Ireland's Demographic Transformation, 1958-70

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In the early 1960's Ireland's marriage rate was very low and marriage fertility very high by European standards. The marriage rate had, however, been rising since the 1940's, especially when expressed in terms of the unmarried population. In the absence of a substantial fall in average family size the prospect was that the rising proportions married in each age group would lead to a significant increase in the birth rate. This prospect was explored in detail in [20].

It is still too early to attempt a definitive commentary on the demographic history of the 1960's in Ireland—this could not be undertaken before the publication of the relevant results from the 1971 Census of Population. On the basis of registration statistics for births and marriages, however, it is possible to piece together the broad outline of the evolution of events since 1958. The annual (and for some series quarterly) data available on vital statistics have one advantage over the otherwise more refined Census data, namely, they elucidate the exact timing of turning points. The importance of such demographic turning points to educational, housing and labour force planning is obvious and illustrated in some recent Irish studies [6], [10], [14].

The number of marriages registered[1] in the Republic of Ireland in each year and quarter 1958–70 is shown in Figure 1 (the data are contained in Appendix III, Table A1). The relative stability in the numbers for the years 1958–63 conceals the fact that the rate per 1,000 unmarried adults was probably rising steadily over this period (see Table 4, below). The annual totals rose sharply after 1963, and the figure for 1970 was 25 per cent above that for 1963. This upward trend in marriages was accompanied by a falling median age at (first) marriage, as is shown in Figure 3: between 1958 and 1968 median bridal age fell from 25·7 to 23·9 years.[2] Obviously these changes in marriage patterns would have had a

1. For the years 1958–69 inclusive Irish vital statistics were tabulated in both [7] and [8] by year or quarter of registration (as distinct from occurrence). In 1970, for the more detailed tabulations presented in [7], a change has been made and the tables are by year of occurrence. This means that for some of the data used in the present paper the 1970 figure is not strictly comparable with the entries for earlier years: where relevant, attention has been drawn to this fact in the Tables.

