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Annual Net Passenger Movement: Ireland 1926-76**

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* I am grateful to John Martin, Colm McCarthy and Brendan Walsh for helpful comments on an earlier draft. The usual disclaimer applies.

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WITH SERIES ON ANNUAL NET PASSENGER MOVEMENT: IRELAND, 1926-76*

Introduction

In a recent paper by Hughes and Walsh (1976) on migration flows between Ireland and the Rest of the World it was noted that there had been an estimated net immigration of approximately 12,000 people into Ireland during the period April 1971 - April 1976 according to the Government's Green Paper on Economic and Social Development, 1976-1980 (1976, p.8).¹ In view of the Census estimates which show that net emigration occurred during each intercensal period between 1871 and 1971 Hughes and Walsh would have liked to comment on the historic nature of the recent immigration in a sentence which would have done justice to the uniqueness of the event.² Unfortunately it was not possible to make such a comment because the period 1971-76 was not an

1. "Ireland" should be taken throughout this paper to refer to the area now covered by the Republic of Ireland unless otherwise stated.

2. Since compulsory registration of births and deaths did not commence until 1864, the first intercensal period for which estimates of net migration can be made is 1871-81. While it is not possible to make a categorical statement about intercensal net migration for previous periods, due to the absence of information on the natural increase, net emigration almost certainly took place from the area which now forms the Republic of Ireland during each intercensal period since 1821 - the first year for which a complete Irish Census is available. There are two gross emigration series which support this view. The first is the Registrar General's annual series on total gross emigration to all destinations which shows that nearly 1.5 million people emigrated from the twenty-six counties between 1852 and 1870. Given that the population of the twenty-six county area declined from over 5 million to just over 4 million between 1851 and 1871 it is obvious that during the intercensal periods 1851-61 and 1861-71 net emigration occurred on a massive scale. The second series is the Emigration Commissioners annual one on gross overseas emigration from the whole of Ireland (32 counties) to all places except Britain. It shows that there were nearly 1.7 million overseas emigrants from the whole of Ireland between 1825 and 1850 (both series are reprinted in the Emigration Commission Reports (1955, Statistical Appendix Tables 26 and 28)). This figure taken in conjunction with (i) Connell's (1950, p.29) view that the English 1841 Census figure of 419,000 Irish-born persons living in England at that time "can account for only a proportion of the Irish who had taken up residence in Britain in the previous sixty years" and (ii) the recurrent failures of the potato crop during the 30 years preceding the Famine (see Connell (1950, pp. 144-6) for a view of the evidence) make it highly unlikely, to say the least, that immigrants would have entered the whole of Ireland in numbers which would have offset the large gross outflows which took place in the intercensal periods 1821-31 and 1831-41. Net immigration is not a possibility which needs to be considered for the intercensal period 1841-51 because the flood of emigration which took place during this period was accompanied by a decline of 1.4 million in the population of the twenty-six county area. The incidence of emigration from Ulster does not appear to have been as severe during the period 1821-51 as it was in the rest of the country. This was probably due to the very marked differences in the

intercensal one, due to the cancellation of the 1976 Census and the net migration which occurred in those years could not, therefore, be compared with intercensal net migration between 1871 and 1971. Even if 1976 had been a census year it would not have been possible to make a meaningful comparison of the migration flows (i. e., the absolute numbers involved) which occurred during the five years 1971-76 with the migration flows which took place during the preceding century because all of the censuses between 1871 and 1946 (with the exception of the 1926 Census) took place at ten year intervals (those between 1946 and 1971 took place at five year intervals) and such a comparison would be open to the criticism that the periods being compared are different for most of the years under consideration. It is possible, for example, that there could have been net immigration during any of the five year periods following the censuses taken between 1871 and 1946 which was more than offset by net emigration during the subsequent five years. If this had happened, all that the census results would show would be net emigration for the whole ten year period.

The way to get around these difficulties is to derive annual estimates of net migration for the period in which one is interested. It then becomes possible to compare the net migration which occurred during a specified period with the migration which took place during any similar period covered by the estimates. Such estimates can be derived from the well-known net migration identity:

$$\sum_t^{t+i} (I - E) = P_{t+i_4} - P_t - \sum_t^{t+i} (B - D), \quad i = 1, \dots, 4 \quad (1)$$

where P, B, D, I and E are population, births, deaths, immigration and emigration respectively, t denotes the beginning of the period under consideration and i the quarter over which the flows of births, deaths, immigration and emigration are to be accumulated (quarterly data is used since this is the period covered by the published information on births and deaths). The migration identity shows that

2. (continued)

economic and social characteristics of Ulster, especially eastern Ulster, and the rest of Ireland - differences which became even more marked in the nineteenth century (i. e. the period with which we are concerned) as Beckett (1966, p.291) has pointed out. It is reasonable therefore to infer that most of the emigration which took place during each intercensal period between 1821 and 1851 originated in the twenty-six counties and to conclude that there is a very high probability that net emigration has occurred from the twenty-six county area in each intercensal period since 1821.

net migration (+ = net immigration, - = net emigration) is equal to the change in the population between one period and the next minus the natural increase which occurs over the period. Clearly net emigration will have taken place if the change in the population is less than the natural increase for a specified period.³

It must be pointed out that the net migration identity simply enables one to make explicit the annual net migration series which is implicit in the information published by the Central Statistics Office (CSO) on the estimated population at a particular time in each year, the number of births and deaths occurring in each year and the net passenger movement between Ireland and the rest of the world during each year. This can be clearly seen if one rewrites the identity as follows:

$$P_{t+i_4} = P_t + \sum_t^{t+i} (B - D) + \sum_t^{t+i} (I - E) \quad (2)$$

The identity now says that the population at time $t + i_4$ is equal to the population in the previous period plus the natural increase and net migration which have occurred during the period. If the population stock is known at a particular point in time (i. e., time t), and if information is available on the size of the natural increase and of net migration during a particular period, say a year, then it is a simple matter to derive an estimate of the population one year after time t . The CSO uses such information to derive its estimated population in each year. Its starting point is the size of the population on a particular census day. It knows the size of the natural increase which occurs in the year following the census and it

3. It is assumed, of course, for the purposes of this calculation that there is no under-registration of births or deaths. If there is under-registration, the net migration estimate will be affected e.g., if births are properly registered but deaths are under-registered, the net migration estimate will be larger than it should be in the case of net emigration and smaller than it should be in the case of net immigration. Dean and Mulvihill (1972) have shown that in a sample of parishes in the West of Ireland (where the problem of under-registration is expected to be greatest as it is a low income area) 7.5 per cent of all the deaths which took place between 1966 and 1969 were not registered. There was also some under-registration of births (1.9 per cent) but this was much lower than the under-registration of deaths, due to the incentives which parents have to register their children in order to qualify for childrens' allowances, admission to schools etc. No research seems to have been done into the extent of under-registration before 1966. It is not possible, therefore, to say how great a problem it might have been during most of the period with which this paper is concerned. However, it is worth noting that if accurate independent estimates of net migration were available, the difference between these estimates and the estimates which will be derived from the net migration identity discussed above would be a net indicator of the amount of under-registration of births and deaths which occurred at national level.

has an estimate of net migration for the same period which is based on information about the net passenger movement between Ireland and the rest of the world.

While the CSO has not published details of the method which it uses to estimate annual net migration from the net passenger movement figures it has indicated to persons who are interested in the matter that the annual net migration estimate is obtained by applying an adjustment factor to the net passenger balance for the twelve-month period ending in February, the factor being based on the relationship between the net passenger movement and net migration in the most recent intercensal period. The February to February period is taken as it is the valley period for passenger travel, particularly short-term (holiday etc.) movements, and it eliminates the distortion which could be introduced into the calendar year figures by the Christmas holiday period.⁴ The CSO has not published its annual net migration estimates as it considers that for any one particular year they could be subject to a very wide margin of error. It has recently been affirmed in a paper by an officer of the CSO (Keating (1977, p.4)) that the "annual estimates of net migration are, of course, the least reliable constituent in the compilation of the annual population estimate". However, when more firm information on net migration in the intercensal period becomes available from each successive census, the CSO's provisional estimates of net migration in that period are adjusted. The estimates which will be presented in Table 1 have had the benefit of this process for all intercensal periods up to 1971 and they should not, therefore, be subject to further revisions in the future.

