the observation that development in education

* Average figures however, give a misleading impression of actual pupil-teacher ratios. In 1978/79 66% of ordinary national school classes had in excess of 30 pupils per class, this accounting for 75% of all pupils. Thus to reduce all class sizes to below 40 pupils would, on a formal calculation, require the hiring of not more than 3,300 teachers. (This presumes that there is no scope for the redistribution of pupils among classes with below 40 pupils in size). Doubt has lately been expressed as to the validity of the use of this ratio as a measure of efficiency in education (see Kellaghan and Martin, cited in Irish Times, June 4, 1981).

has proceeded according to education's own ideas and rules which are regarded as somewhat out of line with rapid economic and social changes generally. We do not know how true this is of Ireland; we express only our conviction that education should be a preparation for life, with special emphasis on working life.

The National Manpower Service of the Department of Labour rightly pays great attention to the problem of school leavers. While the Survey Team of the Investment in Education Reports (1965 and 1966) found that of the 17,500 national school pupils who left full-time education in 1962-63, no fewer than roughly 9,000 or 53 per cent left without having completed fifth standard; though the Team remarked that these figures were exaggerated, none created more alarm in the Reports. Happily the situation has vastly improved since that time.

The latest available information of the position of school leavers is from the 1980 National Manpower Services survey of school leavers. It yields the following figures:-

Position of 1978/79 leavers from second-level schools in May of 1980

Status	No. (000)	%
Employed	43.4	68.0
Unemployed (after loss of job)	1.8	2.8
Seeking first job	3.1	4.8
Student	12.8	19.9
Unavailable for work	1.5	2.3
Emigrated	<u>1.4</u>	<u>2.2</u>
Total	64.1	100.0

Source: NMS, Survey of School Leavers (1980)

Note

This survey, carried out in May 1980, reveals a reasonably satisfactory situation for young people, with 7.6 per cent out of work as, against a national average of 6.0 per cent in April 1980, and 88 per cent in jobs or further education about a year after leaving school. It is interesting to note the breakdown of those seeking work by the level at which they left school. Of those who left with no qualifications 19 per cent were seeking employment; with Inter Cert/Group Cert 9 per cent; and Leaving Cert 5 per cent. This finding suggests positive returns in terms of employment for additional years at school.

We have already remarked that the worst feature of Irish emigration in the past was the lack of skills amongst emigrants, which destined them for the lowest jobs in the countries of immigration. If the present birth rate is maintained there is a reasonable probability that movement will be sizeable again. If so, it is essential that movers be well trained and generally well prepared before leaving. Movement between jobs should become normal amongst Europeans and further abroad, as good for individuals and hence good for the nation which is a collection of individuals. The word "emigrant" with its unfortunate historical trail of association should be dropped from the language. There is great truth in the adage "Travel improves the mind", particularly relevant to jobs. Work abroad should be preferred to long-term unemployment at home.

In 1978 public expenditure in 1978 prices* on education in its major categories, current and capital was as follows:

<u>Level</u>	£m.
First	130
Second	153
Third	41
Total	324

It has been estimated that reduction of the pupil-teacher ratio to 40 at first level would increase the public cost of first level education by £10m in 1978 prices** which we would regard as small compared to the benefit derived. Future costs (at constant 1975 prices) with present day actual are as follows:

Year	Public expenditure, on education	
	£m	as % of GDP
1978	184	5.6
1991	460	7.2
2001	830	8.6

* Private expenditure on education was £78m in 1978.

** D. O'Mahony, cited in Irish Times, June 4, 1981.

We may appear to have devoted undue attention to education. We would resist this in our conviction that the future wellbeing of the nation depends mainly on the right kind of education.

Agriculture. As another value judgement we deplore the vast decline in numbers at work in agriculture, which decline seems certain to continue, while recognising that young people leaving the land probably improve their income in real terms and leave more per head for those who stay. Insofar as these leavers are untrained for urban employment problems. IDA has been fairly successful in its policy of directing factories to rural areas, so improving the rural population situation but there are obvious constraints on this policy.

We consider that almost the worst defect in the market economy we practice in the West is that it precludes us from feeding that hungry billion (in a world population of some four billion) because they can't pay. Of course it is not suggested that action should consist only in sending food to the hungry; it should be mainly in helping them to produce their own food, thus creating much work in many home industries. Instead, under stress of CAP and administered agricultural prices we have periodical mountains of this product or that. One would hope that major future policy of the West would be directed towards elimination of world hunger, some of which is at home and the need extends to more than foodstuffs. In Ireland such policy might result in retaining more workforce on farms.