2. Age at marriage, and relative age at marriage, in post-war Ireland have been studied in detail elsewhere [21].

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Fig. 1: MARRIAGES. Annual and Quarterly (Seasonally corrected, moving 3-quarter average).
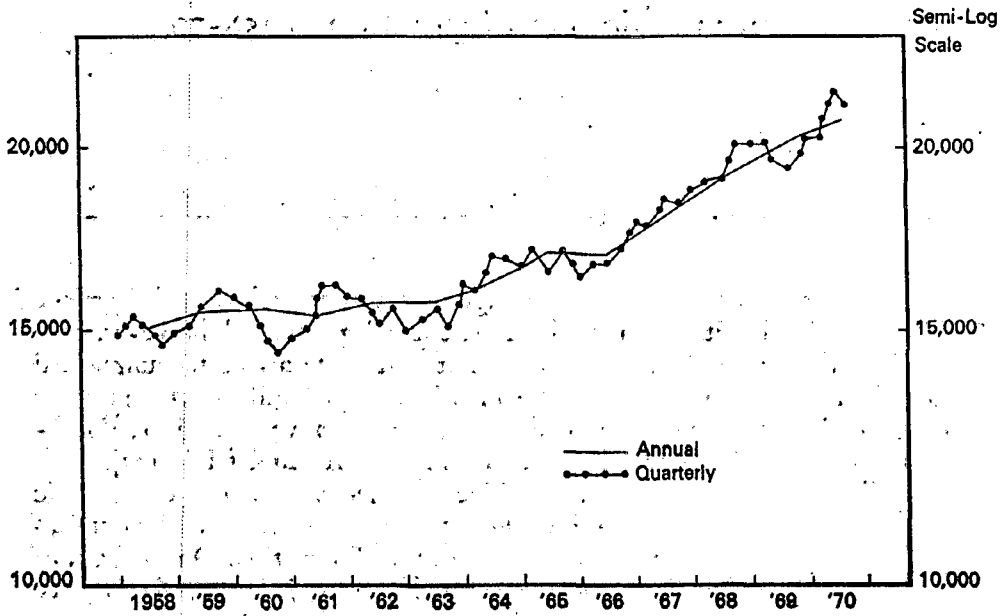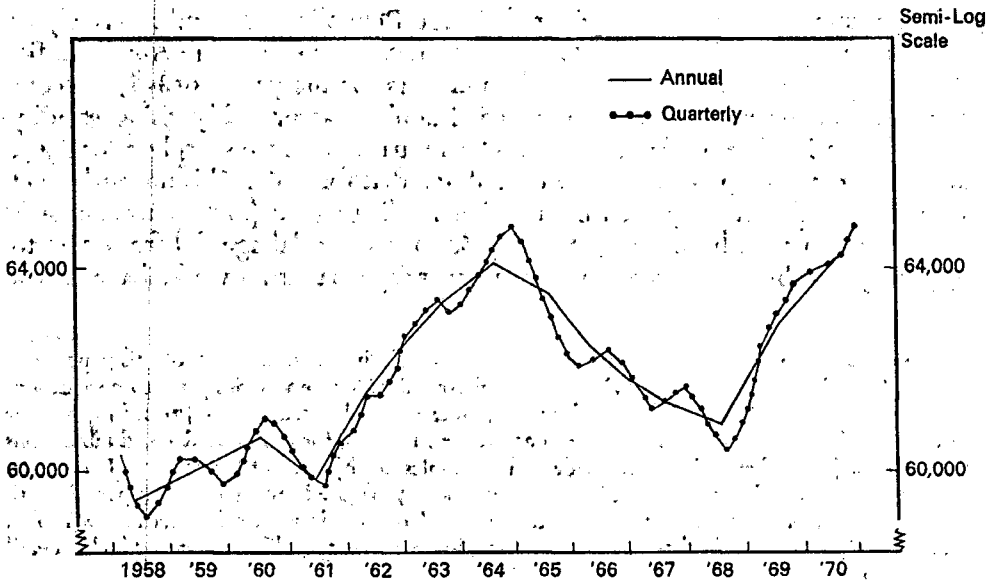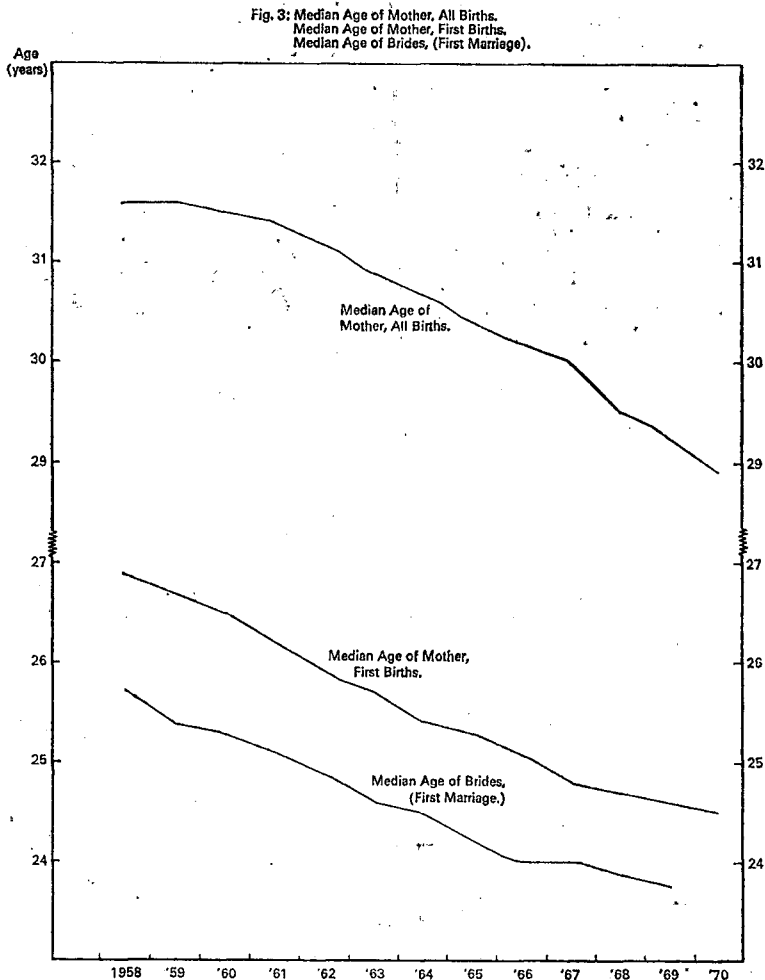

Fig. 2: BIRTHS. Annual and Quarterly (Seasonally corrected, moving 3-quarter average).