Estimated Net Migration, 1926-76

It will be remembered from footnote 1 that statistics on births and deaths are available since 1864. Mid-year population estimates are available for the years 1841 to 1950 while population estimates for the month of April

4. See O'Herlihy (1966, p.38) for an example of how the Christmas holiday passenger traffic can affect the annual net passenger balance figures.

are available for 1951 and subsequent years.⁵ At first sight, therefore, it appears that a consistent annual net migration series could be derived from 1864 to the present day. However, it is only worth while deriving the net migration series from 1926 onwards because the passenger movement series which were available to the authorities for use in the derivation of the annual population estimates since 1841 are not consistent over the entire period. The Emigration Commissioners series on gross overseas emigration from the whole of Ireland was used to obtain the population estimates for the years 1842 to 1851 (an adjustment was, of course, made to this series and to the population figures for the whole of Ireland in order to estimate the population of the twenty-six county area during these years). The Registrar General's series on gross emigration to all destinations from the twenty-six counties was used to calculate the estimated population in the years 1852 to 1921 while the balance of migrants (i. e. emigration-immigration) outwards to places out of Europe and not within the Mediterranean Sea was utilised for the years 1922 to 1931.⁶

From 1932 to 1948 the Registrar General based the annual population estimates on "the balance of the passenger movement (including emigration and immigration)" figures (see the Annual Report of the Registrar General 1948 p. ix) while in 1949 the balance of the passenger movement by sea only was used. Since then no official statement appears to have been published about which passenger movement series has been used in the derivation of the annual population estimates. There are two series which could have been used. The first is the series on net

5. Annual population estimates are published in the Quarterly Report on Births, Deaths and Marriages and on Certain Infectious Diseases, the Report on Vital Statistics and the Statistical Abstract. The Quarterly Report and the Report on Vital Statistics describe the estimate as referring to the month of April while the Statistical Abstract refers to the estimated mid-year population. However, the figures from all three sources are identical. It appears that when the changeover was being made from mid-year to April estimates in 1951 the description of the estimate in the summary table in the Statistical Abstract was left unchanged through an oversight.

6. A short note on the sources and methods used in the derivation of the annual population estimates between 1841 and 1929 is given in the Department of Local Government and Public Health's Annual Report of the Registrar General, 1929 (1930, Table 1.).

passenger movement by sea to all places except Northern Ireland between 1926 and 1938 and by sea and air between 1939 and the present day. The second is the series on net passenger movement by sea, rail, road, and air to all places including Northern Ireland. This series is available from 1939 onwards. Clearly the first series must have been used up to 1939 since the other series was not available. It is not clear if the figures on passenger movement by rail, road and air were used thereafter (they were not used in 1949 as has been mentioned above). One result of the present study should be to shed some light on which series might have been used by examining the relationship between the net migration estimates and the two net passenger movement series. This relationship will be discussed after the net migration estimates have been presented.

It is clear from the Registrar General's Reports for 1931 and 1932 that while the net passenger movement by sea series is available on a calendar year basis since 1926 he did not begin to use it to derive estimates of the population in each year until 1931. Strictly speaking, therefore, our estimates should commence in 1931 because any net migration estimates which are derived for years prior to 1931 would be simply reproductions of migration series which have already been published. However it was decided to carry the estimates back to 1926 so that the 1936 Census figure on intercensal net migration between 1926 and 1936 could be used to check the annual net migration estimates for the period 1926-36.⁷

Due to the shift in 1951 in the date to which the annual population estimates refer, i. e., from mid-year to the month of April, a net migration series has been derived for the year commencing in April and another series has been derived for the year commencing on the 1st of July in order to ensure consistency throughout the years covered by the series. In addition a series has

7. A comparison of the figures on net passenger movement by sea for each of the years 1926 to 1930 with the figures for the balance of migrants to places out of Europe and not within the Mediterranean Sea showed only slight differences between the two series. Hence, one would expect a close correspondence between the accumulated annual net migration estimates for 1926-36 and the 1936 Census figure on intercensal net migration.

been derived i. e. for the calendar year since calendar year data is often required if one wishes to use the net migration series in conjunction with other economic or demographic series. The three series are shown in Table 1 for the half-century 1926-76.

Recalling that the April series is the one on which attention should be focussed in order to find out if the immigration which took place in the years April 1971-April 1976 had any precedent in the past, it will be seen from Table 1 that there were only two occasions in the last half-century when there was a net inflow of population into Ireland. The first was in 1931 when there was a net inflow of around 100 persons and the second was in the years 1939 to 1940 when there was a total net inflow of nearly 24,000 persons. The inflow which took place in the latter years undoubtedly occurred because of the outbreak of war in 1939. There were probably two main factors which affected the net inflow at that time. First, the desire of a certain number of people to get out of the firing line and second the introduction by the British authorities, in September 1939, of restrictions on entry to Great Britain or Northern Ireland. The Irish Government also introduced controls in the early years of the War which attempted to regulate emigration to employment in Britain. The British visa restrictions on the entry of women workers were lifted in July 1946 and in January 1948 all visa restrictions were abolished. However, the need to have travel identity documents for entry into Britain was continued until April 1952.⁸

In view of the exceptional circumstances under which the immigration of 1939 and 1940 took place, it seems reasonable to exclude these two years from our assessment and to confine attention to Irish migration behaviour during peacetime. It is clear from Table 1 that, when the war years are excluded, the net immigration which has been experienced during each of the years from April 1971 to April 1976 is unprecedented during the last half-century at least.

8. An account of the migration restrictions which were imposed by the Irish and British Governments during the War is given in Appendices VI and VII of the Emigration Commission Reports (1955).

Table 1: Estimates of Net Migration: Ireland 1926-76 (000s)

(+ = net immigration, - = net emigration)

Year	Year Commencing:			Year	Year Commencing:		
	1 January	April	1 July		1 January	April	1 July
1926	- 33.4	- 30.6	- 30.3	1952	- 34.5	- 32.9	- 33.2
1927	- 30.4	- 28.9	- 30.7	1953	- 35.0	- 25.7	- 37.4
1928	- 27.4	- 24.5	- 22.2	1954	- 43.0	- 45.5	- 45.6
1929	- 23.3	- 25.9	- 27.0	1955	- 47.9	- 48.2	- 47.6
1930	- 18.7	- 12.4	- 8.7	1956	- 41.8	- 41.2	- 45.3
1931	- 3.1	+ 0.1	+ 2.4	1957	- 53.9	- 58.2	- 50.9
1932	+ 0.7	- 0.4	- 2.4	1958	- 39.3	- 31.9	- 33.7
1933	- 5.8	- 8.9	- 9.6	1959	- 37.9	- 41.1	- 42.7
1934	- 13.8	- 16.9	- 17.9	1960	- 42.1	- 41.9	- 33.1
1935	- 18.7	- 18.3	- 19.6	1961	- 20.1	- 14.9	- 13.9
1936	- 27.5	- 31.2	- 30.7	1962	- 10.9	- 8.2	- 9.6
1937	- 26.4	- 25.8	- 27.9	1963	- 13.4	- 16.6	- 17.7
1938	- 23.9	- 19.2	- 17.4	1964	- 19.4	- 19.5	- 20.2
1939	- 3.4	+ 3.9	+ 9.3	1965	- 20.5	- 20.6	- 17.9
1940	+ 14.3	+ 20.0	+ 23.0	1966	- 14.1	- 13.4	- 14.7
1941	- 10.0	- 33.3	- 50.0	1967	- 15.9	- 15.7	- 14.5
1942*	- 48.5	- 45.9	- 41.5	1968	- 14.8	- 15.0	- 13.5
1943	- 29.9	- 24.4	- 22.0	1969	- 8.2	- 5.5	- 4.6
1944	- 17.3	- 14.4	- 13.0	1970	- 3.2	- 4.7 ³	- 4.8
1945	- 18.1	- 20.7	- 21.1	1971	- 2.4	+ 0.7	+ 2.4
1946	- 15.5	- 9.1	- 7.2	1972	+ 2.2	+ 1.8	+ 2.2
1947	- 10.9	- 16.0	- 19.1	1973	+ 3.3	+ 3.3	+ 3.7
1948	- 25.6	- 30.3	- 31.3	1974	+ 3.7	+ 4.1	+ 2.9
1949	- 34.1	- 36.4	- 38.0	1975	+ 3.1	+ 0.4	
1950	- 36.8	- 30.2	- 27.5	1976			
1951	- 29.5	- 35.1	- 36.1				

* These estimates are probably too high due to a once and for all increase in the number of births registered in 1942. See text for further comment.

