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Some Irish Population Problems Reconsidered

by

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THE ECONOMIC AND SOCIAL RESEARCH INSTITUTE.

SOME IRISH POPULATION PROBLEMS RECONSIDERED.

by Brendan M. Walsh.

CORRECTIONS.

Page 25 - Table 14. Instead of head as in text under Dependent Variable insert:-

$$\frac{s_{i-1}P_{i-1}-P_i}{s_{i-1}P_{i-1}}$$

and instead of head under Independent Variables insert:-

$$\text{Constant } \frac{(s_{i-1}P_{i-1}-P_i)}{s_{i-1}P_{i-1}}$$

Page 30 - Second column (top of page before diagram) insert D_t at end of sentence.

Data Sources: For Page 69 substitute Page 22.

Some Irish Population Problems Reconsidered

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Preface

The author would like to thank all those who have helped him in the preparation of this study. In particular, R. C. Geary suggested many helpful ideas. Improvements were also suggested by C. E. V. Leser and M. P. Fogarty.

Acknowledgement is made of the use of the facilities of Tufts University Computation Center.

"Through most of this country, great marks of improvement were observable, though its progress had received a severe check during the last two years, the effect of which was peculiarly to aggravate the predominant evil of Ireland, namely a population greatly in excess above the demand for labour. . . ."

Malthus to Ricardo

Letter of 17 August 1817.

The Works and Correspondence of David Ricardo, edited by Piero Sraffa, Volume VII, (Cambridge, 1952), p. 175.

SOME IRISH POPULATION PROBLEMS RECONSIDERED

by

BRENDAN M. WALSH*

INTRODUCTION

There are two prominent landmarks in the post-war literature on Irish demographic problems, namely, the 1954 Reports of the Emigration Commission and C. E. V. Leser's recent paper.¹ The former is a comprehensive survey of Ireland's demographic peculiarities, accompanied by judgments on their consequences and suggestions for their alleviation. The latter presents a detailed examination of the trends revealed in the returns of the 1961 Census of Population.

The purpose of the present paper can best be explained in reference to this literature. The Emigration Commission gave what has become the standard commentary on Ireland's poor marriage pattern, high marriage fertility and high emigration. In the first three Parts of this paper an alternative view of the Irish demographic situation is presented. In addition to supplementing the evidence available in the Emigration Commission, the material on fertility and nuptiality presented in this section of the paper forms the basis for an interpretation of Irish demographic trends that assigns low nuptiality the role of offsetting high marriage fertility and thereby keeping the rate of natural increase in check. This view of the situation places Ireland near the end of the transition from high birth and death rates to low birth and death rates that all economically developed countries have undergone: the combination of low marriage rates and high fertility of marriage has also been an intermediate phase for some other European countries, where it was followed by low birth rates achieved by high marriage rates combined with low

marriage fertility. Part IV is concerned with the present breakdown in Ireland's century-and-a-half-old method of population control, occurring as Irish nuptiality rises to more normal levels. The consequences for the rate of natural increase of a more normal marriage pattern, given the existing level of marriage fertility, are explored. In this area the paper is continuing the work of Leser, who first documented the demographic transformation at present under way in Ireland, but it is not intended to provide predictions about the rate of natural increase in view of the uncertainty regarding the course of fertility.

The possibility of higher rates of natural increase implied by the rising level of nuptiality poses the problem of discovering how that higher potential increase of the population will be distributed between actual population growth and emigration. Parts IV and V are an investigation of the determinants of emigration with particular reference to the influence of natural increase. The evidence presented suggests that there is no tendency for the supply of labour in Ireland to generate its own demand for labour. Thus, other things being equal (among them the level of unemployment in the United Kingdom and the autonomous factors that influence the demand for labour in Ireland), it appears that higher rates of natural increase in Ireland will lead to higher rates of emigration from the country. The contemporary Irish demographic transformation has therefore important implications for the future level of emigration from the country.

In Part VI the topic of the population's participation in the labour force is discussed in the belief that this is an important determinant of labour supply and relevant to the theme of the earlier Parts of the paper. The probable changes in participation rates for various segments of the population are examined in the light of international comparisons and cross-section analysis of the 1961 Census data.

¹Commission on Emigration and Other Population Problems Reports, (Dublin, 1954) referred to as the Emigration Commission; C. E. V. Leser, "Recent Demographic Developments in Ireland", *Reprint No. 10*, The Economic Research Institute, (Dublin, 1965).

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The overall objective of the paper is twofold. First, a re-evaluation of some important aspects of the Emigration Commission's interpretation of Irish population problems is presented. This attempt at reinterpretation is important because it provides a fresh look at some of the most fundamental as well as most unusual aspects of Irish society. Secondly, the paper takes the present transformation of the

Irish marriage pattern as the starting point for an analysis of the future course of labour supply in Ireland and its probable effect on emigration. These topics have an important bearing on medium term economic forecasting, but the paper's relevance to questions of social attitudes and policy is its most urgent claim to attention.

PART I: THE LEVEL AND TREND OF IRISH NUPTIALITY

A useful summary of the level of nuptiality in a population at a point of time is given by the percentages of single women in each of the age groups between 15 and 50 years. Celibacy in these age groups reduces the probability of child-bearing almost to zero in countries (such as Ireland) where illegitimacy is rare. For this reason the level of celibacy in the child-bearing age groups has important repercussions on the rate at which the population is reproducing itself, as will be discussed in Part III below.

Table 1 provides a fairly complete international comparison of the level of celibacy among women of child-bearing age, together with information on Ireland at each complete Census since the war. The

omission of underdeveloped countries from Table 1 is unimportant since high celibacy rates are found only in countries where Western European traditions are strong, and Albania may be taken as representative of the areas outside of Europe and the New World in regard to marriage patterns. The well-known poor marriage record of the Irish is clear from the table, as is the steady upward trend in Irish nuptiality since the war. It is important to note that even in 1966, when the level of celibacy among women aged 25-29 in Ireland had fallen to two-thirds its 1946 level, the percentages single in all the younger age groups in Ireland (which reflect the most recent and highest marriage rates) were still the highest recorded in any country.

TABLE 1: PERCENTAGES OF WOMEN SINGLE IN CHILD-BEARING AGE GROUPS IN IRELAND, 1964-1966, AND IN VARIOUS COUNTRIES ABOUT 1961

Country and Year	Age Group							Average Duration of Celibacy
	15-19	20-24	25-29	30-34	35-39	40-44	45-49	
Ireland 1966	98.4	74.8	37.8	24.1	21.2	19.5	20.4	14.8
Ireland 1961	98.9	78.2	45.1	29.6	23.5	22.0	22.1	16.0
Ireland 1951	98.9	82.3	54.4	36.4	28.5	26.7	26.3	17.7
Ireland 1946	98.4	82.5	57.5	38.8	32.1	27.6	26.3	18.2
Albania 1955	75.4	23.8	7.7	3.8	2.5	1.7	1.5	5.8
Austria 1961	94.0	58.0	24.2	15.9	14.4	12.4	12.1	11.6
Czechoslovakia 1961	91.3	32.8	10.0	6.9	6.5	6.2	6.2	8.0
Denmark 1960	95.1	45.9	14.5	9.4	8.2	8.1	9.4	9.5
Germany (BRD) 1961	94.9	54.6	20.8	13.3	12.7	10.8	9.3	10.8
Greece 1961	94.2	65.3	34.7	18.2	10.1	8.2	n.a.	n.a.
Hungary 1960	85.3	31.4	11.2	8.5	7.6	7.4	7.3	7.9
Netherlands 1960	96.3	59.4	20.5	12.1	10.4	10.1	11.0	11.0
New Zealand 1961	91.6	40.5	12.4	7.8	7.3	7.4	8.3	8.8
Norway 1960	95.2	49.8	17.8	11.6	10.9	11.2	12.9	10.5
Peru 1961	83.4	44.2	25.0	17.8	13.2	14.6	14.5	10.6
Poland 1960	90.9	40.3	17.3	14.0	15.1	19.0	24.3	11.0
Portugal 1960	95.3	62.1	32.0	21.8	18.2	16.9	15.9	13.1
Spain 1960	97.9	73.4	34.9	20.1	15.3	15.5	14.6	13.6
Sweden 1960	97.3	57.5	20.7	11.9	10.0	9.5	11.0	10.9
United Kingdom 1961	93.4	42.0	15.7	10.9	9.8	9.5	10.5	9.6
United States 1960	83.9	28.3	10.5	6.9	6.1	6.1	6.5	7.4
Venezuela 1961	77.3	41.8	26.8	22.1	21.3	24.1	24.6	11.9

Data Sources: United Nations, *Demographic Yearbook*, 1962, 1963, Tables 13, 34 respectively; C.P., 1966, Vol. II, Table 2.

The last column of Table 1 provides a summary statistic of the level of celibacy over the child-bearing age groups. This "average duration of celibacy" is calculated as five times the sum of a row divided by 100: five is the interval of all the age groups, so that

five times the sum of a row equals the aggregate number of years of celibacy spent by 100 women in each country, projecting the experience of the individual age groups over a generation. This index measures the combined effect of a country's average

age at marriage and level of permanent celibacy in reducing the exposure of women to marriage over their reproductive life. By this measure the four leading countries are Ireland (1946, 1951, 1961 and 1966), Spain (1960), Portugal (1960) and Venezuela (1961). Some explanation of this pattern of celibacy might be sought in relatively unfavourable male/female ratios in these countries (due to higher mortality, which would affect males more than females, or to the greater net emigration of males), but in fact much the same pattern of celibacy holds among males, so this hypothesis cannot be accepted. On this evidence the highest levels of celibacy recorded in the world are found in countries with predominantly Catholic populations. The present-day concentration of low marriage rates in Catholic countries does not appear to have received much attention in the literature, although the low nuptiality of the Catholic population of the United States has been remarked.² Some further considerations on this subject will be presented in Part III below.

The data of a row in Table 1 are collected in a particular Census year and therefore reflect the experiences of different generations. It would be valuable to present information on the percentages of successive generations that were single as they passed through each age group, although a disadvantage of this longitudinal presentation is that it could only be completed when a generation had reached the age of 50 and would thus lag behind current trends. This dilemma recurs in other demographic situations. Its relevance to the present discussion is that we are made aware of the danger of projecting the reduction in celibacy over time among those aged, for instance, 25-29 into an eventual equal reduction in the percentage celibate in the older age groups. To some extent the higher nuptiality of the younger age groups recorded in the more recent Irish Censuses is due to the falling average age at marriage, rather than to a reduction in permanent celibacy. Table 2 illustrates this point. Looking at the percentages single in two generations of women at different periods in their life-cycle it is clear that the reduction in celibacy between younger women of different generations overstates the eventual reduction in celibacy between the same generations when both have reached age 45-49. Out of 1,000 surviving women born in the period 1917-1921, 364 were single at age 30-34, compared with 441 out of 1,000 born in 1902-1906: a reduction of 77 per 1,000. The reduction in celibacy between these two generations at age 45-49 was only 59 per

TABLE 2: CHANGES IN PERCENTAGES OF WOMEN SINGLE IN SELECTED AGE GROUPS AT SUCCESSIVE CENSUS YEARS

Women born in:	Percentage Single of Survivors in Ireland to Age 30-34	Percentage Single of Survivors in Ireland to Age 45-49
1917-21 ..	36.4 ^(a)	20.4 ^(c)
1902-06 ..	44.1 ^(b)	26.3 ^(d)

(a) Recorded in Census of 1951.

(b) " " " " 1936.

(c) " " " " 1966.

(d) " " " " 1951.

Data Source: C.P., 1966, Vol. II, Table 2.

1,000.³ Of course, the fall in average age at marriage in itself represents an important rise in nuptiality.

Leser has shown that little of the recent rise in nuptiality is accounted for by the shift of population to urban areas.⁴ This implies that all social groups have participated in the rising marriage rates. To the extent that the 1951 and 1961 Census classification by social groups roughly overlap,⁵ Table 3 records the decline in celibacy by social group as a percentage of its level in 1951. Celibacy has been measured by the proportion of males aged 15-54 and 45-54 single. Females are classified by social group according to their occupation if they are gainfully occupied or the occupation of the person on whom they are dependent if they are not gainfully occupied; for this reason, and because single females may tend to migrate in search of marriage, the percentages of females single in a social group is not likely to be an accurate measure of celibacy in the social group.

The changes in celibacy by social group among males aged 45-54 are probably affected by the changes in the sex and age composition of these groups (caused by emigration and other factors). No very clear pattern emerges from Table 3, but it is apparent that the fall in celibacy was not confined to any narrow segment of the population. The substantial reduction in celibacy among the "Lower Professional" group is, however, striking. It is also apparent that there is a substantial stability in the position of the social groups in regard to celibacy over the decade: the coefficients of rank correlation between a group's rank in 1951 and its rank in 1961 are highly significant statistically. In Part III below an attempt is made to explain this pattern of celibacy by social group.

³The higher level of mortality among single persons contributes slightly to this outcome.

⁴*Op. cit.*, p. 187.

⁵The category "Working on Own Account" was discontinued in 1961 and its members distributed among the other groups. "Employers and Managers" seems to have been most affected: cf. C.P. 1951, Vol. III, Pt. II, p. vi.

²Cf. Clyde V. Kiser, "Differential Fertility in the United States", in National Bureau of Economic Research, *Demographic and Economic Change in Developed Countries*, (Princeton, 1960), p. 111.

TABLE 3: CELIBACY BY SOCIAL GROUP, 1951-1961

Social Group	Percentage Single Males Aged 15-45		Percentage Reduction 1951-61	Percentage Single Males Aged 45-54		Percentage Reduction 1951-61
	1951	1961		1951	1961	
Farmers and their Relations	70.5	67.4	4.4	39.9	39.9	0
Other Agriculture	70.8	66.9	5.5	44.9	43.1	4.0
Higher Professional*	45.5	43.7	4.0	9.7	10.4	-7.2
Lower Professional	65.3	51.8	20.7	20.9	13.3	36.4
Employers, Managers	32.7	35.3	-8.0	12.1	8.7	28.1
Salaried Employees	38.1	38.0	0.3	11.4	10.5	7.9
Non-manual Wage Earners	60.0	53.8	10.3	19.0	17.8	6.3
Skilled Manual Wage Earners	59.3	51.3	13.5	17.5	16.5	5.7
Semi-skilled Manual Wage Earners ..	57.3	55.9	2.4	18.9	18.6	1.6
Unskilled Manual Wage Earners ..	55.6	52.4	5.8	23.6	24.8	-5.1
Coefficient of Variation between groups	.234	.225		.539	.596	
Rank Correlation Coefficient: Rank in 1951 against rank in 1961 .. ..		.830			.877	

*Excluding Catholic Clergy.

Data Sources: C.P., 1951, Vol. II, pt. II, Tables 4, 9; C.P., 1961, Vol. V, Tables 2, 7.

The Emigration Commission stressed the adverse social and economic consequence of Ireland's poor marriage record.⁶ In the light of recent attention on Ireland's exceptionally high incidence of hospitalised mental illness it is of interest to record the first admissions rate for schizophrenia for the different marital statuses in 1964 (rate per 100,000 corresponding population, standardised for the age distribution of the population):⁷

	Single	Married	Widowed
Males ..	148	29	73
Females ..	122	35	80

⁶Cf. especially Chapter 4.

⁷Based on first admissions data for 1964. 27.9 per cent of all male first admissions and 23.7 per cent. of all females first admissions were in the schizophrenic diagnostic group. For a discussion of the evolution and significance of Ireland's position in regard to hospitalised mental illness, cf. Dermot Walsh, "Hospitalised Psychiatric Morbidity in the Republic of Ireland", *British Journal of Psychiatry*, Vol. 114, No. 506, January 1968, pp. 11-14.

The high rate of hospitalisation among the spouseless, either single or widowed, is striking and is also found in some other important diagnostic groups. This pattern is quite general and not peculiar to Ireland. It is interpreted in two, not mutually exclusive, ways: "First . . . the marriage state protects one from a psychiatric disturbance and second . . . the incipient character of psychoses is . . . likely to prevent one from entering the marriage state. . . ."⁸ The forces that contribute to the high rate of celibacy in Ireland also contribute to the high overall incidence of mental illness, a consequence of Irish marriage patterns that was not apparent when the Emigration Commission reported.

In summary, it is clear that although Ireland's marriage levels have risen considerably since 1946, they are still perhaps the lowest in the world. It is likely therefore that they will continue to rise until they are more normal. There seems to be little controversy among commentators about the desirability of reducing the level of celibacy.

⁸H. Warren Dunham, "Epidemiology of Psychiatric Disorder as a Contribution to Medical Ecology", *International Journal of Psychiatry*, Vol. 5, No. 2, February 1968, pp. 124-146.

PART II: FERTILITY OF IRISH MARRIAGES

A: Level and Trend

Ireland's high marriage fertility is well known and has been most completely documented by the Emigration Commission.⁹ A convenient measure of marriage fertility is the number of legitimate live births per 1,000 married women in each age group

⁹*Op. cit.*, Chapter 5.

from 15 to 50: although later in this Part other and more satisfactory measures of fertility will be employed, this first concept is a fairly reliable index of gross fertility differentials and has the advantage of being available for a relatively large number of countries. Table 4 provides a comparison of this measure for as comprehensive a sample of countries

as can be readily compiled. In an international comparison of Ireland's fertility it is of interest to include some of the underdeveloped countries of the world. The fertility of the Hutterite sect in North America is also included because their fertility is frequently

accepted by demographers as a benchmark for the highest rate ever recorded among any population. It is remarkable to record, on the basis of the evidence in Table 4, that not only is Ireland's marriage fertility higher than that of other European countries

TABLE 4: LEGITIMATE ANNUAL LIVE BIRTH RATES BY AGE OF MOTHER
(PER 1,000 MARRIED WOMEN IN AGE GROUP)

Country and Year	Age Group						
	10-19	20-24	25-29	30-34	35-39	40-44	45-49
Australia (1961)	552.2	356.2	246.7	140.1	66.8	20.5	1.6
Austria (1961) ..	553.4	345.3	207.2	122.9	65.4	24.3	1.3
Belgium (1961) ..	399.0	279.4	198.6	115.6	58.3	19.2	1.2
Bulgaria (1956) ..	248.0	241.8	138.8	63.5	29.4	10.4	1.9
Canada (1960) ..	541.1	374.5	255.7	161.4	89.9	32.1	2.8
Chile (1960) ..	623.9	444.5	333.9	251.6	169.1	74.5	17.5
Czechoslovakia (1961)	464.4	294.2	144.6	69.7	30.5	9.8	0.4
Denmark (1963) ..	569.2	305.4	190.9	98.5	43.2	11.5	0.8
El Salvador (1962) ..	446.7	424.1	353.8	284.8	213.4	85.7	25.8
England and Wales (1964)	473.4	295.5	213.0	115.6	53.4	13.9	0.9
Finland (1963) ..	507.7	323.7	201.3	122.6	66.7	27.5	3.1
France (1963) ..	450.1	341.5	225.6	125.1	60.7	20.2	1.6
Germany (BRD) (1963)	541.4	283.4	211.1	117.0	57.3	19.2	1.1
Hungary (1963) ..	305.2	212.9	112.9	52.1	22.6	6.5	0.3
IRELAND (1961) ..	612.6	478.0	392.3	298.6	202.4	77.1	5.8
Japan (1960) ..	302.9	338.1	235.2	91.4	26.9	6.1	0.5
Netherlands (1963) ..	517.8	321.1	264.0	172.1	92.6	32.6	2.9
Norway (1960) ..	437.5	311.4	215.9	137.1	74.6	27.7	2.7
Panama (1960) ..	465.8	400.5	301.2	177.0	116.0	39.0	8.8
Philippines (1960) ..	234.4	285.6	217.5	175.6	122.3	59.9	14.9
Poland (1960) ..	498.6	336.9	196.6	115.0	65.1	25.4	3.0
Portugal (1960) ..	413.8	350.6	245.2	159.8	111.6	51.1	5.0
Puerto Rico (1960) ..	468.3	428.9	264.8	156.4	160.8	—	—
Scotland (1960) ..	498.4	325.8	234.8	132.9	64.8	17.3	1.1
Spain (1960) ..	377.3	384.0	284.0	177.9	95.1	35.8	4.3
Switzerland (1960) ..	589.2	337.0	231.3	136.8	66.0	21.8	1.7
Sweden (1963) ..	509.6	270.0	181.5	99.9	44.0	12.0	0.9
United States (1960) ..	479.0	354.4	222.3	123.3	61.7	—	—
Venezuela (1961) ..	472.5	463.4	371.0	254.0	193.7	71.9	15.2
India-Bengali Village							
Hindus 1945-1946 ..	—	323.	288.	282.	212.	100.	33.
Hutterites—Marriages							
of 1921-1930 ..	—	550.	502.	447.	406.	222.	61.