Fig. 3: Median Age of Mother, All Births.
Median Age of Mother, First Births,
Median Age of Brides, (First Marriage).

Age
(years)

Median Age of
Mother, All Births.

Median Age of Mother,
First Births.

Median Age of Brides,
(First Marriage.)

1958 '59 '60 '61 '62 '63 '64 '65 '66 '67 '68 '69 '70

major impact on the birth rate in the absence of any change in marital fertility. As may be seen from Figure 2 (Table A2)[3] up to 1964 there was a strong upward trend in births over the years 1958–64. In 1964, however, precisely when the accelerated rate of increase in marriages should have begun to affect the number of births, there was a sharp turning point and the number of births fell in each of the years 1965–68. If the 1961–64 rate of increase had been maintained for the years 1964–68, the 1968 total would have exceeded 70,000 compared with the actual total of 60,000. In the light of the marriage boom of the late 1960's the significance of the 1964 turning point for births is even greater than suggested by a shortfall of 10,000 births (or 17 per cent) in the 1968 total. After 1968 the number

3. Figure 2's scale is truncated in order to magnify the amplitude of the fluctuations.

of births registered rose again and by 1970 had regained its 1964 peak, but was still considerably below the number expected on the basis of the increased marriage rate and a constant fertility of marriage. The instability of the Irish birth rate during the 1960's was commented on in [2].

In order to understand these rather wide swings in the number of births recorded since 1958, detailed classification of the data is helpful. In Figure 4 (Table A3) the annual totals are broken down between first, second, third and fourth or later, children. First and second births have been rising more or less steadily since 1961. Births to women who have already had at least three children increased up to 1964 but have fallen uninterruptedly since then. (As may be seen from Table A3 this is true of fourth and fifth, as well as higher order, births). It is now evident
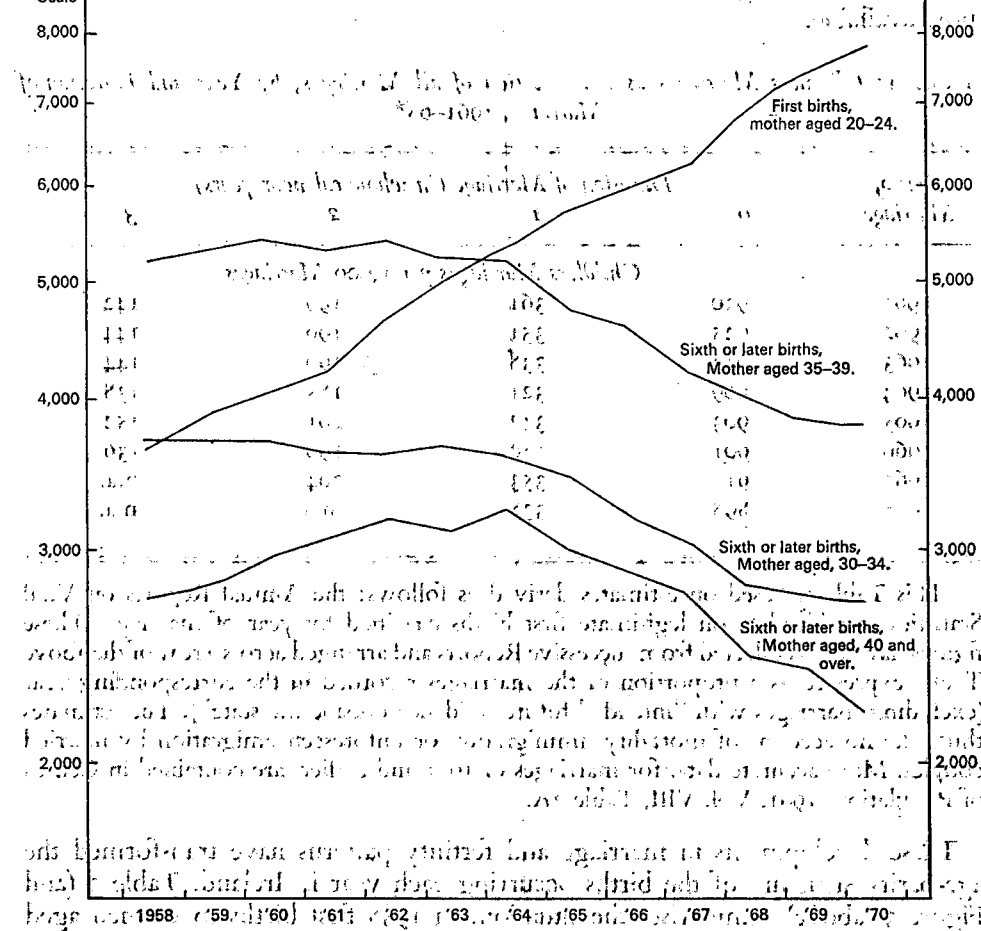

Fig. 4: BIRTHS classified by number of previous liveborn children (annual data).