Employment and unemployment. Little attention has been given to the Costa Dempsey, Geary (1977) thesis that the economic process will never suffice to absorb the long-term unemployed, that a Special Works Programme (SWP) under the NMS (to become an Authority) be set up directly to put the unemployed to work while recognising that the autonomous working of the economic system would be far the better solution. These findings were influenced by the doleful prediction of the European COMET model that (with estimation period 1954-1971) the Irish

unemployment rate in 1980 would be by far the worst in EEC^{*}. Of course all these gloomy prognostications imply unchanged conditions in future and are designed in fact to persuade authority. It was pointed out by Costa, Dempsey, Geary that, were it not for the huge unemployment rate in the two or three great unskilled groups, numbering some one-eighth of the labour force, endemically with 20 per cent out of work, Ireland could not be said to have an unemployment problem at all. In the year 1970-71 some 2,000 boys entered these occupations; while most of these subsequently improved their situation, too many remained. It follows, almost syllogistically, that more young people should receive higher education and training to reduce the too large labour pool of unskilled. It was argued that trained people can always get jobs.

Costa estimated that at 1977 prices and allowing for saving on unemployment payment, all the unemployed could be set to work voluntarily for less than £100 million a year, which is not much these days.

The too many young people's going to unskilled jobs must be largely due to their coming from impoverished homes, thus perpetuating poverty. To ensure that everyone capable of benefiting from higher education and training receives it, educational subsidies to poor families should compensate not only for cost of education but for income of families lost by its young people's not going out to work.

It has been argued that expenditure on education is essentially investment in the individual; in fact there is reason to think, by reference to differential lifetime incomes that this investment has a very high yield. In recognition of this fact there has recently been recourse to the practice of borrowing to cover the cost of higher

* Happily the rate, given as 16.5 per cent, has not been realised even under recession conditions.

education, to be repaid in instalments out of the recipient's future earnings. We consider this to be an excellent practice worthy of extension to all socio-economic classes but only if the rates of interest payable are well below their present usurious levels, perhaps with the help of subsidy.

We are well aware of the faults of personal subsidies. Geary (1973) showed that, in relation to national income, level of social security payments in Ireland were highest in EEC. There is a real hazard of social security becoming a way of life. B.M. Walsh (1978) showed that there is a positive relationship between increase in average length of sojourn on the Live Register and increase in social security payment and J.G. Hughes (1981) has lately shown that persons ill at any time in 1979 constituted 12 per cent of the workforce, compared with 6.6 per cent in 1954 and that ill and unemployed together in March 1979 numbered more than a quarter of the total workforce. These facts are disquieting.

Geary and Hughes (1970), to obviate the humiliating sense of rejection by society on the part of long-term unemployed, suggested that all workers should be endowed with a civil service type contract. Perhaps the need for it was exaggerated in the sense of a wide measure of acceptance of unemployment as a normal social condition with income payments at near present levels. It would be a pity if this were the case.

We have shown that single women engaged in home duties are numerous and little imaginative effort is needed to realise that their condition must be unsatisfactory. To a certain extent this is recognised by their being granted a pension at the age of 58, but this is not nearly enough. We suggest that realistic payments be granted to single women of all ages who are looking after elderly incapacitated people. We are unaware that this problem has ever received specific attention, and as our least recommendation we suggest it should now be examined.

Costs

There is not much point in a paper like this without mention of policy implications which inevitably involve public expenditure. The financial constraint is almost the only deterrent against social amelioration. Results recently derived from MODEL-80 (Bradley, Digby, Fitzgerald, Keegan, Kirwan), shown in Table 15, have relevance to this whole inquiry.

Table 15

It will be seen that public expenditure in both its modes has exacerbating effects on two of our most serious national problems, the balance of payments and government borrowing. It is almost unbelievable that one million pounds' expenditure should in the base year (0) cause a worsening of the balance of payments of about the same amount, while the situation in this regard improved by the fifth year. Public borrowing was also very large but is mitigated to some extent by increased revenue. Real GNP rises by about a £million. While the unemployment diminution effect is considerable in base year (0) by the second mode of expenditure it is curious that this improvement turns into an increase of 57 in unemployment in the fifth year. In general, however, the employment effects are small.

We have made proposals for expenditure on setting a large number of the unemployed directly to work, possibly increased expenditure on education (since the suggestion that to an extent higher education should be paid for by its recipients themselves is unlikely to be accepted) and increased social security payments to many unmarried women with dependents engaged on home duties. All these payments would come from the public purse with proportionate effect like those shown in Table 15. We should add in regard to the second mode of expenditure that increased public employment in the model is described as in "public administration". We are not

Table 15: Effect on specified variables of a £ million increase in public expenditure at constant (1975) prices on 1 current expenditure on goods and services (excluding public employment) and 2 public employment
Values in £m.