Sources : United Nations, *Demographic Yearbook*, 1965, Table 25 and Roland Pressat, *L'Analyse Demographique*, (Paris, 1961) p. 164.

similar in religion and level of economic development (Spain and Austria, for example) but also that it is at least as high as that of the Latin American countries for which data are available. The comparison with countries like El Salvador, Panama and Chile is especially striking: these are areas with much lower income per person than Ireland and they exhibit some of the highest population growth rates found anywhere in the world. It is especially remarkable that Ireland's marriage fertility in the younger age groups should be high relative to those of the Latin American countries mentioned: in these age groups the average duration of marriage is probably very similar in all the countries compared

and Ireland's late average age at marriage cannot be responsible for the high Irish figures.

Duration of marriage is an important influence on fertility that is not allowed for in comparisons of the sort presented in Table 4. It is generally agreed that marriage duration will have an influence on the probability of having a live birth in a period of time in an area where any limitation of births is practised. The reasoning behind this argument assumes that marriage duration is a reliable proxy measure of the number of live births that have already occurred in a marriage, and that the probability of an additional birth diminishes as the existing family size increases. Ireland's pattern of late marriages implies that many

of the married women in the later age groups in Table 4 have been married for shorter periods of time than married women in the same age groups in other countries: this would tend to raise the figures recorded for Ireland in these age groups without necessarily implying a higher level of fertility. However, for those countries that may be seen to have a late average age at marriage in Table 1, marriage duration in the older age groups should be close to the Irish level and the comparison of marriage fertilities may be made from the data of Table 4 without serious danger of error. Comparison with other countries must be made with the reservation that Ireland's late average age at marriage is a contributing factor in the high figures recorded in the later age groups.

Data on family size by mother's age at marriage and duration of marriage are available for a limited number of the richer countries of the world. For all of these countries, a comparison with Ireland on the basis of these data shows much the same pattern as exhibited in Table 4. Such data have therefore been used here only for the purposes of detailed comparisons of Ireland's marriage fertility at different points of time. Geary has drawn attention to the remarkable stability of Irish marriage fertility over the period 1841-1911.¹⁰ The Emigration Commission compared average family size by age and marriage duration in 1911 and 1946 and concluded that Ireland was undergoing a sharp reduction in fertility. Disapproval of this trend was expressed: "The downward trend in family size is unwelcome and every effort should be made to arrest it." (Paragraph 211.) No specific recommendations were actually made to reverse the apparent downward trend, and some dissenting opinions to the majority view of this matter were expressed in the Reservations, but the tone of the majority report is strongly pro-natalist, expressing the belief that high marriage fertility is part of the Irish value system.

The reduction in fertility that occurred between 1911 and 1946 has not been protracted beyond 1946, as became clear on the basis of the 1961 Census returns. Table 5 brings the comparison of marriage fertility presented by the Commission up to date. No clear trend emerges from a comparison of the 1946 and 1961 data: fertility has risen slightly for the shorter durations and fallen somewhat more sharply for the longer durations. It might have been expected that aggregate fertility would have declined simply because of the declining importance in the total population of the high fertility agricultural social groups. If fertility is compared by social group between 1946 and 1961, its stability over the period

¹⁰Cf. R. C. Geary, "The Future Population of Saorstát Éireann", *Journal of the Statistical and Social Enquiry Society of Ireland*, 89th Session, (1935-36), p. 20.

TABLE 5: AVERAGE FAMILY SIZE FOR SELECTED MARRIAGE DURATIONS, IRELAND, 1911, 1946 AND 1961.

Marriage Duration (Years)	A: Average Number of Live Births per 100 Married Women Aged 15-44 at Marriage Surviving in Ireland to:		
	1911 (32 Counties)	1946 (26 Counties)	1961 (26 Counties)
0-4	99	103	109
5-9	283	255	268
10-14	421	354	356
15-19	525	416	408
20-24	596	449	421
25-29	648	478	441
30-34	677	494	460

Marriage Duration (Years)	B: Average Number of Live Births per 100 Married Women, all Ages at Marriage, Standardised for Age at Marriage: Survivors in Ireland to:	
	1946	1961
0-4	103	107
5-9	250	263
10-14	343	350
15-19	410	403
20-24	443	416
25-29	475	438
30-34	506	457

Sources: A: Commission on Emigration, *Reports*, Table 70; C.P., 1961, Vol. VIII, Table 8.

B: S.A., 1964, Table 30. Method of Direct Standardisation used in S.A. to calculate 1946 family sizes on basis of 1961 age distribution of marriages.

is even clearer than appears from the data of Table 5.¹¹

Data on average family size may be used to calculate summary measures of the prevalence of large families in Ireland. Turning once again to the Emigration Commission, paragraph 212 presents such a measure:

"The number of families in the community in 1946 with seven or more children under the age of 16 years amounted to only 13,000 or 5 per cent. of all families with children under 16 years. The number of children in these families, however, represented 13 per cent. of all children under 16 years."

This finding is of interest in itself, but it misrepresents the probability of large families resulting from Irish marriages. Clearly, families of marriages of less than 7 or 8 years' duration could not normally consist of as many as 7 live births. The relevant denominator is not all families but rather families of completed fertility. To illustrate the implications of Ireland's marriage fertility for family size, it may be

¹¹The comparison of fertility by social and religious groups in 1946 and 1961 may be made by comparing Table 17a of Vol. IX of the 1946 Census of Population with Table 15a of Vol. VIII of the 1961 Census. Comparing individual entries in the social groups for Catholic marriages, it may be seen that average family size decreased in 15 cases and increased in 12 cases.

seen that slightly more than one-third of all women aged 20-24 at marriage, who had been married for 25-29 years in 1961, had at least seven live births and that over half the children born to such marriages belonged to families of seven or more live births. (Data on the number of surviving children aged under 16 are not available.) Table 6 presents some findings on family size for selected durations and ages at marriage. The effect of postponing marriage on the probability of a large family ensuing from the marriage is clear from the table.

TABLE 6: PERCENTAGE OF FAMILIES HAVING SEVEN OR MORE LIVE BIRTHS AND PERCENTAGE OF CHILDREN BORN TO SUCH FAMILIES. MARRIAGES OF COMPLETED FERTILITY FOR SELECTED MOTHERS' AGE AT MARRIAGE, IRELAND 1961

Marriages of	Duration in 1961	Percentage of Families with 7 or more live births		Percentage of all Children in Families of 7 or more live births	
		Mother's Age at Marriage			
		20-24	25-29	20-24	25-29
1937-41 ..	20-24	31.4	17.0	52.6	33.8
1932-36 ..	25-29	34.3	18.1	56.7	35.4
1927-31 ..	30-34	35.9	20.8	58.7	39.9

Data Source: C.P., 1961, Vol. VIII, Table 8.

This analysis relies heavily on the concept of "average family size", which is the term used in the Census to refer to the live births (and not the surviving family) of women still married and living in Ireland at the Census date. Thus from any cohort of married women those who died, emigrated or were widowed are excluded. Examining, for example, a cohort of 100 female births in 1917-1921, the following is the approximate history of these women by 1961:

- 14 have died;
- 35 are living outside Ireland;
- 10 are single, living in Ireland;
- 3 are widowed, living in Ireland;
- 38 married and living in Ireland.

Thus, the Census data on average family size would refer to fewer than 40 from any initial birth cohort of 100 Irish females. The effects of mortality and widowhood operate with roughly equal force in Ireland and other European countries, but the effects of emigration and celibacy operate with unique force in Ireland. The fact that Irish marriage fertility is higher than would be expected on the basis of income or religion alone may be attributable to the selection that works in separating the women who marry in Ireland from the original birth cohort.

The selective effect of emigration and celibacy upon marriage fertility is an area that should repay direct investigation.

In view of the importance of marriage fertility to the demographic behaviour of a country, and Ireland's unusual position in this regard, it is worth developing a further measure of fertility that has been widely accepted since the Second World War. This measure takes explicitly into account the number of live births that have already resulted from a marriage, and measures fertility in terms of the probability that a mother who has had i live births will give birth to her $i + 1$ baby in a specified period of time. This *probabilité d'agrandissement* may be calculated for any defined population of women, and either for one cohort as it moves through the reproductive age groups or for a cross-section of a country's women at a point of time, consisting of various cohorts of women at different stages in their reproductive lives. It would be very desirable to calculate the latter measure for Ireland since it would provide a sensitive index of the fluctuations in marriage fertility over time, which are not easily assessed otherwise. Unfortunately, although births are now recorded by birth order, the calculation of these probabilities at a point of time is complicated by the need to estimate the number of women in the population who have already had i live births. Various schemes have been developed for weighting the number of women who have given birth to their i th baby in the recent past in order to arrive at this figure,¹² but in Ireland any such weighting procedure faces the problem of allowing for the emigration of married women. No ready solution to this difficulty is apparent. For this reason the *probabilités d'agrandissement* are presented here only on a cohort basis, which means that data relating to marriages that occurred some time ago have been used. The findings are given in Table 7. It may be seen that the probability of having at least one or two children has risen slightly over the period, while the probability of higher order births has fallen. On the whole, this table confirms the impression that marriage fertility has not shown any strong trend in either direction since the 1930's, although there is a definite tendency for the number of large families from a cohort of marriages to fall.

B: Differential Fertility in Ireland

The fertility differentials between religious groups in Ireland are pronounced. Catholics have higher marriage fertility than any of the other religious groups. This is true when the religions are compared by social group as well as in the aggregate.¹³ The

¹²Cf. Louis Henry, "Étude Statistique de l'Espace des Naissances", *Population*, Volume 6, No. 3 (1951).

¹³Cf. C.P. 1961, Vol. VIII, Table 15a.

TABLE 7: "PROBABILITÉS D'AGRANDISEMENT": WOMEN MARRYING AT AGE 20-24 IN SELECTED YEARS AND SURVIVING IN IRELAND TO 1961

Probabilities are the conditional probabilities of a live birth of order i , given that a live birth of order $i-1$ has occurred.

Year of Marriage	$i=1$	2	3	4	5	6	7
1922-1926 .. ..	.9447	.9495	.9098	.8875	.8553	.8140	.7772
1927-1931 .. ..	.9470	.9477	.9090	.8748	.8327	.7992	.7585
1932-1936 .. ..	.9560	.9479	.9004	.8662	.8182	.7775	.7585
1937-1941 .. ..	.9608	.9487	.9005	.8531	.7971	.7650	.7346

Data Source: C.P., 1961, Vol. VIII, Table 8.

religious differential need not concern us here, however, since over 94 per cent. of the country is Catholic and this percentage is probably rising. The fertility of Catholic marriages obviously dominates the trend of fertility in Ireland, and for this reason the following discussion is limited to the behaviour of the Catholic population.

The picture that emerges from an examination of the 1961 Census returns on marriage fertility by religion and social group is substantially the same as that presented by the Emigration Commission on the basis of the 1946 returns.¹⁴ Catholic marriages are most fertile among farmers, farm labourers and the "lower" socio-economic groups in the non-farm population. The differentials are considerable: for women aged 20-24 at marriage, for example, who have been married for at least 20 years, the average family size of the Unskilled Manual Workers group was at least one-and-a-half times that of the Higher Professional group.

The effect of this pattern of fertility differentials on social mobility and the inequality of the size distribution of income must be substantial. The cost of family formation is greatest among those who can least afford to pay. These arguments are obvious, and a recent survey of empirical findings on the relation between family size and social mobility supports the *a priori* reasoning that says that large families are a serious barrier to mobility and educational attainment, especially among the poorest segments of the population.¹⁵ Although no evidence on the question is yet available for Ireland there is little reason to suspect that the situation is otherwise here.

The view has gained ground among demographers in recent years that the pattern of differential fertility exhibited in the Irish Census returns—highest fertility in rural classes and among the poorer urban social groups—is a transitional phenomenon. Before the dramatic reduction in marriage fertility that occurred in Europe after the beginning of the

nineteenth century, the pattern of differentials seems to have been reversed: in some rich countries today, where low fertility has prevailed for a long period of time in all segments of the population, the pattern of differential fertility seems to be reversing itself again, with the largest families occurring among the wealthiest and best educated segments of the population. Thus the Irish differential pattern may be due to the tendency of the "higher" socio-economic groups to be the first successfully to practice family limitation, while when the knowledge and motivation that facilitate family planning become more widespread the poorer segments of the population may achieve smaller than average families in the effort to raise the "quality" (and in particular the educational attainment) of their children. In fact, when actual and desired family size are equal, economists suggest the operation of positive income elasticities of demand for children which manifest themselves in both increased quantity and increased quality.¹⁶

It might be argued that the lower average family size of the "higher" socio-economic groups in Ireland is not due to any greater prevalence of conscious family limitation among these groups but rather to physiological or other reasons. In order to clarify this issue the Census data may be examined to show the effect of age at marriage on average family size within each social group. It is a widely accepted demographic hypothesis that among people who practise fairly effective family limitation the wife's age at marriage has less influence on the average completed family size than it has among people who do not practise such limitation. The variation in family size by wife's age at marriage is thus some indication of the extent of planning exercised. In order to establish whether the differences in average family size recorded among Catholic marriages in different social groups in Ireland reflects differences in the prevalence or effectiveness of family planning between the groups, the variation in family size by wife's age at marriage has been calculated for the three highest and three lowest fertility social groups. The results are

¹⁴In fact the Commission did not study fertility by social group for Catholics alone, but rather for all religions together.

¹⁵Cf. Colin Clark, *Population Growth and Land Use*, (London, 1967), Chapter IV.

¹⁶Cf. Gary S. Becker, "An Economic Analysis of Fertility", in National Bureau of Economic Research, *op. cit.*, pp. 204-240.

TABLE 8: MEAN, STANDARD DEVIATION AND COEFFICIENT OF VARIATION: AVERAGE FAMILY SIZE (PER 100 FAMILIES) BY AGE AT MARRIAGE (15-34 YEARS). CATHOLIC MARRIAGES OF COMPLETED FERTILITY, SELECTED SOCIAL GROUPS, IRELAND 1961

Social Group	Marriages of 20-24 Years' Duration			Marriages of 25-29 Years' Duration		
	Mean	Standard Deviation	Coefficient of Variation	Mean	Standard Deviation	Coefficient of Variation
Higher Professional	385	69.0	.179	360	82.4	.229
Employers and Managers	402	123.0	.306	385	106.0	.275
Salaried Employees	383	103.3	.269	393	100.0	.254
Other Agriculture	493	173.1	.351	500	176.6	.353
Skilled Manual Workers	463	146.6	.316	482	170.5	.354
Unskilled Manual Workers	525	186.9	.356	546	197.7	.362

Mean = arithmetic mean of average family size in each of the following age groups: 15-19, 20-24, 25-29, 30-34.

Standard Deviation = standard deviation of average family size about the mean.

Data Source: C.P., 1961, Vol. VIII, Table 15a.

presented in Table 8. It is clear that not only do the "higher" socio-economic groups achieve lower average family size, but also that age at marriage makes less difference to average family size in these groups than in the "lower" groups: the coefficients of variation are consistently lower in the low fertility social groups. Thus it seems that the differences in average family size between social groups must be accepted as evidence of difference in ability to achieve a desired family size. This finding also suggests the relatively greater importance of celibacy or postponed marriage as a method of family limitation among the "lower" socio-economic groups in Ireland.

The findings of this Part may be summarised. Irish marriage fertility was seen to be extremely high by international standards, exceeding even the fertility of many underdeveloped countries. No clear

evidence of a trend in Irish fertility is available. Within the country, large differentials in fertility exist between the social groups, the agricultural and "lower" non-agricultural groups having the highest fertility. Low fertility is also associated with relatively small variation in family size by wife's age at marriage, a fact that suggests the greater prevalence of successful family planning among those in the "higher" socio-economic groups.

In the future, if Ireland follows the pattern established by the richer European countries, the overall level of fertility will decline steeply and at the same time the size of the differentials between social groups will diminish. Eventually, the existing pattern of differential fertility may be reversed. At present, it is impossible to predict how soon or how quickly any of these changes will occur.

PART III: THE RELATION BETWEEN NUPTIALITY AND MARRIAGE FERTILITY

Ireland's marriage patterns are unique in the world today, but viewed historically they are merely an extreme version of a pattern that had a very important impact on the demographic history of Western Europe from the eighteenth to the twentieth century. This so-called "European marriage pattern" differed from that observed anywhere else in the world and consisted in a late average age at marriage and a large percentage of people who never married in each generation. As Hajnal observes: "In the European pattern unmarried life for an adult woman was accepted as a normal (if perhaps exceptional) alternative to marriage."¹⁷ An important effect of this pattern was a reduction in the birth rate,

¹⁷J. Hajnal, "European Marriage Patterns in Perspective", in *Population in History*, edited by D. V. Glass and D. E. C. Eversley, (London, 1965), p. 103.

achieved before the spread of contraceptive practices. There is some evidence to suggest that nuptiality tended to be lowest in those areas of nineteenth-century Europe where marriage fertility was highest, Brittany, Belgium and, of course, Ireland for example.¹⁸ Yet it is also fairly clear that nuptiality rose before the fall of fertility in these areas, a process that we have seen at work in Ireland today. However, the higher levels of nuptiality were eventually combined with greatly reduced fertility rates.

There is a good deal of evidence to suggest that the Irish pattern of low nuptiality has evolved as a method of offsetting the country's high marriage

¹⁸Cf. Etienne van de Walle, "Marriage and Marital Fertility", *Dædalus*, Spring, 1968, pp. 486-501.

fertility. This evidence is from two sources, the first historical, the second derived from the present-day differentials in fertility and nuptiality within Ireland. We shall examine these two sources in turn, along with some international evidence on the relationship between fertility and nuptiality.

It is now clear that during the years 1770-1820 Ireland's population grew at a rate far above the European average for the period. The following are the growth rates for Ireland and for the average of 16 European countries at the beginning of the nineteenth century (annual average rates per cent.).¹⁹

Period	1791-1821	1801-1820	1821-1831
Ireland ..	1.20		1.34
European Mean ..		0.65	0.94

It seems that a number of factors contributed to the unusually rapid expansion of Ireland's population in this period. The improved diet that resulted from the spread of the potato lowered mortality; the landless, capital-less farmers' and cotters' sons were encouraged to marry early because of the need for labour to grow potatoes in rotation with corn and thus meet the high rents extracted by the landlords; there appears to have been no reduction in marriage fertility as nuptiality rose. This precarious economic system was undermined by the agricultural depression that followed Waterloo and the long upward trend in the ratio of dry cattle prices to corn and dairy produce prices.²⁰ The decline in the value of the productivity of farm labour increased the landless man's difficulty in meeting agricultural rents and discouraged early marriage. In addition to the economic forces, pressure against early marriage was probably spreading because of the growing influence and control of a Catholic clergy trained in a Jansenist moral theology.²¹ From 1820 onward, and most markedly after 1830, Irish nuptiality began to fall

¹⁹Sources: K. H. Connell, *The Population of Ireland, 1750-1845*, (Oxford, 1950), p. 25 and D. V. Glass and E. Grebenik, editors, *The Cambridge Economic History of Europe*, Vol. VI, (Cambridge, 1965), p. 62. Connell's data on Irish population growth are revisions of the previously accepted, much higher, growth rates.