Fourth or later births

First births

Second births

Third births
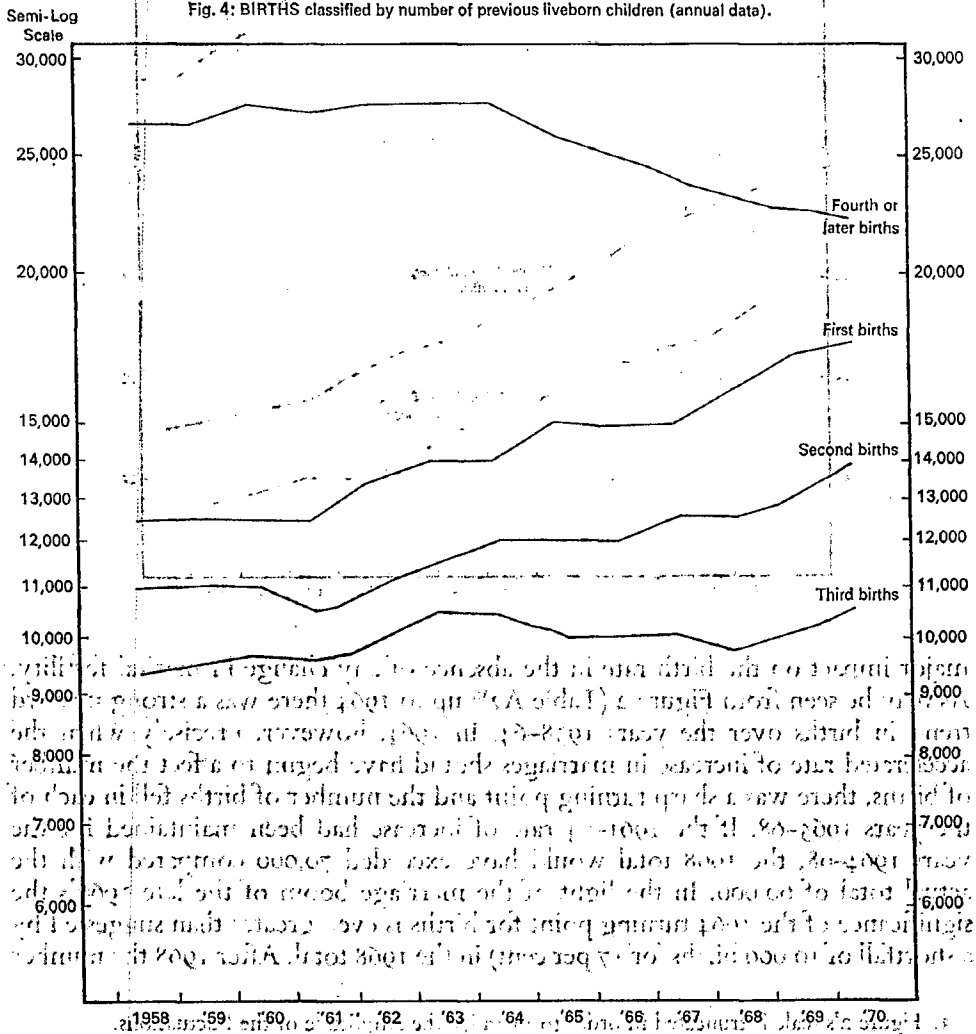
that the dramatic peak in total births in 1964 was due to a sharp decline in the number of higher order births in the subsequent years. The upturn in the total figure after 1968 was not due to a reversal of the downward trend in higher order births, but to an acceleration in the rate of increase of first and second births. If births are studied by age of mother as well as birth order even more dramatic contrasts emerge. Figure 5 (Table A4) presents details for a selected number of series. The number of first births to mothers aged 20–24 more than doubled between 1958 and 1970, whereas the number of sixth and later children born to women aged 40 and over fell by one third between 1964 and 1970.[4] First births may be studied in greater detail to assess whether any changes have

Fig. 5: BIRTHS classified by age of mother and number of previous liveborn children (annual data).