Sources: Quarterly Report on Births, Deaths and Marriages and on Certain Infectious Diseases, March 1974 - September 1976; Report on Vital Statistics, 1973, 1969 and 1959; Annual Report of the Registrar General, 1936-1949

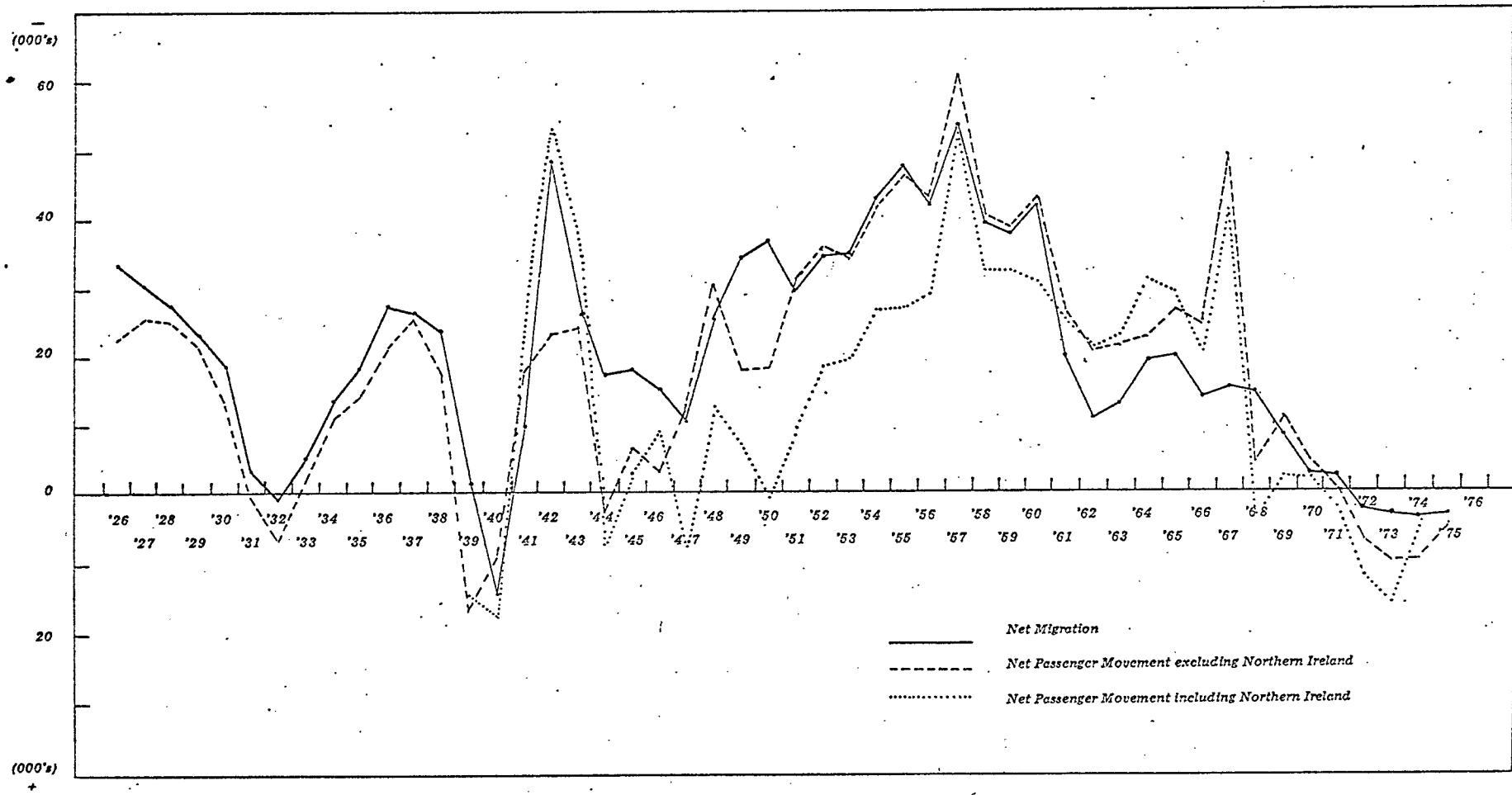
Note: The population figures which were used in the derivation of (a) the calendar year series for the whole period were derived by taking the average of consecutive mid-year figures for the years 1925-76, (b) the April series for the years 1926-51 were taken from the Censuses of 18 April 1926, 26 April 1936, 12 May 1946 and 8 April 1951 or they were derived by linear interpolation from the mid-year figures for the period 1926-51 (c) the July series for the years 1951-76 were derived by linear interpolation from the Censuses of 8 April 1951, 8 April 1956, 9 April 1961, 17 April 1966 and 18 April 1971 or from the April figures for the years 1951-76.

Indeed, in view of what has been said in footnote 1 and the annual gross emigration series which go back to the 1820's, one is tempted to say that it is an occurrence without parallel in the last one hundred and fifty years. With the exception of the years 1914-21 when gross emigration was relatively low due to exceptional circumstances i. e., the 1914-18 War and the Irish War of Independence of 1919-21, there was never a year between 1952 and 1925 when gross emigration from the twenty-six county area to all destinations fell below 16,000 persons per year (the nadir occurred in 1908 when 16,882 persons left) and there was no year between 1825 and 1851 when gross overseas emigration (i. e., excluding Britain) from the whole of Ireland fell below 11,000 persons per year (the nadir occurred in 1825 when 11,426 persons left for overseas destinations). While one cannot be absolutely sure that there was never a period of net immigration into the twenty-six county area between 1825 and 1925 the evidence against such an occurrence is very strong indeed.

The immigration which has occurred in the last five years does not mean that there has been a complete transformation in migration behaviour in Ireland and that the phenomenon will not recur in the future. A glance at Chart 1, in which the net migration series is graphed together with some others which will be commented upon later, shows that the recent immigration is simply a continuation, if not the culmination, of a downward trend in migration behaviour which has been underway since the peak levels of the middle and late 1950's were passed.

There are definite signs of cyclical behaviour in the net migration series in Chart 1 which suggest that Irish migration has responded to fluctuations in economic conditions at home and abroad in both the pre- and post-war periods. Walsh (1974, p.119) has demonstrated that "economic conditions in both Ireland and Britain are needed to explain fluctuations in the net emigration rate" in the post-war period and it would be of great interest to investigate the way in which changes in internal and external economic conditions affected migration behaviour in the pre-war period. Account would, of course, have to be taken in such an

Chart 1: Net Migration and Net Passenger Movement Including and Excluding Cross-Border Passenger Movement, 1926-1976.



investigation of the change which occurred in American immigration policy in 1930 and which resulted in the main stream of emigration from Ireland being switched from the United States to the United Kingdom.