²⁰Evidence of the fall in Irish nuptiality in the early nineteenth century is provided in many sources. Connell, *op. cit.*, documents the slowing-down of population growth in the 1830's and the earlier trend towards lower nuptiality. Additional evidence is cited by Raymond D. Crotty, *Irish Agricultural Production*, (Cork, 1966), Chapter II. The role of the agricultural depression following Waterloo in causing demographic change in Ireland has been convincingly argued by Crotty.

²¹For some interesting research suggestions on this topic, cf. John T. Noonan, Jr., "Intellectual and Demographic History", *Dædalus*, Spring 1968, pp. 463-485.

sharply. At the same time, due to the same economic forces, emigration rose to high levels. The new, lower pattern of nuptiality established itself first in the relatively prosperous areas of the East and Central Plains, where postponing marriage and thereby limiting family size offered the greatest prospects of achieving land ownership and improved economic conditions. Only after the second great agricultural depression of the century, in the 1870's, was this lead followed by the poorer areas of the Western Seaboard, and high levels of permanent celibacy, together with late average age at marriage, became a national characteristic.²² In contrast with the popular version of the story, the historians attribute an insignificant role to the famines of the 1840's in the evolution of the abnormal Irish marriage pattern.

This evolution of low levels of nuptiality suggests that marriages were postponed or permanently avoided due to the difficulty encountered by the predominantly agrarian population in raising large families. During the nineteenth century most other European populations were undergoing rapid urbanisation, and with this urbanisation came an accelerated decline in marriage fertility: the costs of large families were greater in the cities, the economic returns from children fewer and the city's secularism facilitated the spread of contraceptive knowledge. Ireland shared its reduction in natural increase with the countries of Europe at this time, but it was unique in its almost complete reliance on low nuptiality to achieve this reduction. Lack of urbanisation and the influence of a particular tradition of Catholicism may have been the most important reasons for this particular aspect of Ireland's demographic history.

Only since the 1930's have Ireland's marriage patterns began to alter appreciably. The rapid rise in marriage rates has been examined in Part I. It was emphasised in Part II that as nuptiality rose there appears to have been little or no reduction in marriage fertility. In contrast with the sharp fall in marriage rates that occurred in the early nineteenth century, the present rise in nuptiality does not appear to be a response to changing economic circumstances. This apparent autonomy in the behaviour of Irish nuptiality has important consequences for the impact of higher levels of reproduction on the economy in the future. These aspects of the problem will be taken up in Part IV.

The historical evidence on the origins of the present-day Irish marriage patterns may be supplemented by a considerable amount of evidence drawn from the variation in marriage rates within

²²Cf. Stuart H. Cousens, "The Regional Variations in Population Changes in Ireland, 1861-1881", *Economic History Review*, SS, XVII, 2, (1964), pp. 301-321.

Ireland today, which suggests that high marriage fertility has acted as a deterrent to marriage in Ireland. A convenient starting point for the presentation of this evidence is the paragraph in the Emigration Commission in which this idea is dismissed :

“There is fairly widespread belief that our poor marriage background is partly attributable to the fact that, since the great majority of the people of Ireland are Catholics, marriage is to them an indissoluble contract and family limitation by contraception is against the moral law. It is said that the indissolubility of marriage and, in the absence of contraception, the fear of large families deter many from marriage altogether and others until a relatively advanced age. No convincing evidence has been put before us in

support of this view. As Table 49 has shown, the marriage rates in other Catholic countries are markedly higher than in ours. Moreover, the marriage rate in the Six Counties —where only about one-third of the population is Catholic—is also exceptionally low.”
(Paragraph 166).

In Part I some evidence has already been advanced showing that the old “European marriage pattern” has persisted up to the present in its most extreme form only in a few Catholic countries. It was also remarked that the Catholic population of the United States showed a low nuptiality for that country. But the most relevant information on the association between religion and marriage rates is found in Ireland. Table 9 displays the level of celibacy for

TABLE 9A: PERCENTAGES SINGLE, MALES AND FEMALES BY AGE AND RELIGION: REPUBLIC OF IRELAND AND NORTHERN IRELAND, 1961

	Age Group						
	15-19	20-24	25-29	30-34	35-39	40-44	45-54
<i>Republic of Ireland</i>							
MALES:							
Catholics	99·8	92·4	67·2	49·5	39·1	33·8	30·0
Others	99·8	93·7	66·8	44·5	34·3	30·9	24·7
FEMALES:							
Catholics	98·9	78·3	45·4	29·8	23·7	22·1	23·1
Others	98·7	75·5	38·5	24·9	20·4	20·4	22·7
<i>Northern Ireland</i>							
MALES:							
Catholics	99·6	81·6	53·0	37·8	31·2	27·6	25·5
Others	99·2	77·7	40·8	24·1	16·0	17·1	15·5
FEMALES:							
Catholics	97·7	67·9	38·9	28·9	25·8	23·3	23·7
Others	95·8	57·8	26·3	17·5	15·6	14·8	16·6

Data Source: Republic: C.P., 1961, Vol. VII, pt. 1, Table 9. Northern Ireland: Northern Ireland, Census of Population 1961, *General Report*, (Belfast 1965), Tables 12, 13.

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TABLE 9B: MARRIAGES BY RELIGION, AGE, SEX; AVERAGE OF 1960-62 AND RATES PER 1,000 CORRESPONDING SINGLE AND WIDOWED POPULATION, 1961

Age	Males				Females			
	Catholics		Others		Catholics		Others	
	Number	Rate	Number	Rate	Number	Rate	Number	Rate
20 ..	255	2·22	8	1·51	1,173	10·92	46	9·66
20-24 ..	3,594	51·05	135	33·59	5,871	101·38	260	92·75
25-29 ..	4,729	102·58	191	76·67	4,150	130·36	145	112·05
30-34 ..	2,718	76·67	108	62·10	1,883	83·56	67	70·90
35-39 ..	1,555	50·63	65	44·79	882	43·13	33	36·02
40-44 ..	871	31·27	31	21·69	363	17·62	17	15·69
45-54 ..	728	14·07	29	10·59	256	5·39	16	5·06
15-54 ..	14,450	38·32	567	29·58	14,578	47·29	584	39·02

Data Sources: Report on Vital Statistics, 1960-62; C.P., 1961; Vol. VII, pt. 1, Table 9.

males and females, by religion, in the Republic and in Northern Ireland in 1961. The higher level of celibacy among Catholics of both sexes is striking. The differences in marriage levels between the religions may be partly or fully due to their different social class composition. In this section, no attempt is made to separate the net influence of religion from that of social class: data by religion, social class and marital status are published for neither the Republic nor Northern Ireland. It is surprising to find lower percentages of the non-Catholic population of the Republic single in all but one male age group and in all female age groups, since as may be seen from the table, the age-specific marriage rates of non-Catholics are all lower than the Catholic rates. These two facts can only be reconciled by the assumption that a much larger percentage of non-Catholic emigrants is single, so that the effects of the low marriage rate are more than offset. The low level of nuptiality found among non-Catholics in the Republic would be expected on the basis of the very sparse distribution of their population. In Northern Ireland, the largest single religious group is the Catholic and to the extent that intermarriage between some Protestant sects may run slightly contrary to convention, the small numbers in each individual sect may act as a force reducing the level of nuptiality among non-Catholics, which nonetheless remains very much higher than that among Catholics. The *Fertility Reports* of the Northern Ireland Census show the same pattern of fertility differentials by religion within each social group that is found in the Republic.

The lower level of nuptiality in the high fertility Catholic population of the Republic and Northern Ireland is suggestive of an inverse relationship between marriage and fertility rates. A search of the literature reveals that Geary in 1936 was the first systematically to test this hypothesis. Using a sample of 28 countries and the 26 counties of the Republic, he reported a significant negative correlation between the marriage rate and an approximate measure of the fertility rate.²³ Leser has confirmed the inverse relationship between these variables by county in Ireland in 1961.²⁴ In looking at the relationship between fertility and nuptiality on an international level, it is appropriate to restrict the sample to European countries: as Hajnal points out, high levels of celibacy are essentially a European phenomenon, even a Western European one. In most of the underdeveloped countries today, very high fertility is combined with very low celibacy, so an inverse relationship between these variables does not prevail throughout the world. The data of Table 10 presents a summary measure of fertility and

celibacy for a fairly complete sample of European countries in a recent Census year. The correlation coefficient between the two variables in the table is 0.851, which is significantly different from zero at the 99 per cent. confidence level.

TABLE 10: INTERNATIONAL DATA ON FERTILITY AND CELIBACY

Country and Year	Percentage of Women Aged 15-49 Single	Legitimate Live Births Per 1,000 Married Women Aged 15-49
Austria (1961)	33.8	116.4
Belgium (1961)	26.8	106.3
Czechoslovakia (1961)	24.4	92.2
Denmark (1960)	29.6	97.5
England and Wales (1961)	27.5	101.5
France (1962)	31.7	117.4
Finland (1960)	35.3	122.3
Germany West (1961)	30.9	110.8
Greece (1961)	33.2	100.0
Hungary (1960)	23.2	78.5
Ireland (Rep.) (1961)	47.9	195.6
Northern Ireland (1961)	40.7	163.5
Norway (1960)	30.4	109.0
Netherlands (1960)	33.7	138.1
Poland (1960)	26.8	123.7
Portugal (1960)	40.6	148.9
Scotland (1961)	31.7	120.4
Spain (1960)	40.3	142.5
Sweden (1960)	32.2	80.2
Switzerland (1960)	38.2	117.3

Data Source: United Nations, *Demographic Yearbook* 1965 Tables 7, 13.

Rather than rest the relationship exclusively on international or intercounty comparisons, it is interesting to compare the behaviour of these variables between social classes in Ireland. Table 11 presents some information on the level of fertility and celibacy by social group in 1961. All the correlation coefficients recorded in Table 11 are statistically significant. The relationship between the variables is clearly stronger when celibacy is measured by the percentage of males aged 45-54 single, which is the more meaningful measure of celibacy. There is some tendency for the "higher" social groups to have later average ages at marriage, due to the higher educational requirements of employment in these groups, and this reduces the correlation between celibacy and fertility when the former is measured as the percentage single in the population aged 15-54.

The findings of Table 11 and of Part II document the fact that the agricultural sector and the poorest segments of the non-agricultural population bear the greatest part of the burden imposed by Ireland's abnormal demographic patterns. The number of children per year of marriage duration is likely to be highest in these groups and permanent celibacy is far more frequent among males in these groups than among those in the low fertility groups. In contrast,

²³R. C. Geary, *op. cit.*, pp. 21-23.

²⁴C. E. V. Leser, *op. cit.*, p. 192.

TABLE 11: RELATIONSHIP BETWEEN FERTILITY AND CELIBACY BY SOCIAL GROUP, IRELAND, 1961

Social Group	Celibacy		Fertility		
	(1)	(2)	(1)	(2)	(3)
Farmers, Farmers'					
Relatives	67.4	39.9	604	377	581
Other Agricultural ..	66.9	43.1	599	386	573
Higher Professional*	43.7	10.4	343	264	382
Lower Professional ..	51.8	13.3	472	289	435
Employers and Managers	35.3	8.7	376	290	386
Salaried Employees ..	38.8	10.5	416	279	423
Intermediate Non-Manual	59.4	18.5	487	298	452
Other Non-Manual Workers	51.3	17.1	556	346	513
Skilled Manual Workers	51.3	16.5	558	345	524
Semi-Skilled Manual	55.9	18.6	615	377	548
Unskilled Manual ..	52.4	24.9	641	428	608

*Excluding Catholic clergy.

Celibacy (1) =percentage of males aged 15-54 single.

Celibacy (2) =percentage of males aged 45-54 single.

Fertility (1) =Average number of live births per 100 marriages of 30-34 years' duration, wife aged 20-24 at marriage.

Fertility (2) =Average number of live births per 100 marriages of all durations, wives of all ages at marriage.

Fertility (3) =Average number of live births per 100 marriages of 20-24 years' duration, wife aged 20-24 at marriage.

Correlation coefficients between fertility and celibacy in the 11 social groups:

Celibacy (1) and Fertility (1) = .749**

Celibacy (1) and Fertility (2) = .624*

Celibacy (1) and Fertility (3) = .740**

Celibacy (2) and Fertility (1) = .759**

Celibacy (2) and Fertility (2) = .716*

Celibacy (2) and Fertility (3) = .782**

Data Source: Celibacy: C.P., 1961, Vol. V, Table 7.

Fertility: C.P., 1961 Vol. VIII, Table 14a.

*=significant at 95 % level. **= sig. at 99 % level.

the professional and managerial (which includes shopkeepers, if they are employers) social groups have fairly small families on the average and a relatively low percentage of their males remains permanently single. Thus the burdens of large family size and permanent celibacy appear to fall most heavily on those who are least adequately equipped to deal with the resultant economic and psychological stresses.

The highly significant correlations between celibacy (or nuptiality) and fertility cannot readily be dismissed as a reflection of a common influence at work on both nuptiality and fertility. Accepting the correlation as meaningful, it is reasonable to follow Geary's reasoning:

"... it is easier to understand how the high fertility rate acts as a deterrent to marriage than the reason why the low marriage rate is a cause of the high fertility rate. At the same time, amongst certain classes or at certain periods it may well be that there has been a reluctance to assume the married state with its concomitant of parenthood."²⁵

The statistical results even suggest that this reluctance grows as the burden to be expected from parenthood increases.

The absence of an inverse relationship between fertility and nuptiality outside Europe today, and everywhere in the world until at earliest the 17th century, suggests that there is something in the post-medieval economic environment that leads to the operation of the Malthusian "preventative check" of "moral restraint". This quality may well be the length of the planning horizon used in making important decisions: only when marriage plans are affected by the size of the prospective family can a rationale for the inverse relationship between fertility and marriage levels be found.

It is somewhat unsatisfactory to try to establish the sort of relationships between fertility and nuptiality discussed here solely on the basis of aggregate data. No examination of the motivation that is involved in the numerous individual decisions that give rise to these data has been provided. A causal nexus could be disputed. We need more information on the motives that influence family formation in Ireland. It goes without saying that more is involved in the marriage decision than economic and demographic considerations. However, the sort of findings and arguments presented here are strong *prima facie* evidence of the use of low nuptiality in Ireland as a method of averting the full consequences of the prevailing high level of marriage fertility. In other words, Ireland has been a unique example of the protracted operation of the Malthusian "preventative check" on population growth, consisting of the "moral restraint" that keeps people from marrying for fear of being unable to support the families that ensue from their marriages, especially if there is no effective check on the size of these families. The desirability of this method of population control must be judged in part by considering the impact that low nuptiality has had on Irish society over the last century-and-a-half.

²⁵*Op. cit.*, p. 23.

PART IV : FACTORS AFFECTING THE RATE OF NATURAL INCREASE

The rate of natural increase, or the growth rate of a country's population in the absence of net migration, is determined by the combined influences of marriage fertility, nuptiality and mortality. For the century between 1830 and 1930 Ireland attained a very low rate of natural increase because the low level of nuptiality offset the high marriage fertility. Since the 1930's however, the situation has changed considerably: a rising level of nuptiality, combined with a fairly stable level of marriage fertility, has caused the rate of natural increase to climb substantially.

The most widely used measure of an area's natural increase is the Net Reproduction Rate (NRR). This rate may be calculated by answering the question: "How many girls would eventually be born to each female born now if the present levels of mortality, nuptiality and marriage fertility prevailed indefinitely into the future?" The NRR is calculated on the basis of a stable population in which marriage and birth rates, as well as the age structure, have reached constant levels. The NRR thus projects the nuptiality and fertility existing in various age groups in the population today over the life of future generations. Consequently, the NRR is not generally useful as a basis for forecasting actual population growth, but it is useful as a way of examining the implications for natural increase of any observed pattern of nuptiality and fertility. If the rate is 1.0, then a population would just replace itself by its present level of reproduction. If the rate is 1.58, for example, population would grow by 58 per cent. in a generation or by 1.7 per cent. annually (taking a generation of 28 years). This annual growth is referred to as the "intrinsic growth rate" associated with the corresponding NRR. Whether or not the population actually grows at this rate depends, of course, on the level of net migration over the generation as well as on the course of marriage, fertility and death rates.

It is possible to trace Ireland's NRR back to the 1930's with the help of estimates that were published by the United Nations in the 1965 *Demographic Yearbook*. The earlier data are subject to a wide margin of error, and these estimates differ slightly from some others that have appeared elsewhere, but the overall trend is clear:

	1935-1937	1945-1947	1950-1952	1955	1961
NRR, Ireland	1.186	1.404	1.467	1.454	1.678

From a situation in the 1930's when Ireland's population was reproducing itself and providing for a growth of only 20 per cent per generation, the rate

of reproduction has increased, in two marked jumps, so that in 1961 the population was reproducing itself and providing for a growth of 68 per cent per generation. Out of the 25 European countries for which 1961 data are available only Iceland and Albania had NRRs higher than Ireland's.

Ireland's NRR is not likely to remain at its present level. As has been seen, the country has an abnormally low level of nuptiality that may be expected to continue its upward trend. At the same time there is no definite evidence of a fall in the level of fertility. These two forces imply that the NRR will continue to climb.

The inverse relationship between fertility and nuptiality documented in the previous Part may well hold over time in Ireland, although the substantial rise in the NRR since the 1930's indicates that the relationship is not very close. There may well be a considerable lag between the rise in marriage rates and the fall in fertility rates, during which the NRR will rise to levels far above the European norm.

It is worth trying to quantify the rise in the Irish NRR that could occur, while realising that this exercise in no way results in forecasts of the future course of the NRR. Such an exercise is no more than an attempt to explore the demographic implications of a situation that has often been recommended for Ireland: the Emigration Commission, in particular, was emphatic about the desirability of reducing the level of celibacy while maintaining the level of marriage fertility.

In order to explore the implications for Ireland's NRR of more normal levels of nuptiality, the difference between any two NRRs may be considered as follows:²⁶

Let P_x = probability of a female surviving to age x ,

M_x = probability of a female aged x being married,

F_x = probability that a married female aged x will have a live female birth in the course of a year.

then

$$NRR = \sum_x P_x M_x F_x$$
 (if x equals five-year age groups, as is the case in the present application, these summed products must be multiplied by five to obtain NRR).

²⁶Throughout this Part, illegitimate fertility is assumed to be zero: this greatly simplifies the exposition without materially altering the results. Dr. Geary pointed out the non-uniqueness of the decomposition of NRRs originally used, and suggested the averaging of the six alternatives.

Similarly, let

$$NRR' = \sum_x P'_x M'_x F'_x$$

then

$$\begin{aligned} NRR - NRR' &= \sum [P'M'(F-F') + P'F(M-M') \\ &\quad + MF(P-P')] \\ &= \sum [PM'(F-F') + PF(M-M') \\ &\quad + M'F'(P-P')] \\ &= \sum [PM(F-F') + P'F'(M-M') \\ &\quad + MF'(P-P')] \\ &= \sum [P'M(F-F') + P'F'(M-M') \\ &\quad + MF(P-P')] \\ &= \sum [P'M'(F-F') + PF(M-M') \\ &\quad + M'F'(P-P')] \\ &= \sum [PM(F-F') + PF'(M-M') \\ &\quad + M'F'(P-P')] \end{aligned}$$

(where the summation index is x and the subscript has been dropped from all the variables for convenience).