Semi-Log Scale

First births, mother aged 20–24.

Sixth or later births, Mother aged 35–39.

Sixth or later births, Mother aged, 30–34.

Sixth or later births, Mother aged, 40 and over.

1958 '59 '60 '61 '62 '63 '64 '65 '66 '67 '68 '69 '70

4. An attempt to convert these crude figures into rates per 1,000 "at risk" is presented in Appendix I.

occurred in the average interval between marriage and the birth of the first child. In Table 1 evidence on this point is presented. Each column of the Table shows the proportions of the marriages occurring in each year since 1961 that were childless at the end of the specified number of years (the results are subject to the important reservation contained in the note to the Table). Allowing for data imperfections, the stability of the interval between marriage and the first birth is striking: it seems that about 10 per cent of marriages result in a live birth in the calendar year of the marriage, 65 per cent by the end of the following year, and 80 per cent by the end of the second year. There is some tendency towards a smaller percentage of childless marriages at the end of the decade, as would be expected in view of the declining bridal age. Thus, the forces that lowered the fertility rate among older married women with large families had no appreciable effect on the timing of the first birth, as far as can be concluded from the data now available.

TABLE 1: *Childless Marriages as a Proportion of all Marriages, by Year and Duration of Marriage, 1961–68**

Year of Marriage	Duration of Marriage (in whole calendar years)			
	0	1	2	3
	Childless Marriages per 1,000 Marriages			
1961	930	361	199	142
1962	925	351	196	144
1963	914	338	190	144
1964	909	321	185	138
1965	903	342	201	152
1966	901	340	190	136
1967	911	353	204	n.a.
1968	898	338	n.a.	n.a.

*This Table is based on estimates derived as follows: the Annual Reports on Vital Statistics provide data on legitimate first births classified by year of marriage. These figures have been collected from successive Reports and arranged across a row of the above Table, expressed as a proportion of the marriages recorded in the corresponding year (excluding marriages with "intended future residence outside the state"). The estimates thus take no account of mortality, immigration or unforeseen emigration by married couples. More accurate data, for marriages of 1961 and earlier, are contained in Census of Population, 1961, Vol. VIII, Table 2A.

These developments in marriage and fertility patterns have transformed the age-parity structure of the births occurring each year in Ireland. Table 2 (and Figure 3, above) summarises the situation. In 1958 first births to women aged 20–24 accounted for only 6 per cent of all births compared with 12 per cent in 1970; at the other extreme, births to women with five or more previous children.

TABLE 2: *Percentage Distribution of Births classified by Age of Mother and Parity, 1958 and 1970 (excluding "not known")*

| | Number of Previous Live-Born Children | | | | | | | | | | | | |
| | 0 | | 1 | | 2 | | 3 | | 4 | | 5 or more | | All Parities | |
Age of Mother	1958	1970	1958	1970	1958	1970	1958	1970	1958	1970	1958	1970	1958	1970
Under 20	1·0	2·6	0·3	0·6	0·1	0·1	—	—	—	—	—	—	1·4	3·3
20–24	6·1	12·2	3·8	6·6	1·9	2·7	0·8	0·9	0·3	0·3	0·1	0·1	13·0	23·0
25–29	7·2	8·0	7·0	8·6	4·9	6·2	3·1	3·4	1·9	1·6	2·1	1·5	26·2	29·4
30–34	4·1	2·7	5·1	3·9	5·5	5·0	4·6	4·4	3·2	2·8	6·3	4·2	28·8	23·2
35–39	1·8	1·0	2·2	1·5	2·9	2·1	3·4	2·4	3·0	2·3	8·8	5·9	22·1	15·2
40 and over	0·4	0·3	0·6	0·4	0·8	0·4	1·0	0·7	1·1	0·8	4·7	3·4	8·6	5·9
All Ages	20·4	27·0	19·0	21·6	16·1	16·6	12·9	11·8	9·5	7·8	22·0	15·2	100·0	100·0

Notes: 1958 data refer to year of registration, 1970 to year of occurrence. Minor discrepancies in the total are due to rounding.
Data Source: [7].

declined from 22 per cent in 1958 to 15 per cent in 1970. The trend towards younger, lower parity maternities is very pronounced and of great medical and social significance. Median age at maternity (for births of all orders) has fallen by almost three years since 1958, due both to earlier marriage and to the apparent fall in completed family size. The last pregnancy of the typical Irish women who married in 1970 will probably occur four or more years earlier than was the case for her counterpart who married in 1958. This fall in the age at which women have completed their child-bearing is of great importance to the role of women in society and in the economy.