The evidence of periodicity in migration behaviour which emerges from Chart 1 combined with (i) the fact that the only year in which net immigration took place in peacetime in the previous half-century occurred in the middle of the Depression and that net emigration remained at a low level for a few years thereafter before climbing to its pre-Depression level, (ii) the unprecedented growth in the labour force with which the country is now faced (see Walsh (1975) for the current estimates) and (iii) the relationships which Walsh (1974) has established between Irish migration, unemployment and wage levels in Britain and Ireland suggests that there may well be a resumption of net emigration from Ireland within the next few years or so.⁹

An examination of the rise and fall in net emigration at different periods in Chart 2 suggests that the net emigration figure for 1942 is higher than one would expect on the basis of previous experience. An analysis of the data used to derive the estimate of net migration for that year shows that there were 66,117 births in 1942 (i. e. for the calendar year), as against 56,780 in the previous year and an annual average of 57,105 in the decade 1931-40. The number of deaths registered in 1942 was 41,640 as against 43,797 in 1941 and an annual average of 41,841 in the ten years 1931-40. As a result of the large increase in the number of births registered in 1942, the natural increase in that year is recorded as 24,477 persons as against 12,983 in 1941 i. e. an increase of nearly 100 per cent. The increase in the number of births occurring in 1942 has been noted in volume 1 of the 1946 Census of Population where it has been attributed (p. vi) to "the introduction of food rationing in 1942 and the consequent

9. A number of economists have already drawn attention to this possibility e.g. O'Grada, Gibson, Walsh. See "Back to the Boats for the Unemployed", Irish Times, January 28, 1977 for the views of Professor Gibson and Dr. Walsh and "Lecturer Predicts 'inevitable outward flow' to US in '80s," Irish Times, August 23, 1976 for Dr. O'Grada's opinion.

necessity for immediate registration of births (up to that time there had been a 'lag' of from 3 to 6 months in birth registration)". While the reduction in the lag in registering births must have accounted for some of the increase in 1942 it cannot have accounted for all of it. If it had, the number of births registered in the next year should have returned to the level existing before the introduction of rationing. This did not happen. In 1943, 64,375 births were registered and the annual average recorded in the 10 years 1944-53 was 65,290. Thus, the increase which took place in 1942 was sustained in subsequent years and it is reflected in an increase in the annual average birth rate from 19.3 per 1,000 in the ten years before 1942 to 22.1 per 1,000 in the ten years from 1942 to 1951. This increase in the birth rate does not appear to have been caused by an increase in the fertility of marriage. On the basis of a comparison of the 1911 and 1946 Census results, on average family size classified by duration of marriage, the Emigration Commission showed (Reports, p. 94) that there had been a reduction in fertility between 1911 and 1946 and Walsh (1968, p. 6) has demonstrated that fertility patterns remained stable between 1946 and 1961. The Emigration Commission suggested (Reports, p. 89) that the increase in the number of births which occurred in 1942

"is attributable to a large extent, to the increase in the number of marriages which took place, and also to the introduction of war-time food rationing which, by inducing more complete and prompt registration considerably affected the numbers recorded in the single year 1942, and probably the figures for later years, though to a lesser extent".

The increase in the number of marriages from 15,021 in 1941 to 17,470 in 1942 cannot account for more than a small proportion of the increase in the number of births in 1942. It would be remarkable, to say the least, if an increase of 2,449 marriages in 1942 could explain an increase of 9,337 births in the same year.¹⁰

The most plausible explanation for the increase, in the author's opinion, is that there was considerable under-registration of births before 1942.

10. All figures used in this paragraph are taken from the Annual Report of the Registrar General, 1942, Tables 1 and 4 and the Report on Vital Statistics, 1959 Tables 1 and 4.

It will be remembered from footnote 3 that some under-registration of births has been noted by Dean and Mulvihill (1972) in their sample of parishes in the West of Ireland at a time (i. e. the late 1960's) when there were strong incentives for parents to register all their children. Lack of interest in registering births must have been much greater at a time when there were no very strong incentives to encourage registration as would have been the case in the years before 1942. It is reasonable to assume that this situation was rectified with the introduction of rationing in 1942 and that the introduction of Childrens' Allowances in 1944 provided a strong encouragement for complete registration after the cessation of rationing.

The Emigration Commission did not attempt to quantify the effects of the increase in the number of marriages or of more complete registration in its assessment of the 1942 figures. This is a matter on which some work needs to be done because if there was substantial under-registration of births before 1942 without a compensating under-registration of deaths, a number of demographic series, including the net migration series presented here, would have to be revised to take account of this. The net migration estimates for 1926-41 would, of course, understate emigration and overstate immigration if the under-registration of births was not offset by under-registration of deaths over this period.

Net Migration from the Republic of Ireland and Northern Ireland, 1952-76

It will be seen from Table 1 that there was a sharp decrease in net emigration in 1969 and that the impetus which this appears to have given to the long-term downward trend seems to have continued until 1974 when the net immigration position which had then been attained appeared to stabilise at a level of around 3,000 persons per year. Very little research has been done into the causes of the change in the level of net emigration in 1969 and subsequent years. Further work in this area will have to be awaited before conclusions can be drawn regarding the reasons for the change. There is, however, one piece of research which needs to be mentioned in this context and that is Walsh's (1976) work on the relationship between unemployment benefit and assistance payments and the unemployment rate. Walsh stresses that while his results are "in need of much further testing" (p. 15) they tentatively

suggest that "the main influence of unemployment compensation payments on the Irish labour market has been to lower the rate of net emigration, which leads in turn to higher levels of domestic unemployment", (p. 12). Since much of the increase in the ratio of unemployment compensation to average industrial earnings dates from 1968 the sharp decrease in net emigration in the following year may be connected with this increase. Walsh notes (p. 10) that the maximum entitlement to unemployment benefit was extended from 156 to 312 days in 1968 but he finds no direct evidence that this had an effect on the emigration rate.

One other possibility which suggests itself is that the change in 1969 was connected in some way with the events in Northern Ireland which began in 1969. There could have been a substantial movement of people from Northern Ireland into the Republic in 1969 which continued in subsequent years as the violence in Northern Ireland intensified. If this had happened one would expect to find an increase in the number of persons born in Northern Ireland and living in the Republic as recorded in the census information on the birthplaces of the resident population. However, far from there having been an increase, the 1971 Census records that there was a decrease in the number of such persons from 27,129 in 1961 to 26,183 in 1971. It is possible of course that most of those who would have entered the Republic from Northern Ireland could have been born in the Republic and that such movement would not, therefore, show up in the Republic's birthplace statistics. However, it would show up in the Northern Ireland birthplace figures as they record the number of persons born in the Republic and living in Northern Ireland on census date. There were 53,124 such persons in Northern Ireland in 1961. A survivorship analysis, which was done separately for males and females shows that 45,749 of this group should have been found in Northern Ireland in 1971 if mortality was the only demographic influence to affect the group in the intervening ten year period. The actual number of persons born in the Republic and living in Northern Ireland in 1971 was 46,402 so there was a small net inflow into Northern Ireland from the Republic between 1961 and 1971. Immigration from Northern Ireland to the Republic is

unlikely to have caused the substantial decrease in the net migration rate in the Republic in 1969 and it certainly played no part in the long-run decline in the rate during the 1960's.

While there is no evidence of a substantial immigration having taken place from Northern Ireland into the Republic in recent years on anything other than a short-term basis, there is ample evidence of substantial net emigration having taken place from Northern Ireland to the rest of the world as a result of the present troubles. This evidence is presented in Table 2 and a comparison of the net migration rates for Northern Ireland and the Republic is made in Chart 2 for the post-war period.

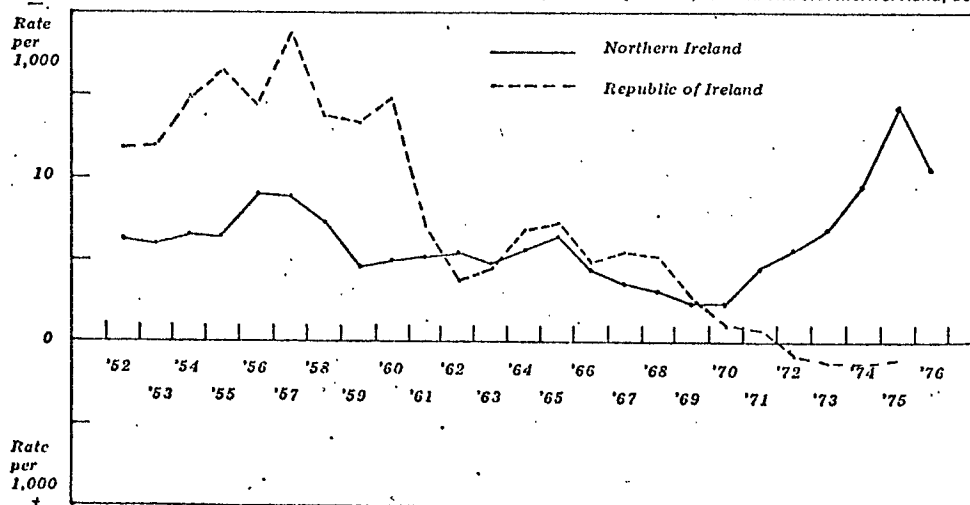
Table 2: Estimates of Net Migration : Northern Ireland 1952-76 (000's)
(+ = net immigration, - = net emigration)

Year	Net Migration	Year	Net Migration	Year	Net Migration	Year	Net Migration	Year	Net Migration
1952	- 8.5	1957	- 12.4	1962	- 7.8	1967	- 5.2	1972	- 8.4
1953	- 8.2	1958	- 10.2	1963	- 6.9	1968	- 4.6	1973	- 10.4
1954	- 8.7	1959	- 6.4	1964	- 8.2	1969	- 3.8	1974	- 14.9
1955	- 8.6	1960	- 7.0	1965	- 9.5	1970	- 3.7	1975	- 21.9
1956	- 12.6	1961	- 7.3	1966	- 6.5	1971	- 6.9	1976	- 15.9 ^P

P = provisional estimate.