It is seen that the difference between the NRRs is the weighted sum of three components, namely, the differences in fertility, nuptiality and mortality. Six different combinations of weights may be applied to these components and, since all are equally valid, it seems most reasonable to take a simple average of these weights, which yields the coefficient of:

$$\begin{aligned} (F-F') &= \frac{1}{6}[(P+P')(M+M') + PM + P'M'] \\ (M-M') &= \frac{1}{6}[(P+P')(F+F') + PF + P'F'] \\ (P-P') &= \frac{1}{6}[(F+F')(M+M') + FM + F'M'] \end{aligned}$$

Using this conceptual framework, a detailed comparison may be made between Ireland's NRR in 1960-62 and those of Spain and England and Wales in the same period. England and Wales has been used for comparative purposes because of the close economic and political ties between it and Ireland, although differences in religion, income per person and demographic patterns render the two countries quite incompatible in many ways. Spain has been used because it is fairly close to Ireland in income per person, demographic patterns and religious tradition.

Table 12 presents the results of these comparisons. Very little of the differential between Ireland and either Spain or England and Wales is attributable to differences in mortality. In the comparison between Ireland and England and Wales, it is clear that the rather small net difference in NRRs is due to two very large components of opposite sign: the large excess of Ireland's NRR due to her higher marriage fertility and the large deficit of her NRR due to her lower nuptiality. The contrast with Spain is less pronounced: as discussed earlier, Spain is close to Ireland at the bottom of the international list of nuptialities, and the Spanish fertility is considerably above the English. Nonetheless, the excess of Ireland's NRR over Spain's due to the higher Irish

TABLE 12: NET REPRODUCTION RATES, 1960-1962, AND INTRINSIC GROWTH RATES: IRELAND, ENGLAND AND WALES, AND SPAIN, WITH IRELAND STANDARDISED ON THE OTHER COUNTRIES' NUPTIALITY

Country	Net Reproduction Rate	Length of Generation (Years)	Intrinsic Population Growth Rate (Per cent per annum)
Ireland	1.78	31.0	1.88
England and Wales	1.31	26.9	1.00
Spain	1.25	29.3	0.77
Ireland (on Spanish nuptiality)	2.06	31.0	2.36
Ireland (on English nuptiality)	2.81	31.0	3.38

Difference between Irish and English NRRs :		
1.78 - 1.30 = 0.48	+1.27	Due to Fertility Differences
	-0.78	Due to Nuptiality Differences
	-0.01	Due to Mortality Differences
	0.48	= Total.

Difference between Irish and Spanish NRRs :		
1.78 - 1.25 = 0.53	+0.73	Due to Fertility Differences
	-0.22	Due to Nuptiality Differences
	+0.02	Due to Mortality Differences
	0.53	= Total.

Sources : United Nations, *Demographic Yearbook*, 1965, Table 13 ; England and Wales, Central Statistics Office, *Annual Abstract of Statistics*, 1966, Table 7 ; Spain, Central Statistics Office, *Anuario Estadístico de España*, 1965, Table 1.2.2 ; C.P., 1961, Volume II, Table 12, Irish Life Table Number 6.

fertility is considerable and serves to illustrate the point that even if Ireland is contrasted with a European Catholic country at roughly the same level of economic development, the implications of a more normal level of nuptiality for Ireland's NRR are considerable.

In order to illustrate these implications more precisely it is possible to calculate the NRR that Ireland would assume if she attained the Spanish or English level of nuptiality and maintained her present level of fertility. We may calculate a synthetic NRR, say NRR^* , equal to $\sum_x P'_x M'_x F_x$,

where the unprimed variables refer to Irish values and the primed variables refer to Spanish or English values. Although intended as an exercise only, these projections may have some validity as an indication of the future course of Ireland's NRR. One important qualification is, however, necessary: the exercise performed here consists in standardising Ireland's NRR on the Spanish and English nuptialities, as measured by the percentages of women in the reproductive age groups married in each country. This does not allow for the changes in marriage duration for women in each age group that may accompany the rise in nuptiality, which would have a direct effect on the F_x . However, since the age distribution of Irish and Spanish brides is now very

similar this reservation is likely to be unimportant as far as the comparison between these two countries is concerned.

The second half of Table 12 presents the Irish NRR on the assumption of the Spanish and English nuptialities. In addition, the intrinsic growth rates associated with these hypothetical NRRs have been calculated. It may be seen that if Ireland assumed Spain's nuptiality and maintained her present fertility, the NRR would rise to 2.06, implying an annual rate of natural increase of 2.36 per cent—an increase of just over 25 per cent of the 1961 rate of natural increase. This intrinsic growth rate is higher than the actual population growth rates of any European country today other than Albania, and is characteristic of some of the underdeveloped areas of the world. The intrinsic growth rate implied by the assumption of English nuptiality is 3.4 per cent annually, which is close to the highest growth rates of population recorded anywhere in the world.

The general conclusion of this comparison of NRRs is obvious but it should be stressed: unless Ireland's marriage fertility falls as her nuptiality continues to climb, the country will come to have a rate of natural increase higher than that found outside all but a handful of Central American and Asian countries today.

This method of comparing changes in NRRs may also be used to trace the trend in a country's NRR over time. It would be relevant to apply this technique to the Irish NRR in 1960-62 and 1965-67. Data for births by age of mother are not yet available for 1967, so that the comparison is made here on the basis of 1966 births alone, which means that the comparison relies too heavily on the experience of one year. The 1966 NRR was found to be 1.810, a net increase of 0.026 from its level in 1960-62. This increase was the outcome of a rise of 0.167 due to rising nuptiality and a fall of 0.141 due to falling fertility. (The effect of the probably very small reduction in mortality between the two dates has not been estimated since the 1961 Life Table was used to calculate both NRRs.) Thus over this short period the NRR continued to rise, although at a slower rate than in the previous five-year period: the fall in F_x was not sufficient to offset the rise in M_x , and it is probable that this situation will continue in the immediate future, pushing the already high Irish NRR to even higher levels.

Before exploring the way in which the rising reproduction rate will affect the Irish labour market, it should be pointed out that the growth of the population of working age, in the absence of emigration, would be more rapid than that of the total population. The Irish working-age population has been depleted through heavy emigration from these age groups in the past. While the natural increase of

the total population over the period 1961-1966 was 1.03 per cent annually, the natural increase of the population aged 15-64 was 1.51 per cent annually. (These growth rates are calculated for the whole population from the excess of births over deaths for the period, and for the working-age population, from the application of five-year survival rates to the male and female populations aged 10-59 in 1961.) Between 1966 and 1971 the population aged 15-64 will also have a natural increase of 1.51 per cent annually: despite the substantial rise in the working-age population between 1961 and 1966, there has been no reduction in its rate of natural increase over the 1966-1971 period. In contrast with these rates of natural increase is the target of 0.75 per cent. annual expansion in total employment originally envisaged in the *Second Programme*: even if employment were to grow at this rate, and ignoring the question of changes in the participation rate, the country would still have to export roughly half the natural increase of its working-age population. This comment applies with equal force to the short term projections provided in the *NIEC Report on Full Employment*.

Another illustration of the immediate impact of the higher levels of natural increase that Ireland faces is provided by the projections of population furnished by the OECD/Department of Education report *Investment in Education* (1965): in Table 2.4 of the Report projections of population are provided on the explicit assumption of the continuance of the 1961 birth rates and a low level of emigration. Thus no attempt was made to discuss the effects of rising nuptiality. This is reflected in the comparison of the projections of the 1966 population with the actual population recorded in the 1966 Census. Whereas the total population of Ireland was 1.1 per cent. above its projected level, the population aged 0-14 was 2.7 per cent. above its projection. Presumably this divergence will grow more serious when one is able to evaluate the 1971 projections. This point is of great importance since the immediate impact of Ireland's rising reproduction rate will be felt by the educational system in the form of a rising percentage of the total population aged under 14 years and a very rapid growth rate in the numbers in this age group.

Summarising the prospects for Ireland in regard to the level of reproduction, it seems likely that the continuing rise in marriage rates, combined with a fairly stable level of marriage fertility, will cause the NRR to continue its upward trend, at least in the immediate future. Very high rates of natural increase are therefore in prospect for the country. The question of how these rates of natural increase will affect the economy must now be discussed by considering their effect on the labour market and the level of economic activity.

PART V : THE IMPACT OF RISING REPRODUCTION RATES ON THE IRISH LABOUR MARKET

Emigration has played a more important role in Ireland's economic history than in that of any other modern nation. In studying the effects of a major demographic transition, such as the country is presently undergoing, it is natural to ask what the consequences for the rate of migration will be. Will the upward trend in the rate of natural increase eventually lead to higher rates of emigration? In view of Ireland's long tradition of emigration, and in the absence of any new barriers to mobility, it seems at first sight likely that when the increased number of births that is now occurring finds its way into the labour market, 15 or 20 years from now, the prospect of higher rates of emigration will be faced. The only way in which this train of events would be avoided is if the increased supply of labour in Ireland in some manner transformed itself into an increased demand for labour or if autonomous increases in demand for labour occurred as the supply increased. Thus, in order to predict the effect of rising rates of natural increase on the Irish labour market we need to know something about the way in which natural increase affects employment, unemployment and emigration. The task of providing some knowledge on this subject is approached here through a study of the impact of natural increase on net migration. The determinants of net migration are studied first on the basis of time series and then on the basis of cross-section data.

Preparatory to a discussion of the causes of net migration, a word is needed on the implications of studying net, to the exclusion of gross, migration. One of the earliest generalisations about migration was that every flow in one direction tended to establish a flow in the opposite direction.²⁷ This is true for Ireland, the net emigration that is recorded being the difference between two much larger flows into and out of the country. Another important aspect of the migration process that is lost in the net migration data is its step-wise nature; there is generally a tendency for migrants from one area to replace those who have migrated to a third area: the large cities receiving replacements from the smaller towns, the smaller towns taking migrants from the rural areas.

No direct evidence on these movements is available for Ireland, but some idea of the extent of internal population redistribution may be obtained from the Census data on birthplaces. In 1961, 18.7 per cent of the population aged 20-39 in Ireland was born in Irish counties other than its county of

residence, and for Dublin (County and County Boroughs) this figure was 24.4 per cent.²⁸

In studying net migration, no information on these topics is considered. The importance and relevance of net migration data, however, is in connection with labour market conditions: in the models to be discussed in this Part, the net flow of migrants is regarded as a labour market adjustment mechanism, helping to relate the demand and supply for labour at a given wage rate. This aspect of net migration makes it the appropriate concept in connection with a study of the effect of natural increase on the economy.

A : Time Series Evidence on the Determinants of Migration

It is natural to regard the fluctuations in the yearly level of emigration from Ireland in the post-war period as reflections of the level of excess supply of labour in Ireland and the strength of the demand for labour in the areas to which the Irish emigrate. The gap in real income per person between Ireland and either the United Kingdom or the United States (the destinations that receive the vast majority of all Irish migrants) is very large and annual fluctuations in this gap are small relative to its level. There are few barriers to Irish migration, and a long tradition of emigration that establishes a ready flow of information about the condition of labour markets abroad. These considerations warrant the assumption that there is a permanent incentive to emigrate: the question of how many respond to this incentive in any year should be discussed in terms of short-term changes in the relative availability of employment at home and abroad. Thus year to year fluctuations in migration should be regarded as adjustments caused by the changing conditions in the Irish labour market and the availability of work to the potential migrant in the United Kingdom or the United States.

In order to establish some statistically tested relationships between labour market conditions at home and abroad and the level of net migration from Ireland, a preliminary discussion of the quality of the time series data on migration is necessary.

There are no direct figures on the annual level of emigration from Ireland. The obvious difficulties of distinguishing between ordinary travellers and migrants, and between permanent and seasonal movement, of maintaining a complete and accurate enumeration of all the air, sea and road movements to and from the country have so far prevented the compilation of reliable time series data on migration.

²⁸C.P., 1961, Vol. VII, Part II, Table 8.

²⁷Cf. E. G. Ravenstein, "The Laws of Migration", *Journal of the Royal Statistical Society*, 48, (2), June 1885, pp. 167-227.

Recourse has sometimes been had to the published data on "net passenger movements" as an approximate measure of annual net migration. In fact, one recent study employed these data for econometric purposes.²⁹ It is therefore of interest to scrutinise these data and see whether anything definite may be concluded regarding their reliability.

The shortcomings of the net passenger movements figures have been widely acknowledged. OHerlihy mentions that "criticism has been raised at the reliability of these figures".³⁰ He has reservations concerning the use of the calendar year in view of the timing of major holidays at the year's end. A very far-reaching criticism is made in the Emigration Commission where attention is drawn to the fact that the net figure in any year is the difference between two very large totals, namely the total movements into and out of the country.³¹ In 1963, for example, total outward movement was estimated at 2,147,307 while the net outward movement was estimated to be 22,790. An error of 1 per cent. in the measurement of the total figure would be almost as large as the estimated net movement. The nature of the variable being measured, and especially of the movement between Ireland and the Six Counties, gives rise to a high probability of serious error in the totals.

Fortunately the Census of Population returns provide a highly reliable estimate of net migration over the intercensal period. The Census estimates are based on the identity:—net migration=recorded population change—natural increase. If these data on intercensal net migration are compared with the net passenger movement figures (aggregated on an April-to-April basis to coincide with the Census year) the following picture emerges for the period since 1951:

Years	(1) Census Estimate '000	(2) Totals of Net Passenger Movements '000	(2)—(1) '000
1951-1956	196.8	110.9	-85.9
1956-1961	212.0	177.8	-34.2
1961-1966	80.6	130.5	+49.9

The serious overestimation of net migration contained in the net passenger movement figures for the 1961-1966 period has already been noted.³² The above comparison establishes, however, not only that the net passenger movement data are highly inaccurate estimates of net migration, but also that the

discrepancy between these and the more reliable Census migration estimates has a positive trend. The use of net passenger movement data in time series migration studies must therefore be avoided.

This finding has an important bearing on the results reported by OHerlihy. On the basis of the net passenger movements data he concluded that the regressions showed evidence of a highly significant positive trend in emigration: "the trend factor shows an alarming tendency for emigration to rise possibly by two to three thousand a year".³³ This result was rationalised by an appeal to the rising rate of natural increase and the shift of population out of agriculture. The trend coefficient was statistically significant for regressions covering both the 1953-1963 and the 1948-1963 periods, but more highly significant in the longer period. Instead of the interpretation provided by OHerlihy it is now evident that the importance of the trend variable reflects the systematic bias in the data rather than any behavioural aspect of the Irish economy. In addition to undermining the role attributed to the trend variable, the nature of the data also casts serious doubt on the validity of the other findings concerning emigration and its role in the Irish labour market reported in the OHerlihy study.

The only alternative source of annual data on the level of net migration from Ireland is the annual estimates of (mid-year) population published by the Central Statistics Office. When taken in conjunction with the annual data on natural increase these population estimates may be used to form estimates of annual net migration. Leser made some use of estimates of this type for information on net migration for the year ending in June over the period 1951-1961.³⁴

Assuming that the January population can be derived from the average of the estimated populations of the preceding and following June, a series on annual population changes may be constructed on the calendar year basis and used in conjunction with the calendar year's natural increase to estimate net migration. This series is recorded in the Appendix. Comparing the five-year totals of this series (adjusted to a June-to-June annual basis) with the intercensal estimates of migration from the Census, the following is the result:

Years	Census Estimate '000	Estimates Based on Mid-Year Population and Natural Increase '000
1951-1956	196.8	195.0
1956-1961	212.0	209.1
1961-1966	80.6	84.5

²⁹C. St. J. OHerlihy, *A Statistical Study of Wages, Prices and Employment in the Irish Manufacturing Sector*, (Dublin: The Economic Research Institute, 1966).

³⁰*Op. cit.*, Footnote 24.

³¹Paragraph 256.

³²*Review of 1966 and Outlook for 1967*, (Dublin, 1967), p.14.

³³*Op. cit.*, p. 21.

³⁴*Op. cit.*, Table 19.

The new series is clearly a great improvement in accuracy over the net passenger movements data and shows no evidence of systematic bias. However, the apparently high quality of these data should not be taken at face value: the mid-year population estimates on which they are based are constructed from the intercensal population change distributed on an annual basis (this at least appears true of the final revisions of these estimates): thus the intercensal totals for estimated net migration are likely to be very similar whether they are taken from the Census returns or from the estimates of annual net migration. The question of the accuracy of the annual estimates of net migration is not settled by looking at their totals over the intercensal periods, and no other check is available. The least one may assume, however, is that the absence of the systematic bias present in the net passenger movement data represents an improvement and thus results obtained from the new series should be regarded as more reliable than those based on net passenger movement data.

Even if the estimated net migration series discussed above were accepted as reasonably accurate, it would still fall short of providing the information needed for a statistical study of migration in that it would include all migrants and provide no direct information on the migration of workers. To the extent that our series includes varying proportions of dependents and others not in the labour force, the testing of a model that treats migration as a labour market adjustment mechanism is inappropriate with these data.

Despite these not inconsiderable reservations about the quality of the data, the following model has been tested using the time series estimates of net migration derived from natural increase and estimated mid-year population data for the period 1948-1966:

$$M = a_0 + a_1 U_n + a_2 U_{uk} + a_3 (W/W_{uk}) + a_4 U_a + a_5 T + e$$

where:

- M = annual estimated net migration, in thousands;
- U_n = percentage of labour force unemployed, excluding agricultural occupations;
- U_{uk} = percentage of the United Kingdom labour force unemployed;
- W/W_{uk} = ratio of money wages in Irish manufacturing sector to money wages in United Kingdom (wages = money wage rate);
- U_a = agricultural unemployment in Ireland as percentage of estimated agricultural labour force;

- T = time trend in years;
- e = stochastic error term.

The migration variable would ideally be expressed as a rate by dividing it by the population aged between, say, 15 and 40, but annual data on the population by age are unobtainable and the total population is not a reliable proxy over a period when the age structure changed considerably. The rate of agricultural unemployment could not be estimated prior to 1951 due to the absence of annual data on the estimated total farm labour force. The trend term has been introduced solely in order to establish whether its inclusion results in an improvement in the regression equation.

The parameters of this model have been estimated using the ordinary least squares (OLS) regression procedure. The use of OLS is inappropriate to the extent that it is arbitrary to designate net migration as *the* dependent variable: migration, the unemployment rates and the ratio of Irish and United Kingdom wages are clearly jointly dependent variables, exhibiting a high degree of inter-relatedness. Ideally a complete model would be specified to allow the simultaneous determination of these variables. Some slight progress in this direction is attempted later in this section, but because of data inadequacies this present discussion is preliminary and restricted to single-equation estimation techniques. The resultant estimates of the structural parameters are therefore biased and inconsistent and should be treated with caution. The usual probability tests have been performed on the OLS regression estimates despite the fact that the assumptions regarding the parameters necessary for these tests to be valid are not realised.

Table 13 records the results for the estimated model. With the exception of the high correlation between the trend variable and the (non-agricultural) unemployment rate, the "independent" variables are not highly intercorrelated. Equation (1) yields estimates of the regression parameters that are all of the sign expected on the basis of the labour market adjustment model and that are all statistically significant (two tailed *t*-test, 95 per cent confidence level). The level of net migration from Ireland is seen to increase by about 5,000 for every 1 per cent rise in the Irish non-agricultural unemployment rate and to fall by about 10,000 for every 1 per cent rise in the United Kingdom unemployment rate. In addition, a 1 per cent fall in the ratio of Irish money wages to United Kingdom money wages induces an increase of about 1,000 in the level of net migration. This last finding is a contradiction of OHerlihy's assertion that, contrary to received opinion, the ratio of money wages is not one of the links between the

TABLE 13: TIME SERIES MIGRATION REGRESSION RESULTS
(Estimated Standard Errors in Parentheses)

Dependent Variable Net Migration ('000)	Equation Number	Independent Variables						\bar{R}^2	S _e	Durbin-Watson
		Constant	U _n	U _{uk}	W/W _{uk}	U _a	T			
1948-65	(1)	152.81 (28.42)	4.802 (0.957)	-10.904 (3.528)	-1.440 (0.285)			.749	5.52	1.82
1948-65	(2)	210.99 (38.66)	2.174 (1.565)	-6.623 (3.835)	-1.824 (0.321)		-1.006 (0.499)	.794	5.00	1.83
1948-65	(3)	247.04 (29.60)		-4.291 (3.561)	-2.017 (0.298)		-1.583 (0.285)	.781	5.16	1.56
1951-65	(4)	169.54 (39.61)	5.799 (1.006)	-10.520 (3.164)	-1.565 (0.345)	-1.931 (1.931)		.834	4.86	2.23
1951-65	(5)	143.16 (29.58)	5.401 (0.924)	-11.004 (3.129)	-1.383 (0.293)			.834	4.86	2.26
1951-65	(6)	186.24 (33.20)	2.848 (1.472)	-6.872 (3.388)	-1.634 (0.284)		-1.055 (0.508)	.873	4.26	2.41
1951-65	(7)	288.04 (28.16)		-3.680 (3.304)	-1.850 (0.291)		-1.874 (0.312)	.841	4.76	1.78

Correlation Coefficients

1948-65				1951-65			
U _n	W/W _{uk}	T		U _n	W/W _{uk}	T	U _a
U _n	-0.06	0.14	-0.76	U _n	-0.01	-0.08	-0.75
U _{uk}		-0.08	0.37	U _{uk}		-0.00	0.37
W/W _{uk}			-0.46	W/W _{uk}			-0.18
							-0.51

Date in Appendix.