The major reduction in marriage fertility that has occurred in Ireland since the mid-1960's immediately suggests that the anovulant pill had a significant impact on Irish birth control practices. Unfortunately we have no data on the use of the pill or other methods of contraception in Ireland, so that it is not possible to document the extent to which the fall in fertility is due to the adoption of the pill or to increased use (or effectiveness) of more traditional methods. It is, however, instructive to relate the Irish experience to the evidence available in countries where field survey work has documented the impact of the pill.

In Britain it has been found that "the great change since 1961 has been in the adoption of the 'pill' " [3, p. 18]. An English doctor recently commented "since 1964 the numbers of women having their fourth or more child have been declining steadily. The grand multipara is rapidly disappearing from our maternity wards, and women having their fifth or later pregnancy now represent less than 7 per cent of total births" [15, p. 268]. The American evidence suggests that the pill was adopted both by women who were previously using other, less effective, methods of contraception and by women for whom the pill was the first method tried [22]. The data on the practices of US Catholics is even more relevant to the Irish case. In 1969 it was found that 37 per cent of married, fecund Catholic women were using the pill, as compared with 14 per cent in 1965:

> For the first time we can record that not only is the pill more popular among Catholics than all other non-approved methods but that, even allowing for the slight sampling bias in its favour, it may now exceed rhythm as the most popular method used by Catholics. . . . Our most conservative conclusion is that the Papal Encyclical has certainly had no effect in the sense of reversing the trend towards non-conformity (with the Church's teaching) and has probably not even slowed it down. [23, pp. 4, 5].

Further indirect evidence of the impact of the pill in Ireland may be gleaned from a comparison of Irish birth data with those for Britain (where the impact of the pill has been directly substantiated). The coincidence of turning points in both parts of Ireland, Scotland, and England and Wales, evident in Figure 6 (Table A5) is remarkable. The rate of decline in the Republic between 1964-68 was roughly equal to that recorded in the three other areas. (Of course the 1968 upturn was confined to the Irish data, since the other areas did not experience a comparable marriage boom). A similar downturn in or after 1964 has been

experienced in the Netherlands, France, Belgium, Germany, Sweden and Italy: as one commentator has written "the movement is striking as much in its generality as in its amplitude" [16, p. 11].

The upturn in the Irish total of births in 1968 does not seem related to the Papal pronouncement on contraception. In the first place, the quarterly data suggest that the upward trend started in the fourth quarter of 1968, too early to reflect the impact of the Encyclical on conceptions. Secondly, the number of higher