Sources: Population Trends, Winter 1976; Annual Abstract of Statistics, 1975 and 1973; Monthly Digest of Statistics, January 1977 and January 1976; General Register Office, Belfast.

Chart 2: Net Migration Rates per 1,000 Population for the Republic of Ireland and Northern Ireland, 1953-76.



It will be seen from the table that Northern Ireland has suffered a loss of population through emigration in each of the years 1952-76 but that its rate of net emigration has been lower in most years and significantly lower throughout the 1950's, than the rate in the Republic as the chart shows. There was very little difference between the two rates throughout the 1960's but the downward trend in the rate for Northern Ireland levelled off in 1970 while the rate in the Republic continued to decline. In 1971 the two rates began to diverge sharply with the rate in Northern Ireland showing an increase of nearly 90 per cent over the rate in the previous year and the rate for the Republic showing a decrease of almost thirty per cent. Since then the rate in Northern Ireland has risen dramatically. It climbed to 14.2 per 1,000 in 1975, the highest rate recorded in the last 25 years at least, and it now stands at 10.4 per 1,000 or just on 16,000 persons per year. The rate in the Republic continued to fall between 1970 and 1974. A net inflow of population of 0.7 per 1,000 was recorded in 1972 and a small net inflow has been recorded in every year since then. While one would need a thorough study of the social, economic and political factors which have influenced emigration from Northern Ireland over the post-war period in order to quantify the effect of each, it would seem, on the basis of the evidence presented, that political developments since 1969 have had more to do with the historically high levels at which emigration from Northern Ireland is now running than changes in economic or social circumstances. Thus, the stabilisation which occurred in the rate in 1970 was probably connected with the onset of the present troubles in 1969 while the upsurge which took place in 1971 could have been associated with the introduction of internment in that year and the ensuing intensification of violence. It is to be hoped that when research is undertaken into the determinants of migration in Northern Ireland some attention will be given to quantifying the effect of political and social factors, (e.g. the connection between migration and discrimination in the labour market) as well as to the more conventional economic factors which are usually investigated in such studies. ¹¹

11. Bowles' (1970) study of migration from the American South is a noteworthy exception. He incorporates variables in his model which try to account for differences in black and white migration rates due to discrimination against black workers in the South.

Comparison with Other Annual Net Migration Estimates

Using the same net migration identity as has been used in the present paper Walsh (1968) and (1974) and Geary and McCarthy (1976) have derived estimates of annual net migration for the post-War period in connection with their studies of the Irish labour and goods markets. Their estimates are compared with the present estimates in Table 3.

Table 3: Estimates of Net Migration by Walsh, 1948-65 and 1951-71, Geary and McCarthy 1951-71, and Hughes, 1948-71 (000s)

Year	Walsh (1)	Walsh (2)	Geary and McCarthy	Hughes
1948	25.6	-	-	25.6
1949	34.1	-	-	34.1
1950	35.8	-	-	36.8
1951	30.5	28.5	28.5	29.5
1952	35.5	34.5	35.5	34.5
1953	34.0	35.0	34.0	35.0
1954	41.0	44.0	41.0	43.0
1955	46.9	46.9	46.4	47.9
1956	44.8	42.8	44.8	41.8
1957	48.9	53.9	49.4	53.9
1958	45.3	38.3	44.8	39.3
1959	35.9	37.9	36.4	37.9
1960	42.1	42.1	42.1	42.1
1961	29.1	20.1	26.1	20.1
1962	16.9	9.9	11.9	10.9
1963	16.5	13.5	12.5	13.4
1964	15.4	19.4	18.4	19.4
1965	17.5	21.5	20.5	20.5
1966	-	13.1	15.6	14.1
1967	-	15.9	16.9	15.9
1968	-	14.8	16.8	14.8
1969	-	8.2	9.7	8.2
1970	-	3.2	5.4	3.2
1971	-	3.4	3.1	2.4

Sources: Walsh (1968) and (1974), Geary and McCarthy (1976), and Table 1 above.

- :Not available

It will be seen from the table that there are significant differences between the Walsh (1), Geary and McCarthy, and Hughes estimates in 1956, 1957 and 1958, between the Walsh (1) and Hughes estimates for the years 1961 to 1965 and between the Geary and McCarthy and Hughes estimates for 1961 and for the years 1968 to 1971. There are two reasons for these differences. The first is that Walsh, in his estimates for 1948-65, and Geary and McCarthy assumed that the annual population estimates refer to the middle of the year and they derived the population at the beginning of each year by averaging what they took to be the mid-year population in year t and year $t + 1$. This assumption is incorrect since as has been noted in connection with Table 1, the annual population estimates from 1951 onwards refer to the population in the month of April in each year.¹² The second reason is that the annual population figures which Walsh used to derive his first set of estimates for the years 1961-65 and which Geary and McCarthy used to derive their estimates for the period 1966-71 were revised in the light of the 1966 and 1971 Census results. There is never more than a difference of 1,000 between Walsh's second set of net migration estimates and Hughes' estimates for the years 1951-71. Furthermore, it will be observed that there is a tendency for a difference of + 1,000 in one year to be followed by a difference of - 1000 in the following year and vice versa. The reason for the differences and for the observed sign pattern is that Walsh has assumed that the annual population estimates since 1951

12. Walsh used the population estimates published in the Statistical Abstract to derive his net migration estimates for the period 1948-65. It will be remembered from footnote 5 that while the population estimates in the Statistical Abstract are described as giving the "estimated mid-year" population, they refer in fact to the population in the month of April. Geary and McCarthy appear to have used the Report on Vital Statistics, 1971 as their source for the annual population figures which they needed to derive their net migration estimates. The table in which the annual population estimates were published in 1971 does not contain any reference to the date to which the population estimates refer although it is pointed out on page VII of the report that the population figure for 1971 refers to the date on which the 1971 Census was taken. It would be helpful to users of the annual population estimates if the note which used to be attached to the annual population table in the Reports for 1969 and previous years could be restored in future reports on vital statistics, i. e. "for 1951 and subsequent years the figures relate to the month of April".

refer to the 1st April whereas Hughes has assumed that they refer to the 15th April. (The Report on Vital Statistics does not say to which date in April the annual population estimates refer). Walsh's interpolation factor for the population at the beginning of each year is, therefore, 275/365ths of the difference in the population between one year and the next while Hughes' is 260/365ths (in Census years and in the year preceding and succeeding a census Hughes' factor will differ from 260/365ths by some days, depending on the date of the census). Clearly, a positive difference between the two estimates in year t will be accompanied by a negative difference of the same amount in the year $t + 1$ and vice versa unless the difference is offset by differences in Hughes and Walsh's estimates of the population at the beginning of year $t + 1$.