Irish and United Kingdom economies. On this point his study raised some controversy.³⁵

The ratio of money wages is seen to be significant in all the specifications recorded in Table 13. The stress is placed in this study on net migration as a labour market adjustment mechanism and the influence of (W/W_{uk}) should be interpreted in this light. This implies taking the ratio of money wages primarily as an index of the relative tightness of the Irish and United Kingdom labour markets and not as an index of the real income per worker in Ireland compared with the United Kingdom. This interpretation is reinforced by the findings of Cowling's study, which show that the ability of workers to raise wage rates in the Irish manufacturing sector is not closely related to aggregate unemployment: the Irish wage-earner appears to be able to insulate himself from the endemic excess supply of labour and to obtain wage increases when output or productivity is rising rapidly or a "wage round" being negotiated.³⁶ Thus the unemployment rate on its own may not be an adequate index of the tightness of the Irish labour market.

³⁵Cf. R. C. Geary and J. L. Pratschke, *Some Aspects of Price Inflation in Ireland*, (Dublin, The Economic and Social Research Institute, 1968), p. 9.

³⁶Cf. Keith Cowling, *Determinants of Wage Inflation in Ireland*, (Dublin, The Economic Research Institute, 1966), p. 18.

A secondary interpretation of the role of (W/W_{uk}) in these results, which does not imply rejection of the first, is that there is some average gap between wages in the two countries (perhaps partly a reflection of the psychic costs of emigration) and if this gap widens too far the supply of labour in Ireland is reduced through net emigration from the country. It is hard otherwise to explain the absence of a significant upward trend in the ratio of money wages since 1948 despite the heavy emigration from Ireland over the period.

Comparing equations (2) and (6) with (1) and (5), respectively, it may be seen that the introduction of a trend variable increases the $R^2 (=1 - (1 - R^2) \frac{n-1}{n-k})$ n =number of observations, k =number of parameters) slightly in each case. The increase in explained variance due to the introduction of trend is not, however, statistically significant in either case (F-test, 95 per cent. confidence level). There is a fairly high correlation between trend and U_n for both periods and this results in greatly increased standard errors for the coefficient of U_n in those equations in which both trend and U_n are included. The negative coefficient of the trend variable is hard to rationalise except as a reflection of the downward trend in U_n and the high intercorrelation between U_n and T. If T is used and U_n omitted, as in equations (3) and (7), it is seen that the R^2 is almost

exactly the same as when U_n is used and T excluded (equations (1) and (5)). However, in equations (3) and (7) the U_{uk} variable has become statistically non-significant, and only T and (W/W_{uk}) contribute to the explained variance. It seems unsatisfactory to rely on a trend variable whose interpretation is doubtful and which reduces the explanatory role of another, theoretically important, variable. For these reasons equations (1) and (5) are the preferred specification.

One possible contributing factor in the significance of the negative trend coefficient is the steady fall in the active population in Ireland over the sample period: in 1951 there were 1,214,583 people aged between 15-44 (the group from which most migrants are drawn), and in 1961 only 1,027,089. Although the number has risen since 1961, the population "exposed" to migration undoubtedly has shown a negative trend over the sample period: the same number of emigrants at the end of the period would represent a higher migration rate than it would at the start of the period. The inclusion of a trend variable may reflect this effect when the dependent variable is measured as the number of migrants rather than as the migration rate. There is no way of testing this hypothesis as long as the absence of annual population figures by age renders the calculation of annual migration rates impossible.

Introduction of the rate of agricultural unemployment for the 1951-1966 period did not result in an improvement in the regression fit. On the basis of these findings there is no evidence of a link between the agricultural labour market and net migration, but the difficulties attendant on the measurement of agricultural unemployment may be responsible for this conclusion.

A comparison of equations (1) and (5) shows that the preferred specification performs better for the shorter period than for the longer. Perhaps the early years of the longer period were still influenced by the abnormal war-time regulations and conditions: the use of identity cards was required for travel to the United Kingdom until 1951. It is, however, reassuring to note that the Durbin-Watson statistic shows no evidence of non-randomness in the time pattern of the residuals from any of the equations.

The dependent variable in the equations presented in Table 13 includes all net migration from Ireland, but the only measure of external labour market conditions included among the explanatory variables refers exclusively to the United Kingdom. The addition of a variable measuring the United States unemployment rate did not improve the results obtained. There is, however, some direct evidence on the level of migration to points other than the United Kingdom: annual figures are published on the number of new passports issued to persons going

to employment or permanent residence "overseas". A passport is required for all destinations other than the United Kingdom. These figures may be fairly accurate as a measure of gross out-migration, although they must be considered at best approximations: people may acquire passports and not use them, and they may misstate the purpose for which the passport is acquired.

Results obtained from the use of this measure of overseas migration may have little validity as a consequence of these shortcomings in the data, but at least it should be recorded that the only independent variable that is consistently significant in regression equations using this dependent variable is the rate of agricultural unemployment. The rate of non-agricultural unemployment was not a significant influence on "gross overseas emigration":

$$M_0 = -6.03 + 0.32U_n + 1.55U_a \quad R^2 = .41 \\ (3.69) (0.35) (0.57) \quad D.W. = 1.77$$

where, in addition to symbols already defined,

M_0 = gross overseas migration in thousands

This result suggests that there may be a connection between the condition of the agricultural labour market and the rate of overseas migration, whereas the results for total net migration suggested no such connection. Many components of overseas migration might not be expected to respond to economic conditions: this is especially true of the fairly large number of religious, and to a smaller degree of the professionals, included in the figure. It is possible that the most economically responsive component of overseas migration is the agricultural workers counted in it. The relevance to the future of findings concerning the rate of overseas migration is questionable, however, in view of the recent changes in the United States immigration laws.

As mentioned earlier, it is natural to look for joint causation between the level of migration and the condition of the Irish labour market. By removing workers from Ireland, net emigration serves to reduce the labour supply and thus to lower the amount of either unemployment or employment or both. A straightforward test of the effect of net migration is provided by exploring the causes of changes in unemployment. Obviously, as employment grows we should expect unemployment to fall, although not *pari passu* because of the growth of the labour supply through natural increase and possibly rising participation rates. Migration may also reduce the level of unemployment, to the extent that the two conditions are substitutes. Testing these hypotheses on annual data for the period 1951-1966, using OLS regression, the following result was obtained:

$$\Delta U_n = 14.61 - 0.53 \Delta E_n - 0.42M \quad R^2 = 0.68 \\ (2.86) (0.10) \quad (0.08) \quad D.W. = 1.39$$

where, in addition to previously defined symbols,

E_n = the level of non-agricultural employment,
and all variables are now measured in
thousands.

Although all three variables are measured by data of questionable reliability, and the use of OLS introduces bias in this situation, the result is of great interest. It supports the contention that migration serves to reduce the level of unemployment associated with a given level of employment. However, the coefficient of the migration variable suggests that for every 100 migrants leaving Ireland, the level of unemployment only falls by 42 persons: the upper limit of a 95 per cent confidence interval about the coefficient of M in this equation only raises this figure to 60 for every 100. It appears that many migrants are not in the labour force before they leave. It would be valuable to know whether this is because they have left the labour force after prolonged unemployment, have not entered the labour force due to lack of job opportunities, or are not of working age. More refined data on migration is needed before this sort of question can be answered. The coefficient of the ΔE_n term suggests that anywhere from 75 to 31 persons leave unemployment for every 100 additional jobs that are created. This occurs even after allowing for a linear trend in the form of the intercept term. Thus, participation in the non-agricultural labour force seems to increase when the level of employment rises. This, combined with a strong upward trend in U_n if migration is not fairly high or the increases in E_n fairly large, indicates some of the magnitude of the problem involved in reducing Irish non-agricultural unemployment. We have seen that the forces behind the upward trend, natural increase in particular, will lead to increased pressure in the immediate future. It is possible to use the above equation to calculate combinations of increases in employment and levels of net migration that are consistent with stable or falling unemployment, but in view of the quality of the data used and the bias introduced by OLS in this situation, it does not seem worthwhile to interpret the point estimates of the parameters this literally. The important point that is reasonably securely established by this equation is that unemployment is reduced by both net emigration and increases in employment but by neither *pari passu*.

A brief discussion of the determinants of changes in agricultural unemployment may be added. It may be hypothesised that agricultural unemployment will rise when agricultural employment falls and that it will fall when migration and non-agricultural

employment rise. The following equation tests these hypotheses, using OLS regression procedures on the annual data for 1951-1966:

$$\Delta U_a = -6.02 - 0.72 \Delta E_a - 0.07M - 0.06 \Delta E_n \\ (3.86) (0.17) \quad (0.07) \quad (0.09)$$

$$R^2 = 0.70 \\ D.W. = 2.57$$

all variables expressed in thousands,

E_a = the level of agricultural employment.

Only the level of agricultural employment is statistically significant, and on its own accounts for slightly over 70 per cent of the variation in the changes in agricultural unemployment. The non-significance of the coefficient of the ΔE_n term suggests that the agricultural and non-agricultural labour markets in Ireland are fairly well segregated and the level of agricultural unemployment is not reduced by increasing the level of off-farm employment. The negative intercept term, although not statistically significant, is suggestive of a downward trend in agricultural unemployment, no doubt a reflection of the overall downward trend in the agricultural labour force. Since overseas migration was found to be significantly influenced by the rate of agricultural unemployment it might be supposed that M_o would be more appropriate to specify as an influence on ΔU_a than total net migration, but a substitution of M_o for M in the above equation led to no improvement in the result. Of course, all the reservations entered in connection with the earlier results apply equally here.

The relevance of this section's findings to the earlier parts of this paper lies in the link that has been documented between Irish labour market conditions and net migration. A rising domestic unemployment rate or a falling ratio of Irish to United Kingdom wages were seen to result in higher levels of net emigration, given the rate of unemployment in the United Kingdom. In addition, as employment rises within Ireland the labour supply appears to rise through increased population participation in the labour force. Neither of these findings augurs well for the impact of higher levels of natural increase on the level of unemployment and net emigration. Over the period studied, a fairly strong downward trend in unemployment offset the rising trend of natural increase, which would presumably otherwise have raised the level of unemployment and then the level of emigration. This reduction in unemployment over the period was partly due to the high rate of emigration in the late 1950's and partly to the upward shifts in the demand for non-agricultural labour in Ireland towards the end of the period, attributable

to such exogenous forces as the increased inflows of foreign capital and entrepreneurship. Thus the time series data do not explicitly show the impact of natural increase on the labour market. For a study of this we must turn to the more detailed cross-section data.

B : Cross-Section Evidence on the Relationship Between Natural Increase and Net Migration

The cross-section data on migration are far more detailed and more reliable than the time series data used in the preceding section. Each Census of Population for which data by age group are published enables us to calculate, by the application of forward-survival rates, what the population in an age group would be five or ten years from the Census date. Comparing these figures of projected population with the actual population five or ten years later provides an estimate of net migration by age group. For example, applying five-year survival rates to the 1961 population by age and sex in each county, estimated net emigration between 1961 and 1966 in the i th sex and age group, j th county, would be

$$(s_i - {}_1P_i^i - {}_1P_i^e)_j$$

where $s_i - {}_1P_i^i$ = the probability that a person of the relevant sex in the $i-1$ age group in 1961 would survive to 1966 (calculated from the Irish Life Table, number 6)

P_i = 1961 population in i^{th} age group.

P_i^e = 1966 population in i^{th} age group.

Strictly speaking, this estimate of net emigration refers to those migrants who survive to the end of the period, and it understates migration to the extent that it excludes those who migrate and then die. County estimates of net migration calculated on this basis are inaccurate in as much as the s_i vary from county to county, whereas here the national rate has been used for all counties. This inaccuracy is likely to be very small in the younger age groups, where mortality is, in any event, extremely low. Finally, it should be recalled that net migration when applied to a county refers to net movement from this county to any destination outside the county, and not merely to migration to foreign destinations. The sum of county net migration, however, is equal to net emigration from the country.

The great advantage of cross-section data of this type is that they facilitate a study of net migration by age and sex, in contrast with the aggregate time series data. In addition, the Census of Population returns achieve a degree of accuracy that could never be reached by the migration estimates based

on estimated mid-year population. The cross-section data allow one to study long-term adjustment to forces whose year-to-year variation was studied with time series data. Against these advantages, however, must be placed the drawback that a cross-section study using the Census data reflects the labour market conditions peculiar to the intercensal period studied and consequently the results obtained have limited application to the task of forecasting the future levels of net migration. Nonetheless, a casual mechanism isolated on the basis of cross-section data will remain valid over time even if the structural coefficients are dependent upon the pattern of disturbances that prevailed over the particular intercensal period for which the relationships were estimated.

Net migration was studied over the period 1961-1966: the total level of net emigration from Ireland over this period was determined by forces such as the condition of the United Kingdom labour market and the overall expansion of employment in Ireland. Neither of these forces can be introduced to help explain the intercounty variation in net migration, since their influence was constant over the period and common to all the counties. On the other hand, the level of income per person in each county may be hypothesised to vary inversely with the net migration rate: income per person measures long-run differences in the expected return to employment in a county, and emigration may be assumed to be a response to poor economic prospects. To the extent that net emigration is inversely associated with income per person, the intercounty migration differentials exercise an income equalising influence. The effect that a given growth in demand for labour has on the labour market conditions in a county depends in part on the increase in labour supply over the period. This increase is best measured by the natural increase of the population in the relevant age groups. The impact of changes in the demand for labour also depend on the level of excess supply at the start of the period as measured by the level of unemployment. The model specified here assumes that the adjustment to regional imbalances in the supply and demand for labour takes place through net migration rather than through changes in wage rates or in unemployment. Within occupations there is little evidence of large intercounty variation in Irish wage rates, and the failure of such large differentials to develop while large regional differences in migration rates exist suggests that migration rather than changes in wages is the adjustment mechanism.³⁷ Changes in unemployment over

³⁷On the intercounty differentials in wage rates, cf. E. A. Attwood & R. C. Geary, *Irish County Incomes in 1960*, (Dublin The Economic Research Institute 1963), Note to Table 1, Column 5, (p. 22).

time are not likely to be the adjustment mechanism so long as external labour market conditions ensure a demand for Irish workers outside the country. Net emigration by county is therefore expected to vary directly with the level of the county's natural increase and unemployment, and inversely with the level of county income per person.³⁸

These considerations lead to the specification of the following model:

$$\left(\frac{s_i - 1 P_i - 1 - P'_i}{s_i - 1 P_i - 1} \right) j = a_0 + a_1 \left(\frac{s_i - 1 P_i - 1 - P}{s_i - 1 P_i - 1} \right) j + a_2 \left(\frac{Y}{P} \right) j + a_3 \left(\frac{U}{U+E} \right) NF j + e_j$$

where, in addition to the symbols defined above,

Y/P = personal income per person 1960

U^{NF} = number of people "out of work" recorded in the 1961 Census returns (this excludes all those engaged in family farming)

E^{NF} = total non-family-farm employment, 1961 Census

j = 1, 2, ... 27 (Counties) Both Ridings of Tipperary included, the income variable assigned the same value for each

i = five-year age groups, separately for males and females.

The dependent variable, net emigration, has been converted to a rate by dividing it by the level of $s_i - 1 P_i - 1$, the population exposed to migration. The first independent variable defines the level of the population growth that would have occurred in the i^{th} age group in the absence of net migration. It too has been converted to a rate by division by $s_i - 1 P_i - 1$, so that it is measured in the same units as the dependent variable. By analogy with the fact that the sum of this term over all age groups *plus* the number of births occurring during the period equals the county's natural increase, this variable is referred to as the natural increase of the i^{th} age group. The following identity holds for the recorded change in population in each age group:

$$P'_i - P_i = (s_i - 1 P_i - 1 - P_i) + (P'_i - s_i - 1 P_i - 1)$$

$$\text{Actual population growth} = \text{natural increase} + \text{net migration}$$

³⁸Of course the net migration variable used refers to the total population and not just the labour force. Presumably most migrants in the age groups studied are in the labour force: participation rates are very high for both males and females at this age.

The unemployment variable measures the rate of unemployment in all age groups of the sex rather than in the i^{th} age group: either index might be used, but only the former can be calculated from the Census returns. Similarly, instead of specifying the natural increase of the i^{th} age group as a determinant of net migration in the i^{th} age group, it might be argued that total natural increase of the working-age population is the relevant measure of the growth in labour supply, workers of all ages being at least potential competitors for the same jobs. The specification used here is preferred because in the statistical testing of the model emphasis has been placed on the younger age groups, where people are just entering the labour market, at which age competition for jobs is most likely to be directly among people of approximately the same age.³⁹

In order to decide for which age groups it would be meaningful to estimate this model, the 1966 Census returns were examined to reveal the level of net migration by age and sex. The only important net migration for the country as a whole over the period 1961-1966 occurred in the age groups 15-19, 20-24 and 25-29, especially the second two of these. Net migration by county and sex in all other age groups was extremely small, and the error involved in the use of a national survival rate for all counties in preparing the estimates of net migration would become more considerable in view of the increasing mortality in the older age groups. For this reason, it was decided to concentrate on the first three age groups of the working-age population.

The level of net migration in the younger age groups in Ireland showed a far smaller decline in the intercensal period 1961-1966 than that shown in all other age groups.⁴⁰ The following are indexes of the net migration rate in selected age groups for recent intercensal periods:

Age Group	Period		
	1951-1956	1956-1961	1961-1966
All ages ..	100.0	109.4	42.2
15-24 ..	100.0	128.1	81.4

Data source: C. P., 1966, Vol. II, Table XIII.

The distribution of a given total of net migration among age groups is partly a reflection of past levels of net migration in each age group. The very heavy emigration from the cohorts then aged 15-24 during

³⁹Other specifications were tried to try to allow for any interaction between the rate of natural increase and the unemployment rate, but none of these nonlinear specifications represented an improvement over the linear equation in terms of the estimated results.

⁴⁰The changing age distribution of emigration, and its implications for demographic forecasting, has been commented on by Garret FitzGerald, *Irish Times*, 3/4/1968.

the period 1951-1961 would be expected to reduce the percentage of total net emigration occurring in the cohorts aged 20-29 during the 1961-1966 period. This, however, does not account for the sustained high emigration rate among those aged 15-24 between 1961 and 1966. Migration in this age group is crucially sensitive to the ability of the economy to absorb the increasing Irish reproduction rate, and in these age groups the impact of the post-war rise in nuptiality is already being felt. The magnitude of this impact is increased because of the depletion of these age groups by the heavy emigration of the late 1950's.