Fig. 6: BIRTHS in the Republic of Ireland, Northern Ireland, Scotland, and England and Wales (Centered 4 quarter moving totals of uncorrected quarterly data).
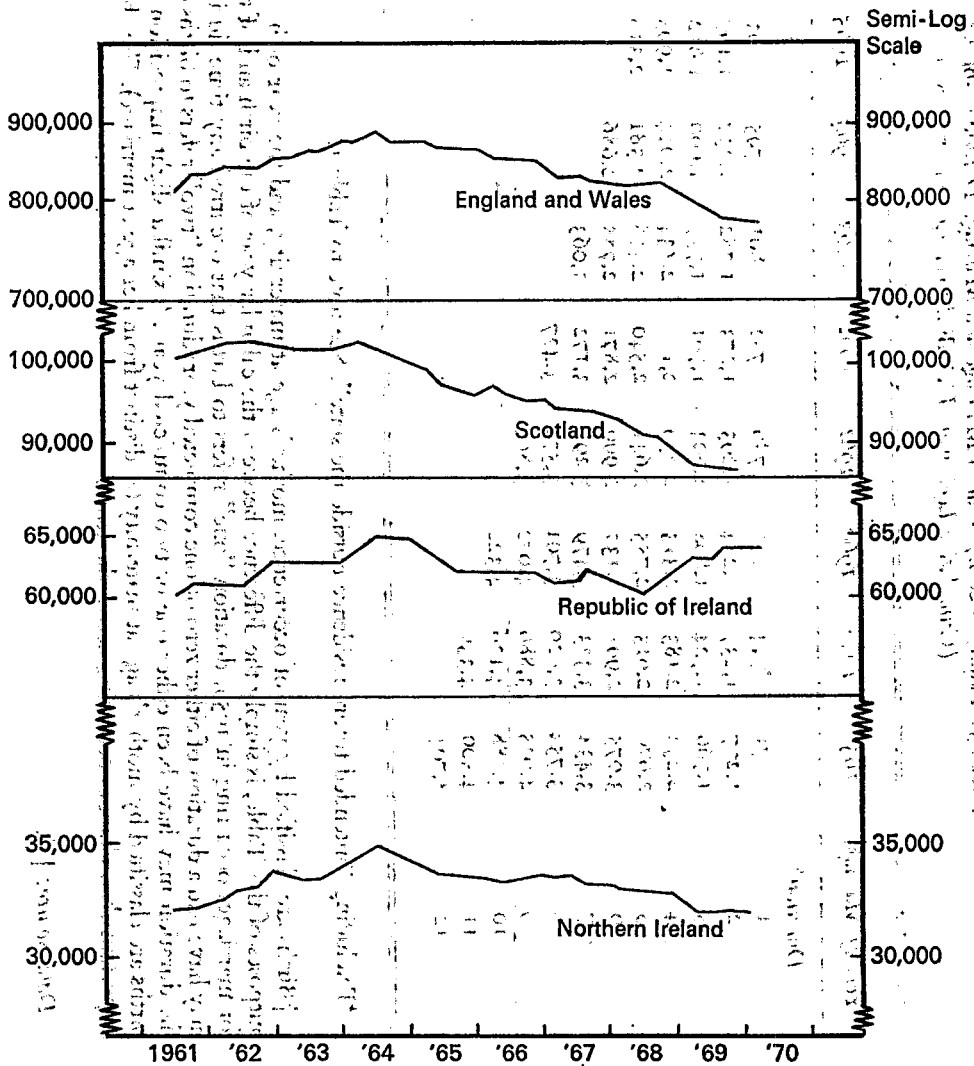
TABLE 3: *Family Size By Year of Marriage and Marriage Duration—Brides Aged 20-24*
(Cumulative Legitimate Live Births per 1,000 marriages*)

Year of Marriage	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967	1968
Duration†											
1	771	744	777	786	782	801	795	763	785	769	758
2	1,277	1,237	1,284	1,293	1,273	1,282	1,237	1,197	1,227	1,198	1,169
3	1,766	1,724	1,808	1,803	1,761	1,737	1,660	1,612	1,664	1,598	
4	2,232	2,183	2,313	2,259	2,177	2,134	2,044	1,995	2,037		
5	2,679	2,613	2,755	2,641	2,540	2,478	2,381	2,318			
6	3,075	2,991	3,137	2,999	2,871	2,785	2,686				
7	3,434	3,323	3,479	3,294	3,172	3,063					
8	3,752	3,620	3,791	3,572	3,427						
9	4,025	3,886	4,072	3,809							
10	4,288	4,126	4,322								
11	4,509	4,339									
12	4,704										

*Excluding "intended future residence outside the state". See note to Table 1.

†Births are classified by year of occurrence, mother's age at maternity, and the year of her marriage. Duration, for the purposes of this Table, is simply the difference between the calendar year of the birth and of the mother's marriage. Thus, for marriages occurring in 1958, duration "one" refers to births that occurred any time during 1959, when the marriage may have had a duration of either zero or one completed year; duration "two" refers to births occurring during 1960, when the duration may have been either one or two completed years. A similar slight imprecision also arises from the fact that births are classified by mother's age at maternity (as distinct from her age at marriage). The absolute level of the data is less important than changes occurring across the rows.

Data Source: [7].

order births continued to decline after 1968, and the upturn in the total was entirely. due to the increase in first and second births (which are least likely to be affected by birth control practices). Thus the Encyclical did not reverse the downward trend in marriage fertility that began in 1964.[5]

A difficulty arises in connection with the interpretation of short run movements in fertility: it is not possible to tell whether a sudden decline in the number of births occurring in a particular year represents a fall in average family size or merely a change in the spacing of births. Full evaluation of these trends requires data on the number of children born to women marrying in various years, arranged by duration of marriage. Due to the unavailability of data for Ireland before 1956, and the heavy emigration of the period 1956-58, only a limited time-span can be studied in this detail. The relevant data are presented in Table 3.