Relationship Between the Net Migration Estimates and the Net Passenger Movement Data

It has been mentioned earlier that the annual population estimates are based on the natural increase and net passenger movement data and that the net migration estimates presented above make explicit a series which is implicit in the annual population and natural increase data. One would therefore expect that there would be a close relationship between the net migration series and the net passenger movement data. It will be remembered, however, that over most of its existence the passenger movement series has included information on passenger traffic between the Republic and Northern Ireland but that when this information was first included in the data for 1939 no official indication was given as to whether it formed part of the input into the calculation of the annual population estimates. Most, if not all, of those who have included migration equations in their models of the Irish economy or of the Irish labour market and who have considered the net passenger movement data in the process of doing so have assumed that if the net passenger movement data were to be used as a proxy for net migration the figures for total net passenger movement to all places including Northern Ireland would be the appropriate ones to use. Thus, O'Herlihy (1966) used the calendar year figures of net passenger movement from Ireland by sea, rail, road and air

as a measure of net emigration in his migration equation for the period 1948-63. Walsh (1968, p. 18) in his assessment of the net passenger data drew attention to the fact that "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", (i. e. of the gross outflows and inflows). Walsh went on to compare the total net passenger movement figures with census estimates of intercensal net migration for the periods 1951-56, 1956-61, and 1961-66 and found that the net passenger movement data gave highly inaccurate estimates of net migration during each period and that the discrepancy between the census and passenger movement estimates had a positive trend in each of the intercensal periods between 1951 and 1966. For these reasons he concluded that "the use of net passenger movement data in time series migration studies must therefore be avoided" (p.18). Martin (1975) in his study of the Anglo-Irish labour market in the post-war period reiterated Walsh's conclusions about the net passenger data.

The relationship between total net passenger movement and estimates of net migration will be examined to see if Walsh's conclusion is justified for the longer period with which this paper is concerned. The relationship between net passenger movement excluding cross-border passenger movement and estimates of net migration will also be scrutinised to find out if there is any association between the two. The net passenger movement series including and excluding Northern Ireland have been derived for the same periods as the net migration estimates in Table 1 (i. e. on a calendar year, April to April and July to July basis) in order to facilitate comparisons. The results are shown in Table 4. The census estimates of net emigration for each intercensal period between 1926 and 1971 and the two net passenger movement estimates together with the estimates derived from the net migration identity (the results of which are presented in Table 1) are shown in Table 5. The latter figures are included in the table in order to check the accuracy of the present estimates of net migration on an intercensal basis against the census estimates.

Table 4: Net Passenger Movement from the Republic of Ireland to All Places Including and Excluding Northern Ireland, 1926-76 ('000s)

Year	Calendar Year		Year commencing 1 April		Year commencing 1 July	
	Including Northern Ireland	Excluding Northern Ireland	Including Northern Ireland	Excluding Northern Ireland	Including Northern Ireland	Excluding Northern Ireland
1926	-	- 22.6	-	-	-	-
1927	-	- 25.8	-	-	-	-
1928	-	- 25.1	-	-	-	-
1929	-	- 21.9	-	-	-	-
1930	-	- 13.7	-	-	-	-
1931	-	+ 0.7	-	-	-	-
1932	-	+ 6.5	-	-	-	-
1933	-	- 2.6	-	-	-	-
1934	-	- 11.0	-	-	-	-
1935	-	- 14.3	-	- 16.9	-	- 19.4
1936	-	- 21.5	-	- 21.0	-	- 26.8
1937	-	- 25.9	-	- 29.6	-	- 23.4
1938	-	- 17.6	-	- 13.9	-	- 14.4
1939	+ 14.0	+ 16.2	+ 14.6	+ 14.9	+ 16.1	+ 13.8
1940	+ 17.2	+ 8.3	+ 31.0	+ 24.1	+ 36.3	+ 25.2
1941	- 23.4	- 17.9	- 53.8	- 33.1	- 70.2	- 36.9
1942	- 53.3	- 23.6	- 43.9	- 28.2	- 41.0	- 28.0
1943	- 37.4	- 24.3	- 35.0	- 24.2	- 28.3	- 22.3
1944	+ 6.6	+ 2.2	+ 16.1	+ 10.1	+ 18.2	+ 13.6
1945	- 2.3	- 6.7	- 14.9	- 13.6	- 0.5	+ 1.6
1946	- 9.0	- 3.3	- 13.3	- 21.2	- 12.9	- 11.3
1947	+ 7.6	- 13.7	+ 18.7	- 6.4	+ 17.7	- 4.9
1948	- 12.6	- 30.5	- 25.8	- 40.3	- 27.8	- 38.6
1949	- 7.8	- 18.1	- 3.0	- 14.8	+ 6.2	- 9.6
1950	+ 0.2	- 18.6	+ 8.5	- 11.7	- 3.6	- 24.4
1951	- 9.9	- 31.4	- 19.7	- 39.5	- 11.4	- 29.1
1952	- 18.6	- 35.9	- 14.3	- 32.4	- 17.2	- 36.5
1953	- 19.9	- 34.1	- 29.6	- 40.1	- 30.7	- 40.8
1954	- 26.9	- 41.3	- 32.0	- 48.9	- 31.2	- 50.7
1955	- 27.0	- 46.2	- 17.2	- 36.5	- 29.3	- 47.8
1956	- 29.0	- 42.8	- 46.6	- 57.0	- 40.0	- 49.6
1957	- 53.5	- 60.5	- 48.8	- 57.8	- 39.6	- 48.1
1958	- 32.8	- 40.3	- 20.5	- 26.0	- 31.9	- 35.3
1959	- 32.3	- 38.8	- 44.9	- 52.6	- 33.8	- 44.6
1960	- 30.9	- 43.0	- 18.9	- 31.2	- 24.7	- 33.2
1961	- 25.6	- 26.8	- 34.1	- 32.4	- 17.1	- 16.7
1962	- 21.0	- 20.8	- 13.3	- 13.6	- 13.1	- 13.3
1963	- 22.8	- 21.9	- 15.9	- 12.9	- 29.5	- 24.2
1964	- 31.3	- 22.4	- 46.2	- 37.4	- 32.1	- 25.4
1965	- 29.5	- 26.9	- 29.4	- 29.4	- 34.4	- 36.8
1966	- 20.8	- 24.2	- 8.1	- 13.3	- 2.5	- 10.1
1967*	- 41.5	- 49.1	- 29.6	- 38.1	- 13.9	- 22.9
1968	+ 3.5	- 4.5	- 6.5	- 16.8	- 9.9	- 18.0
1969	- 2.4	- 11.0	+ 6.1	- 0.6	- 10.8	- 17.4
1970	- 2.3	- 4.9	- 12.1	- 13.9	- 7.4	- 8.3
1971	+ 1.1	- 1.1	+ 5.2	+ 3.7	- 5.1	- 7.2
1972	+ 11.4	+ 6.7	- 0.5	+ 0.5	+ 11.7	+ 9.7
1973	+ 15.7	+ 9.4	+ 7.8	+ 4.4	- 3.0	- 2.3
1974	+ 3.4	+ 9.2	+ 11.6	+ 14.8	- 0.6	+ 2.9
1975		+ 4.4		- 2.3		+ 6.9

- : Not available

* The figures for 1967 were affected by the restrictions on travel between Ireland and Britain which were imposed because of the outbreak of foot and mouth disease in Britain in Autumn 1967.

Note: While annual figures for net passenger movement to all places excluding Northern Ireland are available for 1926 and subsequent years the publication of monthly figures for net passenger movement did not begin until 1935.

Sources: Irish Statistical Bulletin (formerly Irish Trade Journal and Statistical Bulletin) 1928-76; Statistical Abstract, 1941-1970/71; Economic Series, 1975-1977, February 1977.

Table 5: Census Estimates of Net Migration Compared with Net Passenger Movement Data Including and Excluding Cross-Border Passenger Movement and Hughes' Estimates of Net Migration, 1926-71. (000's)
(+ = net immigration, - = net emigration)

Intercensal Periods	Census Estimates	Net Passenger Movement:		Hughes' Estimates
		Including Northern Ireland	Excluding Northern Ireland	
1926 - 36	- 166.7	-	-	-166.7
1936 - 46	- 187.1	-	- 114.5	-191.0
1946 - 51	- 119.6	- 14.9	- 94.4	-122.0
1951 - 56	- 196.7	- 112.8	- 197.4	-197.4
1956 - 61	- 212.0	- 179.7	- 224.6	-214.4
1961 - 66	- 80.6	- 138.9	- 125.7	-79.8
1966 - 71	- 53.9	- 50.2	- 82.7	-54.3

Sources: Tables 1 and 4 and Census of Population of Ireland, 1971, Vol. 1, Table 1.
-: Not available.