Table 14 presents some estimated regression

results for net migration by county, sex and age group. The age groups 15-19 and 20-24 have both been treated separately and aggregated, in order to see whether the labour market adjustment mechanism is best discussed in terms of a common or separated labour market for these two age groups.

OLS estimation techniques have been used to obtain estimates of the parameters. All the variables used as regressors in this equation are measured at the start of the period and are thus predetermined. The OLS estimates will therefore be consistent and unbiased and under the assumption of a normally distributed stochastic term, e , the usual probability tests may be applied to these estimates.

TABLE 14: CROSS SECTION NET MIGRATION REGRESSION RESULTS 1961-1966
(Estimated Standard Errors in Parentheses)

Eq. No.	Dependent Variable	Independent Variables				R ²	S _e
		Constant	(s _{i-1} P _{i-1} - P _i)	Y/P	(U/U + E) ^{nf}		
	$\frac{s_{i-1}P_{i-1} - P_i}{s_{i-1}P_{i-1}}$		$s_{i-1}P_{i-1}$				
(1)	Males, 15-19	15.9638 (12.0552)	0.4748 (0.2239)	-0.0798 (0.0445)	0.3829 (0.3136)	0.440	4.10
(2)	Males, 20-24	-20.4884 (18.6462)	1.3844 (0.2083)	-0.0145 (0.0618)	0.0646 (0.3624)	0.800	4.69
(3)	Males, 15-24	-12.1866 (16.6006)	1.4127 (0.3028)	0.0376 (0.0512)	0.1237 (0.3169)	0.734	4.05
(4)	Males, 25-29	28.0683 (16.6134)	0.2206 (0.2018)	-0.1016 (0.0711)	-0.0016 (0.4692)	0.015	6.16
(5)	Females, 15-19	0.1673 (7.5259)	1.0398 (0.1066)	-0.0576 (0.0319)	0.5712 (0.6735)	0.851	3.52
(6)	Females, 20-24	8.4560 (12.4882)	1.1008 (0.1212)	-0.1265 (0.0456)	0.7135 (0.8091)	0.882	4.26
(7)	Females, 15-24	-2.1515 (7.7297)	1.1802 (0.0994)	-0.0728 (0.0292)	0.5653 (0.5569)	0.905	2.93
(8)	Females, 25-29	17.8814 (8.6918)	0.2908 (0.1282)	-0.0910 (0.0430)	0.5886 (0.9297)	0.153	4.90

Correlation Coefficients		
Age Group	Males	Females
15-19 (U/U + E) ^{nf} Y/P	(s _{i-1} P _{i-1} - P _i)/s _{i-1} P _{i-1} 0.30	(s _{i-1} P _{i-1} - P _i)/s _{i-1} P _{i-1} 0.05
20-24 (U/M + E) ^{nf} Y/P	-0.33 0.56	-0.36 -0.12
15-24 (U/M + E) ^{nf} Y/P	-0.73 0.58	-0.62 -0.03
25-29 (U/U + E) ^{nf} Y/P	-0.71 -0.19 0.42	-0.53 0.08 0.29

Data in Appendix

(U/U + E)^{nf}
Y/P Males 0.63 Females 0.18

RESIDUALS FROM SOME OF THE EQUATIONS OF

TABLE 14

(Observed *minus* predicted values)

County	(1) Males 15-19	(2) Males 20-24	(5) Females 15-19	(6) Females 20-24
Carlow ..	2.87	6.52	3.99	-1.29
Dublin ..	-9.28	-6.37	-3.94	-2.82
Kildare ..	-3.80	6.43	-5.84	-0.74
Kilkenny ..	8.40	-2.19	6.01	0.23
Laois ..	5.22	0.84	5.75	5.18
Longford ..	-0.93	2.19	1.99	-0.68
Louth ..	-3.57	-5.95	-1.76	-3.93
Meath ..	-0.06	-6.66	-0.58	-3.67
Offaly ..	3.25	4.39	0.58	0.13
Westmeath ..	3.70	-1.94	-0.94	3.93
Wexford ..	1.83	1.68	2.11	-0.62
Wicklow ..	-3.22	-6.93	-2.06	-0.07
Clare ..	-4.98	-9.15	-6.29	-12.51
Cork ..	-3.70	0.10	-0.66	1.65
Kerry ..	-1.64	-1.53	0.63	-0.86
Limerick ..	-2.91	-3.97	-2.79	-4.36
Tipperary N.	-0.86	3.31	0.65	-0.29
Tipperary S.	6.64	3.49	-3.98	6.65
Waterford ..	-2.02	3.51	5.75	0.46
Galway ..	-0.00	-1.84	0.59	-0.96
Leitrim ..	4.81	5.00	-1.29	7.81
Mayo ..	-0.37	-1.56	2.16	2.27
Roscommon ..	2.03	3.76	4.04	-0.66
Sligo ..	-1.10	5.86	-3.12	5.20
Cavan ..	0.64	0.43	-1.03	-2.80
Donegal ..	-1.25	-0.54	0.89	-0.29
Monaghan ..	0.29	1.15	-0.86	3.09

The estimated equations show that the natural increase variable is an important influence on net migration for males aged between 15 and 24 and for females aged between 15 and 29. This association is especially close in the 20-24 age group for males and in the 15-19 and 20-24 or combined 15-24 age groups for females. The coefficients of the natural increase variables in equations (2), (3), (5), (6) and (7) suggest that in these sex and age groups any deviation from the average in natural increase adds or subtracts at least one person from the level of net migration, holding income and unemployment constant. In these equations the labour market adjustment model of migration seems to fit the facts rather well and the regional pattern of net migration is largely a product of the regional variations in natural increase. Since there was net emigration from the country over the period 1961-1966, its level must also be taken as a response to the level of domestic natural increase, given the overall expansion of domestic employment opportunities. The results recorded in Table 14 show that within the country there is no tendency for those areas where employment is expanding most rapidly to be also the areas where natural increase is greatest; rather the contrary is the case, and a state of disequilibrium characterises the regional supply and demand for labour.

In the age groups 25-29 for males net migration has ceased to be associated with natural increase,

presumably the adjustment of the younger age groups by the heavy emigration of the 1950's rendered further net emigration unnecessary. For women, however, there is still a statistically significant association between natural increase and net migration in this age group, although the coefficient of the natural increase variable is greatly reduced from its level in the equations for the younger age groups.

The income variable is not a statistically significant influence on net migration in any of the estimated equations for males. For the age groups 20-24 and 15-24 the estimated standard error of the natural increase coefficient may be raised due to the fairly high correlation between the income and natural increase variables in these age groups. On the whole, however, it seems clear that women's migration is more sensitive to purely economic and demographic considerations than men's: the R^2 is substantially higher in each age group for women than for men and the income variable is statistically significant for women aged 20-29, whereas it is never significant for men. It is interesting that the R^2 for the combined 15-24 age groups among women was higher than either R^2 of the separate groups, whereas the reverse was true among men. This may reflect the greater sensitivity of women to labour market forces, since it is probably more logical to treat the 15-24 age group as one labour market than to deal with its components separately.

One possible explanation of the relative insensitivity of males to economic forces is the greater importance that the prospect of inheriting a farm may have in their migration decision compared with the females. It is also true that the low income areas in Ireland are areas of sparse population, much of it engaged in agriculture, and these conditions do not improve a woman's marriage prospects: the woman's greater awareness of these factors may show up in our results in the form of a significant coefficient for the income variable. It is interesting to note that women have in general been found to be more willing to move in search of economic and social opportunity and that this is not merely an Irish phenomenon.⁴¹

The unemployment rate variable's coefficient is non-significant throughout Table 14, although in all cases it is of the expected sign. An age-specific unemployment variable might have performed better as a measure of labour market conditions at the start of the period in each age group, but, as mentioned above, this was unobtainable.

Comparing the results for the 15-24 age groups with those for the 25-29 group there seems to be

⁴¹Cf. OECD, *Documentation in Agriculture and Food, Geographic and Occupational Mobility of Rural Manpower*, (Paris 1965), p. 36.

much more random movement in the older age group, for which the specified model explains little of the variance in the dependent variable for either males or females. It is also clear that for males aged 15-19 a fairly high percentage of the variation in net migration remains unexplained. No doubt excluded variables, as well as the random element in the migration decision, have an important influence on net migration. If an important common influence has been excluded from the specification, we should expect the residuals from each equation of the estimated model to display a similar pattern, since the disturbances of which they are estimates would vary systematically. A simple test of this hypothesis is provided by the calculations of the correlation coefficients between the residuals of the estimated equations of Table 13, (age groups 15-24, 25-29 omitted):

Equation Number	(1)	(2)	(5)	(6)
(2)	0.43†	1.00	0.28	0.59*
(5)	0.51*	0.28	1.00	0.25
(6)	0.56*	0.59*	0.25	1.00

*=significantly different from zero, 99 per cent confidence level.

†=significant, 95 per cent confidence level.

It may be seen that most of the correlation coefficients are significant, and that the highest correlations occur between residuals from the equations for the same age groups. Thus some common influence on net migration has been omitted. Inspection showed no relationship between the educational attainment of a county (as measured by the percentage of its population aged over 15 classified as "at school") and the residuals from the equations. Such factors as knowledge of job opportunities or the distance from the county to the migrants' destinations may explain some of the residuals, but no attempt has been made here to quantify these variables.

One striking aspect of the residuals from the estimated equations concerns the over-prediction of the net emigration from Counties Limerick and Clare: the residuals for these counties were negative in all 8 equations, and for four of the 8 equations the absolute values of the residuals for Clare were the largest recorded for the corresponding equations. (The equations in question are Males aged 20-24, Females aged 15-19, 20-24 and 25-29.) Undoubtedly this finding is a reflection of the demand for labour associated with the Shannon industrial complex, which is not typical of the labour market conditions prevalent elsewhere in Clare or Limerick. In all equations for Louth and in all but one equation for Dublin (namely, Females aged 25-29) net

emigration is overpredicted (or net immigration underpredicted). This tendency to underestimate the attraction of Dublin on the basis of the variables used might be attributed to the non-economic pull of the city. On the other hand, the measured level of unemployment may be inadequate as an index of the state of the labour market in these counties at the start of the period.

A further question may be elucidated in the light of the results recorded in Table 14. If the inter-county variations in migration rates over the period studied served primarily to offset variations in the rate of natural increase between counties, and if the response to the income and unemployment variables is generally undramatic and uncertain, does it follow that the poorer areas of the country are not in any danger of permanent "depopulation" through the migration process? It appears that Professor Meenan argued an affirmative answer to this question in his Minority Report to the Emigration Commission:

"Our emigration goes on from one generation to another because it creates the conditions in which a new generation can be reared. Some members of a family on the land will leave the holding, thus making it possible for the one who is left to marry and rear a family, some of whom will leave in their turn. A movement of this kind is self-perpetuating.

For that reason it will not necessarily lead to an unbroken decline in the number of people in the country: on the contrary it possibly creates the conditions in which it is possible to maintain a very high fertility rate. . . . Those who write of the 'vanishing Irish' do not look far below the surface or note the manner in which movements in the rate of emigration and in the vital rates are interconnected." (Paragraph 10.)

It is certainly true that if the factors held constant in the 1961-1966 cross-section migration study, and especially the rate of unemployment in the United Kingdom and the overall expansion of employment in Ireland, remain at this level into the future the fear of depopulation would be groundless. Net emigration in the age groups studied was larger than natural increase only in County Leitrim, so that an encouraging rise in population was generally recorded. However, even if the favourable economic climate of the 1961-1966 period were to continue into the future, it is clear from our results that a continued rise in nuptiality implies a steady rise in emigration rates. (This is hinted at in the above quotation.) In addition, while the areas with heavy net emigration may not experience population decline, they will become progressively less important in terms of the percentage of the national

population living in them. Net emigration reflects a tendency to "export" the natural increase of the population aged 15-24, and this reduces the reproductive capacity of the total population in the immediate future. The following regression equation supports this view:

$$Y = 22.10 - 0.92X \quad R^2 = 0.53$$

(2.53) (0.17)

where Y = rate of natural increase in a county per 100 total population, 1961-1966.

X = average rate of net emigration in a county per 100 total population for the periods 1946-1951, 1951-1956, 1956-1961.

Thus when the rates are expressed in terms of total population, past rates of net emigration are inversely associated with current rates of natural increase.

As natural increase has risen in the post-war period it has also become progressively more concentrated geographically, and this concentration has proceeded at a more rapid pace than the concentration of total population. In 1966, for example, 42.3 per cent of the natural increase of the total Irish population occurred in Dublin, which contained only 27.6 per cent of the total population. At the same time, 52.7 per cent of the total natural increase occurred in urban areas which contained only 34.8 per cent of the population. At the other extreme, Leitrim experienced a natural decrease (excess of deaths over births) in 1966. If this pattern persists, the task of finding employment for Ireland's growing natural increase will become more and more a task of expanding employment opportunities in a few large population centres. As population becomes more concentrated in Dublin and a few other urban centres, it will become easier, at least during prosperous times, for these areas to absorb the excess natural increase of the rest of the country. During the period 1961-1966, however, Dublin (County and County Borough, and Dun Laoghaire) and Cork County Borough were the only areas of substantial net immigration in the 15-24 age groups and they absorbed relatively little of the natural increase of the rest of the county in these age groups. The following are the data on net migration by region for the age groups 15-24 over the period 1961-1966, in thousands: (urban areas = all of

Dublin + the three other County Boroughs) Even if the demand for labour in the urban areas were to continue to grow as rapidly as it has during the 1961-1966 period, it would be a long time before they could absorb all the excess natural increase of the rest of the country.

The main purpose of this section has been to establish a relationship between natural increase and net migration. Cross section data are detailed enough to allow us to study migration by age group. Concentrating on those age groups in which the impact of higher birth rates will first be felt, it was seen that there was in general a close association between the net migration rate and the rate of natural increase. It seems safe to project this association over time and to claim that the rate of net migration in the age groups 15-24 will be influenced by the upward trend in Irish reproduction rates documented earlier in the paper. The exact size of the coefficient connecting the natural increase and net migration variables over time cannot be inferred from the results of Table 14 since the estimation of the model on a cross section basis for the years 1961-1966 yields estimates of the structural parameters that reflect the conditions that prevailed over that period: in particular, they are influenced by the level of the unemployment rate in the United Kingdom and the rate of growth of employment in Ireland over the period.

C : Some Theoretical Considerations on the Relation Between Natural Increase, Employment and Net Migration in Ireland.

The evidence presented in the last two sections of this Part strongly support the view that Ireland's actual population growth is not very responsive to the level of natural increase in Ireland: emigration is the overriding determinant of whether the population grows or declines and at what rate it will change. A summary test of this contention shows that whereas 97 per cent of the variation in the annual changes in population between 1948 and 1966 is explained by a regression on emigration, only 36 per cent is explained by a regression on natural increase.

The various arguments in the debate concerning the effects of population growth on growth in income per person are thus irrelevant to the Irish situation: population growth in Ireland occurs only when the level of emigration falls to a level lower than the level of natural increase, and this occurs only if the United

Area	Males	Females	Total	Area	Males	Females	Total
Dublin	+1.6	+5.4	+7.0	All Urban	+3.5	+8.0	+11.5
Rest of Ireland	-41.3	-42.2	-83.5	Rest of Ireland	-43.2	-44.8	-88.0

Kingdom unemployment rate climbs to a very high level or the Irish unemployment rate falls to a very low level or both. Thus Irish population growth is a consequence of either domestic prosperity or British adversity, but in no way a cause of Irish prosperity in the short run.

It might, however, be argued that rising levels of Irish natural increase will in the future create their own demand for labour and thus establish a closer link between natural increase and population growth than has existed up to now. There are two possible theoretical approaches to this question. The first concentrates on what may be called a neo-classical wage-employment effect: assuming no technical change, as the number of potential labour market entrants rises, the wage rate is depressed and the demand for labour expands due to a substitution of labour for other factors of production and the expansion of output following the reduction in labour costs. A rising profit rate on investment in Ireland attracts an increased inflow of foreign capital to the country, until eventually equilibrium is restored at a real wage rate no lower than the initial rate, but at a higher level of employment. If economies of scale exist to any significant extent, the final level of real wages could be higher than the initial. This, in outline, is one argument that would suggest that natural increase creates its own demand for labour. Whatever the relevance of this argument in other countries, and its realism in any situation is seriously questioned due to the downward rigidity of wage rates, it seems unlikely that it would apply in the Irish context. So long as reasonably high levels of demand for labour exist in the United Kingdom, emigration from Ireland is likely to rise in response to rising Irish unemployment or a falling ratio of Irish to United Kingdom wages. This readiness to migrate whenever the demand for labour in Ireland is slack rules out the operation of the neo-classical wage-employment effect as a mechanism for converting Irish natural increase into employment in Ireland. Only in the face of massive unemployment in the United Kingdom and a weakening of union power to maintain relative wage rates is there any likelihood of an important effect on aggregate employment in Ireland through the impact on wages of the growing Irish natural increase.

A second possible mechanism linking rising natural increase and the level of employment is the effect of higher birth rates on aggregate demand. An example of the working of this sort of mechanism is the United States experience in the 1930's, when the depression was commonly supposed to have been aggravated by the fall in marriage and birth rates it induced. In the present-day Irish situation, the savings ratio is more likely to be the operative

constraint on growth in income per person, and rising marriage rates seem *a priori* more likely to exert downward pressure on this ratio than to help raise it. Hajnal has drawn attention to the higher savings ratio facilitated by modern Europe's late average age at marriage.⁴² The large percentage of Ireland's population in the young dependent age groups is probably a contributing factor to the prevailing low savings ratio, and as nuptiality rises this percentage will probably also rise, especially if the fertility of marriages does not fall. Strictly speaking, much of the expenditure undertaken consequent to marriage is investment, although it may be classified as consumption by the national income accountants: outlays on child rearing and education are an important example of this. However, the benefits to the Irish economy from these expenditures will be substantially lost if the children on whom they are spent subsequently emigrate. Perhaps the most optimistic prediction about the net effect of higher Irish nuptiality on the level of aggregate demand would look for a change in the composition of consumption outlays without much change in their percentage share in national income.

A final consideration in connection with the economic effects of higher nuptiality concerns changes in motivation and the supply of entrepreneurship that it might induce. In as much as "giving hostages to fortune" may increase incentive and remove inertia, the higher marriage rates will have an unqualifiedly beneficial effect on the economy. In addition, the reality or expectation of population growth may encourage new investment in the country. These consequences of the present demographic transition may, in the long run, be the most important, although it is hard to quantify them or to assess whether they will be strong enough to outweigh the possible adverse effects outlined earlier.