Specified variable	Effect of increase of £1m in public expenditure			
	1. Excl. pub. emp.		2. Pub. emp.	
	Year 0	Year 5	Year 0	Year 5
1. Balance of payments (export excess)	-0.98	-0.57	-0.86	-0.71
2. Personal consumer expenditure	0.38	0.35	0.29	0.48
3. Employment, non-agricultural	39	46	271	118*
4. Public borrowing	1.07	0.94	0.55	0.62
5. Public expenditure, current	1.28	1.45	1.00	1.31
6. Public revenue, current	0.21	0.51	0.45	0.69
7. Labour force	18	47	125	174
8. Non-agricultural profit	1.02	1.09	-0.27	-0.16
9. Unemployment	-21	1	-146	57
10. GNP (1975 prices)	1.08	1.09	1.03	1.20

Source: Bradley, Digby, Fitzgerald, Keegan, Kirwan (1981)

* Units: number for 3, 7, 9, rest £m (at 1975 prices)

Note

MODEL-80 has 266 endogenous variables (and hence 266 equations) with 130 exogenous variables and 100 behavioral equations, hence 166 identities. The system is non-linear and was solved by single equation OLS regression. The estimation period was annual using data from 1960 to 1977. The effect shown are cumulative through six years 0-5. The first two columns represent the effect of an increase of £1m. in the exovar specified. The last two columns are effects achieved through the intermediary of an expenditure of £1m on an endovar public authorities net current expenditure calculated to produce 237 employment in public administration, an exovar.

sure that the type of employment contemplated in Costa, Dempsey, Geary (1977) largely of unemployed whose normal occupation is unskilled would come under this head; if not we suggest the model should provide a separate heading: or a sub-model constructed with this problem central to it. Table 16 discourages any form of public expenditure, however worthy its motive. Or is basic reform of Irish public finances the real need, especially in the determination of priorities? Has public financial policy been the principal cause of the dangerous rapid increases in balance of payments and national debt? The MODEL-80 showing works both ways; perhaps the best policy for reducing these would be by a corresponding reduction in public spending to repeat with close regard to priorities, and sacrifice progressively distributed.

The main finding is that during the next 20 years the endemic unemployment rate of about 6 per cent of the labour force will not be reduced without emigration. This conclusion, like most others in the paper, is tentative and may be changed by events, including changed plans. We emphasize the supreme importance of education. We hope that the statistics displayed and the suggestions therefrom will promote continuous discussion, consideration and planning modification as required.

APPENDIX

Table A1: Demographic statistics, real GNP per head and unemployment rate, 1946-1979

Year	Population (000)	Birth rate	Death rate	Marriage rate	Emigration rate	GNP per head (1970 prices)	Out of work as % labour force
1946	2957	23.0	14.0	5.9	7.3	N.A.	-
1947	2974	23.2	14.8	5.5	2.7	289	-
1948	2985	22.1	12.2	5.4	6.2	303	-
1949	2981	21.5	12.8	5.4	10.1	319	-
1950	2969	21.4	12.7	5.4	12.7	322	-
1951	2960.6	21.2	14.3	5.4	9.8	328	3.6
1952	2953	21.9	11.9	5.4	12.6	338	-
1953	2949	21.2	11.7	5.4	10.8	348	5.3
1954	2941	21.3	12.1	5.4	11.9	353	5.3
1955	2921	21.1	12.6	5.6	15.4	362	5.1
1956	2898	21.0	11.7	5.8	17.2	361	5.3
1957	2885	21.2	11.9	5.1	13.8	364	6.7
1958	2853	20.9	12.0	5.3	20.0	362	6.4
1959	2846	21.1	12.0	5.4	11.6	383	6.1
1960	2832	21.4	11.5	5.5	14.9	399	5.6
1961	2818.3	21.2	12.3	5.4	13.8	421	5.0
1962	2830	21.8	12.0	5.5	5.7	430	5.0
1963	2850	22.2	11.9	5.5	3.3	443	5.0
1964	2864	22.4	11.4	5.6	6.1	466	4.7
1965	2876	22.1	11.5	5.9	6.4	473	4.6
1966	2884.0	21.6	12.2	5.8	6.6	476	4.7
1967	2900	21.1	10.8	6.1	4.8	496	5.0
1968	2913	20.9	11.4	6.5	5.1	527	5.3
1969	2926	21.5	11.5	6.9	5.5	548	5.0
1970	2950	21.8	11.4	7.0	2.3	559	5.8
1971	2978.2	22.7	10.7	7.4	2.5	571	5.8
1972	3024	22.7	11.4	7.4	-3.9	596	6.3
1973	3072	22.4	11.1	7.4	-4.4	608	5.9
1974	3123	22.1	11.2	7.3	-5.4	619	5.7
1975	3176	21.2	10.4	6.7	-6.0	524	6.4
1976	3226	21.0	10.6	6.4	-5.1	618	7.0
1977	3269	20.9	10.2	6.0	-2.4	643	7.6
1978	3311	21.1	10.0	6.3	-1.6	674	6.9
1979	3368.2	21.5	9.7	6.2	-5.2	N.A.	6.1

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