It will be seen from Table 4 that there are only slight differences between the census estimates of net migration in each intercensal period between 1926 and 1971 and Hughes' estimates for the same years. The difference between the two estimates in the period 1936-46 arises because of the changes affecting the registration of births in 1942, which have already been discussed at length, and the adjustment which was made to the census estimates to counter-balance the increase in the registration of births which occurred in that year. The slight discrepancies which occur in other intercensal periods may be due to the Censuses having been taken on different dates in April or May while the natural increase data from which Hughes' estimates are derived were always aggregated on 1 April - 31 March basis, and to the fact that the annual population for the month of April was derived by linear interpolation in the years before 1951. Since the differences between the Census estimates of net migration and Hughes' estimates are slight, it can be concluded that the annual estimates given in Table 1 must be in close agreement with the annual estimates used by the CSO in the derivation of its annual population estimate.

The net passenger movement data including cross-Border passenger movement are clearly not a good proxy for intercensal net migration for any period except 1966-71. The total passenger movement data seriously underestimated net migration in all intercensal

periods between 1946 and 1961 and it seriously overestimated net migration in the period 1961-66. In addition the positive trend which Walsh (1968) commented upon can be seen to have been present in all intercensal periods between 1946 and 1966. The positive trend is absent from the estimate for 1966-71 and the correspondence between the two series in this period is quite good. The discrepancies between the passenger movement data excluding Northern Ireland and the census estimates of net migration are much smaller in all intercensal periods except that for 1966-71, than is the case for the total passenger movement series. The passenger movement data excluding Northern Ireland seriously underestimated net migration in the periods 1936-46 and 1946-51, was in very close agreement with the census estimate for 1951-56 and seriously overestimated net migration in all intercensal periods thereafter. There is also a strong positive trend in the discrepancy between the net passenger movement data excluding Northern Ireland and the census estimate of intercensal net migration in the years 1936-66. The correspondence between the census estimates of net migration and the net passenger series is clearly not good for intercensal periods between 1936 and 1966 although the correspondence is considerably improved when the cross-Border movements are excluded from the net passenger movement data. There could, however, be a closer correspondence between the figures on an annual basis because the fluctuations in the various series could be closely associated although the levels at which the figures stand in any one year might differ considerably. The annual net passenger movement figures including and excluding Northern Ireland have been graphed with the annual net migration estimates in Chart 1.

Chart 1 clearly suggests that there is a much closer association between the annual net migration estimates and the net passenger movement figures excluding Northern Ireland than there is between the net migration estimates and the total net passenger movement figures. The impressions which one gets from a chart should, of course, be subjected to a proper test to avoid drawing erroneous conclusions. Accordingly the annual net migration estimates have been regressed on the annual passenger movement figures including and excluding cross-Border passenger movement and the results are shown in Table 6.

Table 6: Regressions of Annual Net Migration Estimates on Annual Net Passenger Movement including and excluding Northern Ireland for Various Periods between 1926 and 1974

Period	Intercept	Net Passenger movement Coefficient	R ²	S.E.E.	D.W.
Year commencing January, 1939-74	- 11.588 (4.6)	0.658 (6.3)	.54	11.8	0.66
Year commencing April, 1939-74	- 12.405 (4.6)	0.584 (5.7)	.49	13.1	1.08
Year commencing July, 1939-74	- 11.323 (4.3)	0.651 (6.4)	.54	12.8	0.92
Excluding Northern Ireland					
Year commencing January, 1939-74	- 6.322 (3.6)	0.766 (11.0)	.74	8.5	1.41
Year commencing April, 1935-74	- 6.586 (3.0)	0.725 (9.5)	.70	9.5	1.81
Year commencing July, 1935-74	- 4.992 (2.3)	0.813 (10.3)	.74	9.2	1.58

Note: t-values are shown in brackets.

Table 6 shows that there is a significant association between the net migration and total net passenger movement figures but that only about half of the variance in the annual net migration estimates is explained by the variation in the total net passenger movement series. All of the regression coefficients are significantly different from zero at the 5 per cent level as the t-values indicate and the same holds for the intercept terms and for the R² values. The Durbin-Watson values indicate the presence of positive autoregressive disturbances in all three regressions. This is not an unexpected result in view of the positive trend which has been observed in the discrepancies between the net migration estimates and the net passenger movement figures.

The association between the net migration estimates and the net passenger movement series is considerably improved when the influence of cross-Border movement is removed from the net passenger movement figures. All of the regression coefficients and their associated t-values show a marked increase while there are significant decreases in the intercept terms and their associated t-values. The coefficients of determination

are now all around the .7 mark so that over two-thirds of the variance in the net migration estimates can now be explained by the passenger movement data when cross-Border movement is excluded. The Durbin-Watson values indicate the absence of positive serial correlation in the disturbance term in the regressions for April and July but not for January.

The improvement in the association between annual net migration and annual net passenger movement when cross-Border passenger traffic is excluded from the passenger movement series is due to the fact that the series on passenger movement to and from Northern Ireland only records that part of the total cross-Border passenger traffic which travels by rail or bus. Persons moving across the Border by car or on foot are not recorded in cross-Border passenger movement figures because of the obvious difficulties of doing so. The recorded net passenger movement figures for Northern Ireland may not, therefore, give an accurate indication of the true position with regard to net movement between the Republic and Northern Ireland. It is worth noting, for example, that the cross-Border series showed substantial net immigration into the Republic from Northern Ireland in 20 of the 25 years 1950-1974 while the series for net passenger movement by sea showed substantial net emigration for 22 of the 25 years in the same period and the series for net passenger movement by air showed substantial net emigration in 24 of the 25 years concerned. The difference between cross-Border net passenger movement and net passenger movement to all other areas is surprising because the Republic has been an area of much higher emigration than Northern Ireland throughout most of the post-War period.

The regression results are clearly sensitive to the time of the year in which the net migration and net passenger movement series start. The association between the two series is strongest on a July to July basis and weakest on an April to April basis. It has been pointed out already that the timing of holidays periods can affect the net passenger movement figures. It appears from the regression results that the occurrence of the Christmas holiday period at the end of the calendar year and of the Easter holiday period at the beginning of the year commencing in April have a more adverse effect on the association between the two series than the coincidence of the

summer holiday period with the year beginning in July. It is clear from the sensitivity of the annual net passenger movement figures to the timing of holiday periods that the timing of such events could have an even greater effect on quarterly figures and anyone who wished to use the quarterly net passenger movement figures (or the monthly figures) as a proxy for quarterly net migration flows would have to consider whether such a series would measure what it is intended to measure. It may be noted in passing apropos the use of quarterly net passenger movement figures to derive quarterly net migration estimates by a related series method such as Chow and Lin's (1971) that in using such a method one is imposing the seasonal pattern in the passenger movement series on the quarterly net migration series. Thus, one has to assume that there is no difference between the seasonal movements of migrants and the seasonal movements of all other travellers between Ireland and the rest of the world if one wishes to use the related series technique. It might be possible to glean some information on the validity of the assumption from the monthly emigration and immigration figures for overseas migrants which were published in the inter-war period in the Irish Trade Journal.