The arguments of this Part may be summarised by presenting a model, some of whose assumptions have been supported empirically by the evidence discussed here. In Figure I, let S_t = the supply function of labour in the Irish non-agricultural sector in time period t ; D_t = the demand function for labour, w_t = the equilibrium or market-clearing wage rate in period t ; \bar{w}_t = the wage rate that is established in period t . Normally, $\bar{w}_t > w_t$ so that an excess supply of labour emerges in the period, as measured by the distance AB. \bar{w}_t is determined by the ability of unions to raise wage rates for their members and the acceptable gap between Irish and United Kingdom wages. The excess supply of labour in a period is absorbed by unemployment and emigration. S_t shifts over time as a function of

⁴²*Op. cit.*, p. 132.

the natural increase of the working age population, its level of emigration in the recent past and its changing participation in the labour force (it is assumed that none of the natural increase is absorbed into agricultural employment). Participation rates may respond to economic forces, as will be explored in Part VI. The natural increase of the working-age population reflects past levels of birth rates and net migration. The net effect of rising birth rates over time is to shift S_t to the right. D_t moves in accordance with more or less autonomous forces such as the strength of Ireland's export performance, the inflow of foreign capital, the supply of entrepreneurship, and the growth of labour productivity. For the most part, the forces behind the shifts in S_t over time are unrelated to those that influence the movements of D_t . If this reasoning is valid, then rising nuptiality, followed by rising birth

rates, will have the net effect of tending to widen the distance AB. The actual behaviour of AB over time cannot, however, be confidently predicted due to the uncertainty surrounding the future course of

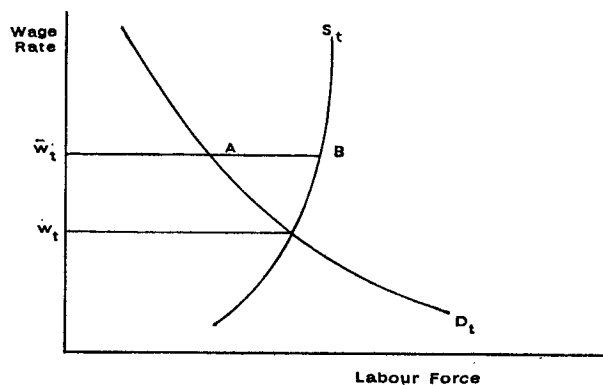


FIGURE 1

PART VI: SOME INFLUENCES ON IRISH PARTICIPATION RATES

The earlier sections of this paper have been concerned with the determinants of population growth in Ireland. The emphasis has been placed on the forces that determine the size of the working-age population and the level of unemployment and emigration. The connection between a given working-age population and the size of the labour force (that is, the sum of those employed and unemployed or the number "gainfully occupied") must now be studied in greater detail. Economists attach great importance to the fact that the percentage of the working-age population that is in the labour force (that is, the participation rate) may vary in response to changes in economic conditions. It is clear that any attempt to forecast the Irish labour supply should try to incorporate as much as may be learned about Irish participation rates.

No simple international comparison of participation rates can be provided due to the great difficulty of assessing the meaning of "gainfully occupied" in different countries. The 1964 *Demographic Yearbook* provides a large volume of international data on participation rates, but warns that in many instances these data are not comparable. The problem is most severe in connection with the treatment of unpaid family workers, especially the very young, the old and housewives. Little variation exists between countries in the percentage of the male population aged 14-65 that is gainfully occupied, but the variations in the percentages of married females and people of both sexes aged over 65 in the labour force are considerable. Ireland is not close to either extreme of the distribution of any of these percentages.

Despite the difficulties of making meaningful

comparisons between countries in this regard, it may be of interest to contrast the Irish and English participation rates. Although there is no justification for taking the English economy as a norm in this matter, it is convenient to use it as a basis of comparison that may help to pinpoint some of the special features of the Irish population's participation in the labour force. In 1961 60.8 per cent of the population (aged 15 and over) of England and Wales was classified as gainfully occupied, compared with 56.5 per cent of the corresponding Irish population. This aggregate difference may be examined in much greater detail by application of the following theoretical framework:

let O_i = the number gainfully occupied in the i th population category, P_i

O, P = total labour force and population, respectively, aged 15 and over,

primed symbols refer to the values for England and Wales, then

$$(O'/P')P - O = \sum_i (O'_i/P'_i) (P(P'_i/P') - P'_i) + \sum_i (P'_i(O'_i/P'_i) - O'_i)$$

$i = 1, \dots, 66$ population categories (11 age groups for each marital status and sex. Divorced added to married population for England and Wales.)

that is, the difference between the actual Irish labour force and the number that would be gainfully occupied if Ireland assumed the English aggregate

participation rate is equal to the sum of the differences in the labour forces due to the different age, sex and marital status structures of the two populations and to the different participation rates in specific categories in the two populations.

The following are the (1961) values for this identify:

$$(\text{in '000s}) +83.5 = -12.9 + 96.4$$

The net increase in the number gainfully occupied is due to the large number of additional members of the labour force that would result from the application of English sex, age and marital status specific participation rates to the Irish population. A relatively small reduction in the labour force results when the English distribution of population by individual categories is imposed on Ireland. More detailed information on how these changes would occur is provided in Table 15.

Examining the net effect of imposing the English population structure on Ireland, it is clear that the major change occurs as a result of the shift in both male and female population from the single to the married categories. Since married women have lower participation rates in each age group than

single women, the increased proportion of the female population that would be classified as married results in a fall of 29,000 in the female labour force. This illustrates a trend that may confidently be expected to occur in the immediate future in Ireland: as the percentage of the female population that is married rises, the aggregate female participation rate will fall. As is seen from the last column of the first part of Table 14, this effect will be concentrated in the 25-64 age groups. The reasons for the net increase in the male labour force participation rate as a consequence of assuming the English population structure lie principally in the shift of population from the single to the married status and from the 15-24 age groups. This is a shift to population categories with slightly higher participation rates, and results in an increase of 16,100 in the number of males in the labour force.

Although this exercise is limited to the imposition of the English population structure on Ireland, the general effects are more a reflection of Ireland's unusually low percentage of married people in the active age groups and the unusually old age structure of its population aged over 15 than of any peculiarity of the English population structure. The same general results would have been obtained for this

TABLE 15: COMPARISON OF ACTUAL IRISH LABOUR FORCE WITH THAT EXPECTED ON THE BASIS OF ENGLISH POPULATION STRUCTURE AND PARTICIPATION RATES

('000)

A: Changes due to Assumption of English Population Structure

Age	Males				Females				Total
	Single	Married	Widowed	Total	Single	Married	Widowed	Total	
15-24	-42.5	18.3	—	-24.2	-47.1	14.1	—	-32.7	-56.9
25-64	-134.9	182.9	-2.4	45.6	60.8	61.8	3.0	4.0	49.6
65+	-6.4	2.3	-1.2	5.3	-1.5	0.7	0.5	-0.3	-5.6
All Ages	-183.8	203.5	-3.6	16.1	-109.4	76.9	3.5	-29.0	-12.9

B: Changes due to Assumption of Specific English Participation Rates

Age	Males				Females				Total
	Single	Married	Widowed	Total	Single	Married	Widowed	Total	
15-24	13.1	—	—	13.1	23.7	5.9	—	29.6	42.7
25-64	-3.3	-0.7	0.4	-3.6	20.0	96.4	-1.1	115.3	111.7
65+	-12.1	-24.6	-6.7	-43.4	-5.2	0.1	-9.5	-14.6	-58.0
All Ages	-2.3	-25.3	-6.3	-33.9	38.5	102.4	-10.6	130.3	96.4

Data Sources: C.P., 1961, Vol. V, Tables 1, 5;
England and Wales, Census 1961, *Occupational Tables*, Table 3.

part of the comparison if any other European population structure had been the basis of the comparison.

The effects of the use of English specific population category participation rates on the Irish working-age population are considerable. The male labour force is reduced, mostly because of the much lower participation rates in England and Wales for males aged over 65. Surprisingly, perhaps, the number of males and females aged 15-24 gainfully occupied rises: no doubt the high English participation rates in these age groups reflects the comparatively small percentage of the population that receives post-primary education. The major impact of the English participation rates, however, is in the substantial increase in the number of women, and especially married women, classified as gainfully occupied. This increase is greatest among women aged 25-64. The desirability of attaining such high participation rates for married women is debatable from a social viewpoint, since it entails costs in terms of home duties, but it does seem likely that in the future Ireland will see higher percentages of its married female population entering the labour force, although the level of labour force participation attained by the English population may never be reached.

If Irish marriage rates continue to rise, the population's structure will change in a way that tends to reduce aggregate participation rates, while if emigration remains at low levels the age structure will change in a way that tends to raise aggregate participation rates; the net effect is likely to lower rates. On the other hand, a major increase in the participation rate could occur if Ireland's low participation rate for married women began to climb. The major source of change in participation rates in the future will be in the percentages of individual population categories that are gainfully occupied, and on the whole it seems as if these percentages are more likely to rise than to fall. It would be instructive to study the behaviour of these specific participation rates over time, but the population data available are detailed enough to facilitate this only for Census years. As an alternative to a time series study, the intercounty variations in participation rates may be studied and some information gained that may be relevant to their behaviour over time.

From Table 15 it was seen that the population categories in which change in participation rates is most likely are males aged 14-24 and over 65, females 14-24 and single, married and widowed females. This excludes only males aged 25-64 and the 1961 Census data show very little variation between counties in the participation rate of this population category.

As a first approach to the problem, two major forces may be postulated as explanations of the variations in participation rates by county. First, participation in the labour force may be expected to rise as the rate of unemployment falls: marginal members of the labour force cease to look for work and drop out of the labour force in the face of high unemployment rates. This "discouraged worker" hypothesis has been shown to have an important influence on the recorded labour force over time in the United States.⁴³ It is of interest to see whether this hypothesis can be substantiated for the Irish situation. Some time series evidence in support of this idea has already been presented in Part V, where it was seen that changes in participation rates occurred as unemployment changed. Although the cross-section data may measure a different type of behaviour than that measured by time series data, we may expect at least the direction of the influence of unemployment on participation to be the same in both situations.

A second influence on participation in the Irish labour force may be the level of industrialisation or independence from agriculture prevalent in a county: partly as a result of classification conventions and partly as a reflection of actual differences in the composition of the labour force, participation rates are likely to differ between the agricultural and non-agricultural communities. These differences will depend on the population category: one would expect that women are less likely to be classified as gainfully occupied if they live on farms, although their "home duties" may entail a considerable contribution to farm output; on the other hand, the old appear more likely to be counted in the labour force, and actually to be at work, in farming areas than elsewhere. Therefore, in addition to the unemployment rate, a variable measuring the extent of "industrialisation" in a county may be included in the determinants of labour force participation in Ireland.

The following model has been tested on the population categories specified above:

$$\frac{(U+E)_i}{P_i} = a_0 + a_1 \frac{(U+E)_i^{nf}}{(U+E)_i} + a_2 \frac{(U)_i^{nf}}{(U+E)_i^{nf}} + ei$$

where U_i = unemployment in the i th population category,

E_i = employment in the i th population category,

P_i = the number in the i th population category,

⁴³Cf. Thomas Dernburg and Kenneth Strand, "Hidden Unemployment 1953-1962: A Quantitative Analysis by Age and Sex," *American Economic Review*, LVI, 1, (March 1966), pp. 71-95.

nf superscript = non-family-farm employment, unemployment,
i = 1, ... 5 population categories: namely
 single females,
 married females,
 widowed females,
 males aged 14-24
 males aged over 64.

For the population categories "single females" and "males aged 14-24" the population has been defined as the non-school population in order to avoid confusion between the variation in school participation rates and labour force participation rates. The variation in school participation rates has been studied elsewhere, and ascribed mainly to variations in the supply of school places.⁴⁴

⁴⁴OEDC-Department of Education, *op. cit.*, Chapter 6.

TABLE 16: CROSS SECTION LABOUR FORCE PARTICIPATION RATES REGRESSION RESULTS 1961
 (Estimated Standard Errors in Parentheses)

Eq. No.	Dependent Variable (U + E)/P	Independent Variables			R ²	Se
		Constant	(U + E) ^{nf} /U + E	(U/U + E) ^{nf}		
(1)	Males, 14-24	95.5661 (2.4503)	0.0029 (0.0237)	-0.5640 (0.1139)	0.56	1.64
(2)	Males, 14-24	95.8353 (1.0310)		-0.5712 (0.0952)	0.57	1.61
(3)	Males, 65 and over	73.7877 (3.8527)	-0.5106 (0.0486)	-0.3562 (0.2701)	0.83	4.02
(4)	Males, 65 and over	69.1395 (1.5810)	-0.4800 (0.0433)		0.82	4.08
(5)	Females, single	-30.1476 (10.3870)	1.0570 (0.1136)	-0.6507 (0.6855)	0.77	3.67
(6)	Females, married	3.6326 (1.3046)	0.0252 (0.0143)	-0.1763 (0.1406)	0.09	0.75
(7)	Females, widowed	37.0215 (3.4557)	-0.2886 (0.0441)	0.1130 (0.7333)	0.61	3.91
(8)	Females, 14-24	-4.4283 (14.7575)	0.8073 (0.1545)	-0.6815 (0.8030)	0.50	4.29

Correlation Coefficients
 of Independent Variables

Males, 14-24 -0.52	Males, 65 + -0.48	Females, single 0.03	Females, married 0.01	Females, widowed 0.08
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Data in Appendix

The results of applying this model to the 1961 Census data by county are presented in Table 16. The model is not successful in explaining the variation in participation rates among married women. In fact there is little intercounty variation in participation rates in this population category and it appears that much of the existing variation may be attributable to non-economic forces. The influence of the unemployment rate is in the expected direction in all equations except that for widowed females; its influence is statistically significant, however, only

for males aged 14-24. In these estimated equations' unemployment data by sex and age were unavailable and the aggregate rate for the sex was used for each category in that sex. It is possible that if unemployment data were available for each category the influence of this variable would be significant for single females or males aged over 65. Although the cross-section coefficients may not be extrapolated over time it is safe to say that as the rate of unemployment falls the population's labour force participation rate will rise, due in particular to the increase in the

proportion of males aged 14-24 in the labour force. At present, males in this age group seem to drop out of the labour force, or fail to enter it, if unemployment in their county of residence is high.

The influence of the level of industrialisation, as measured by the percentage of all gainfully occupied in non-farm occupations, is not significant for males aged 14-24 or married females. In these categories the participation rate does not appear to vary between the farm and non-farm population. For males aged over 65 and single and widowed females, however, much of the intercounty variation in participation rates is attributable to the variation in the percentage of the labour force in non-farm occupations. Widowed females and males over 65 are more likely to be in the labour force if they are in agricultural occupations. This finding reflects the obvious tendency for old farmers or widows to classify themselves as gainfully occupied, and to continue to work, when their non-farm counterparts would have retired. It also accounts for the higher percentage of the Irish population in these categories gainfully occupied compared with the English population. For single females the situation is reversed: a single woman on a farm is apparently less likely to be classified as gainfully occupied than her counterpart in a non-farm situation. To some extent, no doubt, this reflects the greater availability of employment for single women in non-farm situations, but it may also reflect the classification bias in favour of calling the work performed by single women on farms "home duties" and thereby excluding the worker from the measured labour force. A further population category for women may be defined, namely, women aged 14-24, in order to see whether the conclusions for single women also apply to this category: the two categories overlap considerably, since 50.1 per cent. of all single gainfully occupied women were aged between 14 and 24. The final estimated equation in Table 16 shows that much the same forces influence the participation of women aged 14-24 and single women, except that the response of the former category to the level of industrialisation is similar. A more detailed study of participation rates by sex, age and marital status is not possible since county data are not published by age and marital status.

More information on the influence on participation, especially among females, might be obtained if a more refined index of 'industrialisation' were used—measuring the percentage of each labour force category in specific industrial groups. Data on industries by sex and age are not published, however, and the index of industrialisation that has been used is based on occupational, rather than industrial, data: for a farm-non-farm dichotomy the distinction between occupational and industrial classification is

less important than it would be for more detailed measures of 'industrialisation'.

The coefficients of the industrialisation variable may give some indication of the effect of the decline in agricultural employment on aggregate participation rates. The largest coefficient for this variable is associated with single females; the only sizeable negative coefficient is for males aged over 64. In view of the fact that industrialisation, in the sense this term is used here, will probably proceed more rapidly among single females than among males over 65, and that the share of single females in the total labour force is greater than that of males over 64, the results obtained here suggest that the net effect of the decline in the importance of agricultural occupations will be to raise the aggregate participation rate.

Table 16 presents separate regression equations, omitting the non-significant variable, for those equations in which one of the independent variables was non-significant in the original specification and the two independent variables were highly inter-correlated. This re-estimation does not materially alter the estimated regression slope of the remaining variable.

A final approach to the project of the course of Irish participation rates consists in a comparison of the 1961 and 1966 Census data by age, sex and marital status and an estimation of the change in the labour force between the two dates that is attributable to the changing composition of the population. The difference between this estimated change and the total actual change in the labour force may be attributed to the changing participation rates in specific population categories. Between 1961 and 1966 the total labour force rose by 13.4 thousand. The population aged over 14 rose by 40.3 thousand between the two dates. At the 1961 aggregate participation rate this would have implied an increase of 22.3 thousand in the number gainfully occupied. The model applied to the comparison of Ireland and England and Wales earlier in this Part may be used to determine the change in the labour force that may be attributed to the changed structure of the population aged over 14. Table 17 presents the results. The changing population structure accounted for a fall of 7.3 thousand in the labour force: this reduction is due to the effects of population redistribution that were predicted on the basis of the comparison with England: the principal impact has been due to the increased percentage of married women in the population, which, because of the lower participation rate for married compared with single women, led to a reduction of 7.0 thousand in the female labour force. The net result of the redistribution of the male working-age population is slight, although there was substantial transfer between categories with similar participation rates.

TABLE 17: ANALYSIS OF CHANGES IN IRISH LABOUR FORCE 1961-1966

('000)

Due to change in population size	+22.3
Due to changes in population structure	-7.3
Due to changes in participation rates	-1.6
Total	13.4

Changes due to difference in population structure:

Age	Males				Females				Total
	Single	Married	Widowed	Total	Single	Married	Widowed	Total	
14-24	12.7	3.9	—	16.6	8.7	0.5	—	9.2	25.8
25-64	-23.6	8.7	-2.1	-17.0	-15.9	0.2	-1.3	-17.0	-34.0
65+	0.1	1.4	-1.2	-0.1	0.5	0.1	0.2	0.8	0.9
All Ages	-11.0	14.0	-3.3	-0.3	-6.7	0.8	-1.1	-7.0	-7.3

Data sources: C.P. 1961, Vol. V, Table 1; 1966, Vol. II, Table 12; 1966, Vol. III, Table 1.

The calculations presented in Table 17 show that the net effect of changes in specific participation rates between 1961 and 1966 was a reduction of 1.7 thousand in the total labour force. This small reduction is somewhat surprising in view of the continued decline in agricultural occupations, and the slightly lower unemployment rate in 1966. It is possible that increased post-primary educational participation contributed to the change. A complete analysis of these trends must await the publication of 1966 employment data by age and sex.

Although this Part has been able to shed some light on the influences that affect the Irish population's participation in the labour force, one major gap is the absence of any information on the determinants of married females' participation rates. Compared with England and Wales, Ireland's

married females' participation in the labour force was seen to be very low. It is possible that if marriage fertility falls, this participation will rise, although this hypothesis remains untested.

The evidence presented here shows that Ireland's population structure will probably change in the future in a manner that will tend to lower the aggregate participation rate, but that if full employment is approached and as the role of agricultural occupations declines in importance, the rate should tend to rise due to changes in the participation rates in specific population categories. The net effect of these forces is uncertain, but it may be to raise the proportion of the working-age population that is in the labour force. If this should happen, then the labour supply would grow more rapidly than the working-age population.

CONCLUSION

This paper has re-examined Ireland's demographic patterns and discussed the probable consequences of current changes in these patterns. In concluding, it is appropriate to draw attention to some of the study's social and economic implications. Inevitably, a more personal note is introduced once the relatively objective analytical framework is left behind.

The two interrelated topics of birth rates and emigration have been the chief concern of the study. Irish birth rates were examined in some detail by separate consideration of marriage and fertility rates. The traditionally low level of Irish marriage rates was interpreted as an archaic method of population control, which has allowed the country to

maintain a high marriage fertility without the consequence of a high birth rate. This demographic pattern—low marriage rates, high marriage fertility—entails considerable social costs, some of which have been documented in the present study. The high percentage of the Irish population that is single is generally regarded as an unfavourable aspect of Irish society; this study has drawn attention to the mental health advantage enjoyed by the married population. The large average family size prevalent in Ireland has meant that, from the viewpoint of the individual family, marriage entails unusually heavy economic burdens. Little is known about the advantages and disadvantages of large families for

the quality of Irish married life and more research in this area is called for. From a national viewpoint, the high Irish fertility has contributed to the economy's heavy burden of young dependency. As marriage rates continue to rise, probably faster than fertility falls, the percentage of young people in the population will continue to rise, increasing the difficulty of achieving higher standards and participation rates in education.

An important finding of the study was the extent to which the poorer segments of Irish society bear the burden of the country's abnormal demographic patterns. Average family size is largest in the rural and poorer urban classes. Marriage levels are lowest in these same classes. For the married population in these classes the economic burden of marriage is therefore heavy not only because of their low income but also because of their relatively large families. On the other hand, the highest levels of bachelorhood and spinsterhood are found in these classes, which implies that the people most likely to have to face the psychological adjustments entailed in remaining single are drawn disproportionately from the lower socioeconomic groups.

Ireland faces the prospect of rising birth rates as marriage levels rise at a rate faster than the decline in marriage fertility. This raises the question of what impact these changes will have on the level of emigration. Two important findings are relevant to this question: in the first place, emigration was shown to be very responsive to the ratio of Irish to United Kingdom wages; secondly, the level of natural increase in Ireland was seen to have more effect on the level of emigration than on the level of population growth. Assuming reasonably full employment in the United Kingdom, emigration from Ireland will remain low only if Irish wages

increase rapidly. If rising wage levels are not to result in price increases that would undermine Ireland's competitive position in world markets, productivity must rise rapidly. With rapidly rising productivity, a very fast rate of increase in sales (much of it dependent upon the expansion of exports) is required if anything more than a small percentage of Ireland's high rate of natural increase is to find employment in the country. Realistic economic planning in Ireland must accept that, over the range of years for which forecasts have any claim to credence, the goal of full employment can be approached only on the condition that emigration will exceed the increase in total employment in the country. Given present demographic trends, it will be a long time before Ireland ceases to be a labour surplus area.

Recognition of the fundamental role of emigration in the Irish labour market has important implications for Irish educational and manpower policies. Planning for full employment should consider those whose employment will occur outside Ireland, since their emigration is inherent in the assumption that Ireland can attain full employment and their welfare must not be ignored in an evaluation of Irish economic performance.

Throughout this study, attention has been directed to consequences of various demographic patterns for the Irish economy and society. Some of the economic consequences of the peculiarly Irish combination of high fertility and low marriage rates have been discussed in detail, while other topics connected with social and psychological aspects of this subject have been only introduced. There is room for much additional work in this area, since it is important that these topics be thoroughly researched.

Appendices

CROSS SECTION DATA

NET MIGRATION RATE

1961-66

	Males				Females			
	15-19	20-24	15-24	25-29	15-19	20-24	15-24	25-29
Carlow	16.7	27.6	21.4	9.8	23.5	23.3	23.4	-0.5
Dublin	-1.3	-4.8	-2.8	-2.7	-12.0	-4.6	-8.3	5.6
Kildare	2.4	22.8	11.9	21.9	14.5	19.2	16.4	-1.8
Kilkenny	17.1	31.1	23.5	13.8	23.5	30.2	26.3	2.8
Laois	15.4	27.2	20.8	14.2	25.3	28.7	26.7	5.6
Longford	20.4	38.2	27.9	7.5	27.7	44.1	34.3	5.1
Louth	9.4	18.7	13.6	2.1	6.3	12.8	9.3	8.0
Meath	8.5	24.2	15.5	8.1	15.9	27.4	20.8	-6.0
Offaly	13.1	31.7	21.6	17.2	19.3	29.9	23.7	-5.0
Westmeath	16.8	30.7	22.9	10.6	15.1	33.5	23.0	3.6
Wexford	17.1	25.8	20.9	6.9	23.4	27.1	24.9	4.9
Wicklow	8.6	17.5	12.5	3.3	10.5	18.2	13.9	3.8
Clare	11.8	27.4	18.7	1.9	15.8	31.8	22.5	-14.3
Cork	7.3	17.5	11.9	4.2	8.7	17.3	12.6	2.0
Kerry	14.9	36.6	24.8	12.2	19.6	39.9	28.3	4.5
Limerick	12.4	23.2	17.1	1.7	13.4	21.8	17.1	-0.4
Tipperary N.	12.4	24.2	17.6	12.0	17.3	26.9	21.4	3.8
Tipperary S.	20.3	36.2	27.2	10.9	23.7	34.9	28.1	2.0
Waterford	8.0	20.0	13.4	2.7	11.6	21.4	16.1	4.2
Galway	13.8	33.9	22.9	13.8	15.6	36.3	24.6	5.9
Leitrim	19.4	44.8	31.1	14.8	31.4	47.1	37.5	9.0
Mayo	17.8	46.1	30.3	20.2	22.1	53.0	35.3	7.1
Roscommon	17.3	40.4	27.4	14.5	24.7	49.4	35.1	-2.0
Sligo	17.5	39.1	26.7	15.4	18.3	41.9	28.2	5.2
Cavan	19.8	33.2	25.6	12.3	27.9	37.4	31.6	1.5
Donegal	19.1	38.1	27.6	17.8	19.2	40.7	28.6	12.3
Monaghan	13.9	34.1	23.1	10.8	21.7	32.6	26.2	6.6

RATE OF NATURAL INCREASE

(1961-66)

	Males				Females			
	15-19	20-24	15-24	25-29	15-19	20-24	15-24	25-29
Carlow	23.3	31.8	27.0	11.6	27.4	35.7	30.9	-2.4
Dublin	17.6	18.1	17.8	11.2	1.7	13.5	7.6	13.3
Kildare	12.3	28.7	20.0	26.3	29.5	33.6	31.2	9.5
Kilkenny	15.0	40.8	26.8	6.9	26.4	41.9	33.0	-3.7
Laois	15.6	35.6	24.7	8.9	27.2	33.9	30.0	-5.5
Longford	27.9	41.9	33.8	3.9	32.0	50.2	39.4	-12.9
Louth	17.2	34.1	24.9	11.8	16.2	26.6	20.9	7.7
Meath	14.5	39.0	27.7	13.3	25.4	43.0	32.9	-6.7
Offaly	15.2	36.3	24.9	9.2	27.1	40.2	32.6	-3.2
Westmeath	21.1	40.1	29.5	3.0	24.6	40.3	31.4	-2.9
Wexford	21.6	33.7	26.9	16.1	27.8	35.5	31.0	4.3
Wicklow	18.9	34.2	25.7	10.6	21.0	29.7	24.9	9.4
Clare	20.3	42.4	30.1	2.7	27.9	48.9	36.6	-5.8
Cork	16.9	29.1	22.4	7.3	18.0	27.2	22.2	4.2
Kerry	15.5	43.3	28.2	6.1	25.4	46.6	34.4	-1.7
Limerick	23.1	36.0	28.7	8.9	23.8	36.1	29.1	4.3
Tipperary N.	21.1	31.6	25.7	7.5	23.8	36.9	29.5	-3.0
Tipperary S.	23.0	40.2	30.5	5.1	35.7	39.4	37.2	-1.7
Waterford	17.3	28.6	22.4	8.0	15.6	34.1	24.1	-1.3
Galway	17.0	42.0	28.3	14.3	22.5	44.7	32.2	3.3
Leitrim	14.8	44.7	28.5	-6.7	37.3	43.4	39.6	-3.4
Mayo	21.2	50.3	34.0	8.6	25.3	53.4	37.3	-1.3
Roscommon	21.1	42.7	30.6	3.1	26.9	54.7	38.6	-21.0
Sligo	25.6	40.1	31.8	3.0	28.0	43.0	34.3	3.0
Cavan	24.1	39.6	30.8	-0.4	34.3	44.8	38.5	-15.5
Donegal	19.2	43.4	30.0	15.0	22.5	43.1	31.5	9.1
Monaghan	16.9	40.0	27.4	-4.5	29.0	36.6	32.1	-5.8

PERCENTAGE OF NON-FARM LABOUR FORCE
UNEMPLOYED

	Males	Females
Carlow	10.4	5.67
Dublin	5.5	5.80
Kildare	6.6	4.52
Kilkenny	8.1	4.35
Laois	8.1	4.99
Longford	14.9	3.61
Louth	8.4	2.48
Meath	9.0	4.72
Offaly	6.9	3.32
Westmeath	8.9	3.59
Wexford	10.0	5.04
Wicklow	8.1	3.94
Clare	11.8	4.43
Cork	7.6	3.41
Kerry	18.6	4.24
Limerick	12.2	5.30
Tipperary N.	11.0	6.92
Tipperary S.	9.7	4.56
Waterford	8.5	3.55
Galway	10.4	2.98
Leitrim	12.9	5.88
Mayo	11.4	4.00
Roscommon	7.5	4.06
Sligo	10.6	3.39
Cavan	12.7	4.46
Donegal	19.6	6.23
Monaghan	9.4	4.07

NATURAL INCREASE 1961-1966 PER 1,000 TOTAL
POPULATION

Carlow	13.7
Dublin	15.5
Kildare	14.5
Kilkenny	6.9
Laois	10.5
Longford	5.7
Louth	13.0
Meath	10.8
Offaly	12.4
Westmeath	12.4
Wexford	9.8
Wicklow	10.8
Clare	6.0
Cork	9.4
Kerry	4.8
Limerick	10.9
Tipperary N.	8.8
Tipperary S.	9.7
Waterford	9.5
Galway	8.5
Leitrim	1.0
Mayo	4.0
Roscommon	1.3
Sligo	4.0
Cavan	4.5
Donegal	5.5
Monaghan	7.1

PERSONAL INCOME PER PERSON

Carlow	£ 215
Dublin	231
Kildare	227
Kilkenny	219
Laois	204
Longford	170
Louth	180
Meath	222
Offaly	200
Westmeath	204
Wexford	185
Wicklow	203
Clare	167
Cork	199
Kerry	174
Limerick	204
Tipperary N.	212
Tipperary S.	212
Waterford	218
Galway	178
Leitrim	167
Mayo	153
Roscommon	170
Sligo	170
Cavan	164
Donegal	153
Monaghan	175

NET MIGRATION 1946-1961 PER 1,000 TOTAL
POPULATION

Carlow	12.8
Dublin	8.4
Kildare	14.2
Kilkenny	13.3
Laois	14.3
Longford	18.1
Louth	10.2
Meath	10.5
Offaly	12.9
Westmeath	13.7
Wexford	14.7
Wicklow	12.7
Clare	15.6
Cork	9.7
Kerry	15.6
Limerick	15.2
Tipperary N.	14.2
Tipperary S.	15.9
Waterford	11.7
Galway	15.6
Leitrim	21.5
Mayo	18.2
Roscommon	16.6
Sligo	14.8
Cavan	18.4
Donegal	17.6
Monaghan	19.8

LABOUR FORCE PARTICIPATION RATES

	Males		Females			
	14-24	65 and over	14-24	Single	Married	Widowed
Carlow	90.1	49.8	63.6	57.5	4.0	27.0
Dublin	93.5	34.1	83.4	81.6	6.2	17.8
Kildare	90.4	46.7	66.1	65.0	3.9	22.5
Kilkenny	91.6	52.2	65.1	56.9	4.4	28.8
Laois	89.5	53.0	64.1	54.8	4.0	33.8
Longford	86.5	60.1	61.8	54.2	4.0	30.2
Louth	89.5	40.0	82.9	74.2	7.2	22.5
Meath	91.0	54.6	70.3	62.1	4.7	33.6
Offaly	91.9	56.0	68.1	60.6	5.7	33.9
Westmeath	87.9	52.7	66.3	60.1	4.2	33.4
Wexford	90.2	48.6	61.4	55.6	4.1	26.9
Wicklow	91.7	42.7	71.2	67.0	5.3	22.0
Clare	89.0	57.7	62.7	51.5	4.2	32.6
Cork	93.2	43.8	73.6	63.0	4.8	20.7
Kerry	86.8	47.7	61.0	50.3	4.2	26.4
Limerick	90.4	47.3	68.6	62.1	4.6	25.0
Tipperary N.	93.6	55.3	68.2	58.3	4.5	30.7
Tipperary S.	90.0	49.1	63.3	57.5	5.1	27.8
Waterford	92.3	41.0	71.6	65.2	5.2	19.9
Galway	89.6	68.8	61.7	55.0	4.7	39.1
Leitrim	90.9	70.1	61.6	51.3	4.9	40.1
Mayo	87.1	68.5	59.3	50.8	5.2	37.9
Roscommon	90.9	70.1	61.3	48.6	4.7	37.9
Sligo	90.8	62.2	67.1	55.6	5.0	31.4
Cavan	88.5	64.3	61.6	53.1	4.5	36.2
Donegal	81.9	59.5	62.0	49.4	5.6	25.9
Monaghan	89.5	60.2	66.5	55.1	6.1	35.0

PERCENTAGE OF LABOUR FORCE IN NON-FARM OCCUPATIONS

	Males		Females			
	14-24	65 and over	14-24	Single	Married	Widowed
Carlow	78.2	38.2	94.2	89.3	82.3	23.7
Dublin	99.2	95.0	100.0	99.8	99.7	96.6
Kildare	88.2	49.2	97.2	93.9	87.2	36.3
Kilkenny	70.9	32.9	92.9	86.9	79.2	24.5
Laois	66.5	28.7	92.7	86.9	70.0	17.7
Longford	57.2	15.4	88.7	81.4	74.7	18.4
Louth	91.3	52.8	99.2	96.1	96.4	46.1
Meath	76.8	32.1	96.9	90.1	75.8	21.5
Offaly	75.7	28.7	94.4	86.8	84.5	19.0
Westmeath	75.4	26.8	96.0	88.7	82.7	22.8
Wexford	73.3	38.1	91.9	86.2	76.5	25.7
Wicklow	85.1	46.1	97.4	94.5	91.0	48.9
Clare	50.6	18.7	83.6	79.2	78.8	20.6
Cork	77.7	45.3	93.2	91.8	89.0	43.3
Kerry	54.9	27.5	84.9	82.0	84.2	25.2
Limerick	78.0	44.7	94.6	90.6	88.8	37.4
Tipperary N.	64.9	31.1	90.4	84.8	80.4	26.0
Tipperary S.	72.6	36.8	93.2	87.9	82.1	29.9
Waterford	83.7	52.3	96.8	94.1	89.1	39.9
Galway	46.4	14.0	85.4	82.1	69.4	17.4
Leitrim	39.8	11.2	80.1	75.2	66.5	9.5
Mayo	42.4	9.9	82.7	77.7	58.4	12.9
Roscommon	42.3	9.7	83.1	75.7	58.0	12.7
Sligo	60.0	16.6	90.6	83.9	70.8	16.0
Cavan	51.7	15.3	87.0	78.9	72.5	13.1
Donegal	60.3	20.1	93.1	87.9	82.5	20.2
Monaghan	60.1	18.4	90.9	82.7	71.8	16.5

TIME SERIES DATA

Year	M '000	U _n %	U _{uk} %	W/W _{uk} (53=100)	U _s %	ΔP '000	Natural Increase '000	M ₀ '000
1948	25.6	9.4	1.50	102.1		4	29.6	9.8
1949	34.1	9.0	1.52	101.2		-8	26.1	7.3
1950	35.8	7.5	1.53	100.7		-10	25.8	4.6
1951	30.5	7.3	1.19	100.7	4.8	-10	20.5	4.2
1952	35.5	9.1	1.99	99.4	5.5	-6	29.5	4.6
1953	34.0	9.6	1.64	100.0	7.5	-6	28.0	6.1
1954	41.0	8.1	1.34	96.9	6.6	-14	27.0	6.2
1955	46.9	6.8	1.08	93.6	6.3	-22	24.9	5.7
1956	44.8	7.7	1.19	92.2	7.1	-18	26.8	7.6
1957	48.9	9.2	1.43	88.6	7.8	-22	26.9	13.6
1958	45.3	8.6	2.10	90.2	7.5	-20	25.3	7.9
1959	35.9	8.0	2.17	90.0	7.5	-10	25.9	7.1
1960	42.1	6.7	1.62	90.3	6.8	-14	28.1	7.0
1961	29.1	5.7	1.52	89.5	6.2	-4	25.1	5.7
1962	16.9	5.7	2.03	96.2	5.4	11	27.9	5.5
1963	16.5	6.1	2.50	97.3	6.7	13	27.5	6.1
1964	15.4	5.7	1.66	101.1	6.6	16	31.4	5.8
1965	17.5	5.6	1.42	96.5	6.9	13	30.5	5.1

Year	ΔEn	ΔUn	ΔU _s	ΔE _s	M
All variables in thousands					
1951-52	-7.9	10.9	1.4	-14.2	35
1952-53	-5.0	3.4	11.5	-24.0	33
1953-54	3.0	-4.9	-7.3	-6.0	36
1954-55	-7.0	-2.6	-1.4	-10.0	45
1955-56	-9.0	-2.5	1.8	-12.0	48
1956-57	-25.0	10.8	2.8	-16.0	41
1957-58	-9.0	-4.6	-2.3	-7.0	58
1958-59	1.0	-3.4	-1.9	-9.0	32
1959-60	3.0	-4.7	-2.3	-8.0	41
1960-61	8.8	-5.0	-4.5	-11.3	40
1961-62	16.2	1.4	-0.8	-8.7	20
1962-63	13.0	3.2	1.0	-7.0	12
1963-64	14.0	-2.2	-0.5	-11.0	22
1964-65	12.0	1.1	1.1	-14.0	7
1965-66	3.7	6.4			

DATA SOURCES

Time Series

- M** = net migration. Estimated mid-year population data published in S.A. (latest revisions available used), adjusted to a January-to-January basis by averaging adjacent values. In the equation on page 69, the migration figures used are from mid-year to mid-year and are based on the estimated mid-year population and the average of adjacent natural increase figures.
- U_n** = non-agricultural unemployment. Annual average figure from the T.E.U., excluding agricultural occupations and domestic servants, expressed as percentage of insured labour force. The actual level of this variable is used in the equation on p. 69 on an April-to-April change basis.
- U_a** = agricultural unemployment. The level of this variable is obtained as the difference between total registered Live Register and U_n converted to a percentage basis by use of the data on total agricultural employment published for each year since 1951 in *Economic Statistics* and T.E.U.
- U_{uk}** = percentage unemployment in the United Kingdom. OHerlihy's series updated (cf. *op. cit.*, p. 39).
- W/W_{uk}** = ratio of money wage rate in Irish manufacturing sector to U.K. money wage rate. OHerlihy's series updated (cf. *loc. cit.*).
- E_n** = number employed in non-agricultural occupations in Ireland: April figures published in *Economic Statistics* and T.E.U. since 1951.
- E_a** = number employed in agricultural occupations, same source as E_n.

Cross Section

- M_o** = new passports issued to persons going to employment or permanent residence "overseas." Published annually in S.A.; data before 1952 in *Emigration Commission*, Table 96.
- P_i** = population in specific sex and age groups in 1961. C.P. 1961, Volume II, Table 12.
- P'_i** = population in specific sex and age groups in 1966, C.P. 1966, Volume II, Table 15.
- si** = probability of survival between five year age groups, by sex. Irish Life Table Number 6, published in *Irish Statistical Bulletin*, June 1965.
- U** = percentage unemployed, male and female labour force, 1961. Number recorded as "out of work" in C.P. 1961, Volume IV, Table 10; total non-family-farm labour force used as denominator.
- Y/P** = personal income per person, from Attwood and Geary, *op. cit.*, Table 12.
- Natural Increase 1961-1966: C.P., 1966, Vol. I, Table 4, (expressed per 100 total population).
- Net Migration Rate, 1946-1961: Unweighted average of net migration rates 1946-1951, 1951-1956, 1956-1961. From C.P. 1946 and 1951, *General Report*, Table 19; C.P. 1956, Volume I, Table 12; C.P. 1961, Volume I, Table 12.
- U + E/P** = labour force participation rates, 1961. C.P. 1961, Volume V, Table 3.
- (U + E)_{nf}** = non-family-farm labour force. C.P. 1961, Volume V, Table 3. "Non-family-farm" occupations exclude farmers, and all farmer's relatives, but include agricultural labourers and "other agricultural occupations."

Abbreviations

- C.P. = Census of Population of Ireland.
 S.A. = Statistical Abstract of Ireland.
 T.E.U. = The Trend of Employment and Unemployment in (1954) etc.

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