If one is concerned only with the relationship between the total net passenger movement series and the annual estimates of net migration, one would have to accept Walsh's (1968) view that the use of the net passenger movement data in time series migration studies should be avoided. However, the relationship between the two series is considerably improved if cross-Border passenger movement is excluded from the passenger movement data and one could certainly use the adjusted net passenger movement data in a time series study of migration.¹¹ This conclusion emerges even more strongly from a comparison of the relationship between the annual net migration estimates and the net passenger movement series excluding Northern Ireland for the post-War period with which Walsh (1968) was concerned. Regressing the net migration

11. Martin (1975) has shown that the inclusion of a trend variable in the regression of net migration on total net passenger movement leads to a considerable improvement in the relationship between the two series. His regression equation for the period February 1951-71 is $M_t = 27.629 + 0.584 P - 0.088T$, $R^2 = .82$, S.E.E. = 6.5, D.W. = 0.79
(5.4) (4.6) (5.2)

where P = total net passenger movement and T = 1, 2, 3, 21.

series (M_t) on the sum of the net passenger movement by sea and air (SA_t), i. e. excluding cross-Border passenger movement, for the period July 1951-74 gives the following result:

$$M_t = 2.450 + 0.965 SA_t, R^2 = .89, S.E.E. = 5.9, D.W. = 2.27$$

It will be seen from this equation that nearly 90 per cent of the variance in the annual net migration series is explained by the series on net passenger movement excluding cross-Border movement. The standard error of estimate is considerably lower in the equation for the post-War period than it is in the equation for the period 1935-74 shown in Table 6 and the Durbin-Watson statistic shows no evidence of autocorrelation. The regression coefficient of 0.965 is not significantly different from 1 and the intercept term is not significantly different from zero. These values suggest that in the post-War period the CSO used the sea and air passenger movement series as a direct indicator of net migration in the identity from which the annual population estimate is derived.¹² There would seem, therefore, to be a very close relationship between the annual net migration estimates and the annual net

12. A time trend, T, was added to the regression equation for the period July 1951-74 to see if, in view of the regression result reported in the previous footnote, it would make a significant difference to the proportion of the variance explained when the cross-Border passenger movement is omitted from the net passenger movement series. The regression equation which resulted is as follows:

$$M_t = -16.887 + 0.653 SA_t + 0.917 T, \bar{R}^2 = .93, S.E.E. 4.9, D.W. 2.13$$

(5.9) (6.1) (3.5)

The proportion of the variance explained has increased from 89 per cent to 93 per cent while the standard error of estimate has been reduced by almost a fifth. Both the sea and air variable (SA_t) and the time trend, T, are significant at the 1 per cent level. The introduction of the time trend, however, leads to a large reduction in the size of the coefficient of the sea and air variable because of the presence of multicollinearity between the two explanatory variables ($r = .84$). A comparison of the above result with Martin's regression equation shows that the use of the sea and air variable and a time trend gives a closer fit than the use of the total passenger movement variable and a time trend. The difference in the signs on the trend term in the two equations probably arises because Martin did not attach negative signs to his net migration estimates as there was no net immigration during the period for which his regression equation was estimated i. e. 1951-71.

passenger movement figures excluding cross-Border passenger movement. There is also a close relationship between the Irish Central Statistics Office series on net passenger movement to Great Britain and the British Office of Population Censuses and Surveys (OPCS) series on net migration to/from the Irish Republic to England and Wales only although the relationship is not as strong as in the case of the annual net migration estimates and the annual net passenger movement figures to all places excluding Northern Ireland. The respective correlation coefficients for the period July 1961 - 73 are $= .81$ and $= .83$.¹³ The correspondence between the Irish CSO's net passenger movement figures to Great Britain and the British OPC's estimate of net migration to England and Wales from the Republic of Ireland is interesting because it suggests that an annual series for net migration from the Republic to Great Britain only could be derived from the existing series on net migration from Ireland to all places including Great Britain. In the past econometric studies of the connections between the Irish and British labour markets, such as those by Walsh (1974) and Geary and McCarthy (1976), have used net migration to/from Ireland to all places outside Ireland as their dependent variable and Irish and British unemployment rates and earnings levels as independent variables in the migration function. If a series on net migration to Britain only was available it should give more precise estimates of the effect of changes in Irish and British unemployment rates and earnings levels on net migration between Ireland and Britain.

Conclusions

Annual net migration estimates for Ireland have been derived for the years 1926-76. While these estimates are regarded as being the least reliable component of the population change identity, they give a reliable picture of the trend in Irish migration behaviour over the last half century. The estimates for the years 1926-71 have benefited from the revisions which took place in the light of each census and they should not be subject to further revision in the future. The estimates for years after

13. The British estimates of net migration to/from the Republic of Ireland to England and Wales are published in Population Trends, Spring, 1977, Table 6.

1971 may be subject to revision after the next census is taken in 1981 but the level rather than the trend is more likely to be affected. The conclusion which the existing estimates for 1971-76 lead to, i. e. that there has been net immigration in each of the years April 1971-76, is unlikely to change as a result of revisions in the future.

The immigration which has taken place in the years 1971-76 is unparalleled in the history of Irish migration in peacetime during the last half-century and there is very strong evidence that this is the first time in the past 150 years that there has been a net inflow of population into the area now covered by the Republic of Ireland, i. e., the twenty-six counties.

The migration experience of Northern Ireland and the Republic of Ireland has had certain similarities during the post-War period. Both were net exporters of their population during most of this time, both had high emigration rates in the mid-fifties which declined during the sixties to relatively low levels and both seemed poised at the beginning of the seventies to move into a position of a zero migration balance. This position has been attained and maintained in the Republic in the last five years but it has not been achieved in Northern Ireland. The violence which broke out in Northern Ireland in 1969 and which has continued and intensified during the 1970's has, it would seem, reversed the pattern of the 1960's and has led to an upsurge in emigration from the area which has brought the migration rate per 1,000 population to its highest level in the last twenty-five years at least.

There is a close association between the annual net migration estimates and the annual net passenger movement figures excluding cross-Border passenger movement over the period 1926-75. Over 70 per cent of the variance in the net migration estimates can be explained by the series on passenger movement excluding Northern Ireland for the years 1926-75. The proportion of the variance explained increases to around 90 per cent if attention is confined to the post-War period and the size of the regression coefficient in the equation for this period indicates that the net migration component in the identity from which the annual population estimate is derived is estimated by CSO from the net passenger movement figures excluding cross-Border passenger movement.

REFERENCES

- Beckett, J. C. (1966). The Making of Modern Ireland, 1603-1923. London: Faber and Faber.
- Bowles, S., (1970). "Migration as Investment: Empirical Tests of the Human Investment Approach to Geographical Mobility", Review of Economics and Statistics, Vol. LII, No. 4.
- Chow, G. C., and Lin, A. L., (1971). "Best Linear Unbiased Interpolation, Distribution and Extrapolation of Time Series by Related Series", Review of Economics and Statistics, Vol. LIII, No. 4.
- Connell, K. H., (1950). The Population of Ireland 1750-1845. Oxford: Oxford University Press.
- Dean, Geoffrey and Mulvihill, C. J., (1972). "The Registration of Births and Deaths in Ireland", Journal of the Irish Medical Association, Vol. 65, No. 5.
- Department of Local Government and Public Health (1930). Annual Report of the Registrar General, 1929. Dublin: Stationery Office.
- Geary, P. T., and McCarthy, C., (1976): "Wage and Price Determination in a Labour Exporting Economy: The Case of Ireland", European Economic Review, Vol. 8, No. 3.
- Hughes, J. G., and Walsh, B. M., (1976). "Migration Flows Between Ireland, the United Kingdom, and the Rest of the World, 1966-1971". European Demographic Information Bulletin, Vol. 7, No. 4.
- Ireland, (1955). Commission on Emigration and other Population Problems, 1948-1954, Reports. Dublin: Stationery Office.
- Ireland, (1976) Green Paper, Economic and Social Development 1976-1980. Dublin: Stationery Office.
- Keating, W., (1977). "An Analysis of Recent Demographic Trends with Population Projections for the years 1981 and 1986" Journal of the Statistical and Social Inquiry Society of Ireland (forthcoming).
- Martin, J. (1975). Some Aspects of Labour Market Integration: The Anglo-Irish Labour Market in the Post-War Period. Nuffield College, University of Oxford: Unpublished Ph.D. thesis.
- O'Herlihy, C. St. J., (1966). A Statistical Study of Wages, Prices and Employment in the Irish Manufacturing Sector. Dublin: Economic Research Institute (now The Economic and Social Research Institute).
- Walsh, B. M. (1968). Some Irish Population Problems Reconsidered. Dublin: The Economic and Social Research Institute.
- Walsh, B. M., (1974). "Expectations, Information, and Human Migration: Specifying an Econometric Model of Irish Migration to Britain", Journal of Regional Science, Vol. 14, No. 1.
- Walsh, B. M. (1975). Population and Employment Projections: 1971-86. Dublin: National Economic and Social Council, Paper No. 5.
- Walsh, B. M. (1976). "Unemployment Compensation and the Rate of Unemployment; The Irish Experience". Paper read to Conference on Unemployment Compensation and Unemployment Rates, Simon Fraser University, Vancouver, Canada, 1-4 September 1976 (forthcoming).