It is clear from Table 3 that a sharp break in fertility occurred among those who married after 1960. With the exception of the first two or three years of marriage, reductions in the rate of family formation are evident for all marriage durations. the number of children per 100 marriages has in general fallen by between 10

Fig. 7: BIRTHS classified by area of residence of mother (Centered 4 quarter moving totals of uncorrected quarterly data).
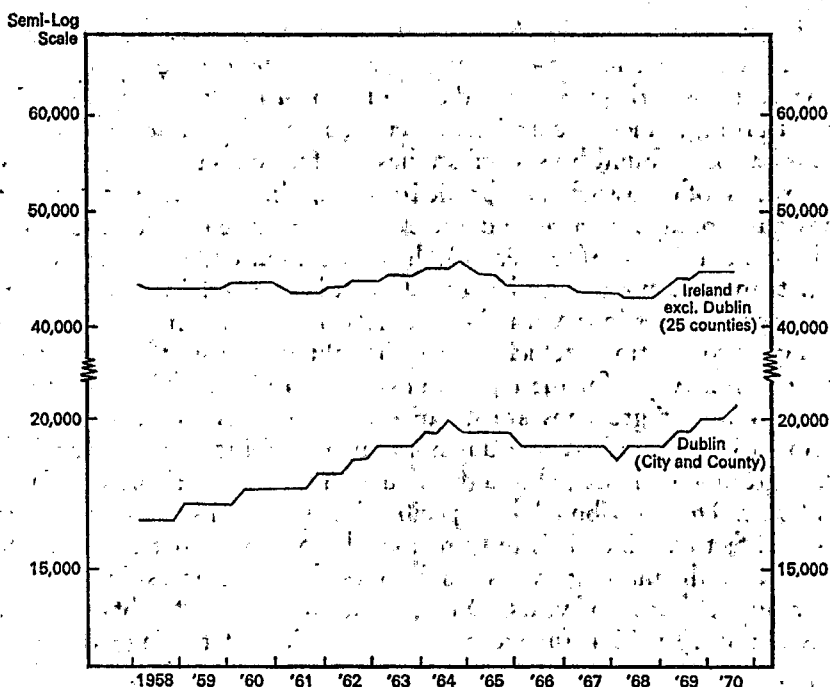
5. A final consideration is the influence of the health scare regarding the pill. The publication of the Dunlop Committee's report is generally credited with the rise in births in Britain since the third quarter of 1969.

and 15 per cent, comparing marriages of 1960 with the latest available year. It is striking, for example, that after seven years of marriage, brides aged 20–24, there were 310 children per 100 marriages of 1963, compared with 350 per 100 marriages of 1960. As data accumulate for successive years it will be possible to distinguish more clearly between changes in the spacing of a family of a given size and a decline in completed family size.

It would be very interesting to study these trends by social class and to identify which groups have contributed most to the change. The only evidence available on this topic is very indirect and derives from a regional breakdown of the birth data. In Figure 7 (Table A6) data are presented for Dublin and the remaining 25 counties (a more-refined analysis by size of town proved impossible due to boundary changes since 1958). The peak occurs slightly earlier in Dublin than in the rest of the country; but it appears equally significant in both areas. The Dublin area, of course, was experiencing a much more rapid population growth over these years and this tends to flatten the peak: on the whole, it seems plausible to conclude that the changes in fertility patterns that took place in the mid-1960's were about equally important in Dublin and in the remainder of the Republic.

Factors affecting the Marriage Rate

An estimate has been made of the annual marriage rate per 1,000 unmarried population aged 15–64, and is presented in Table 4.[6] There is clearly some association between the marriage rate and the condition of the Irish economy. This is scarcely surprising, since a correlation between marriage rates and economic conditions has been found by several studies in other countries. [12] In order to test the closeness of the association for the Irish data a limited number of regression equations have been estimated and the results are presented in Table 5. Real personal disposable income (per person), the non-agricultural unemployment rate, and the net emigration rate have been used as indicators of Irish economic conditions. In simple regressions with the marriage rate, only the income variable yields a higher correlation coefficient than that obtained from the use of a simple linear time trend. A test for the randomness of the residuals (Geary's tau) shows that all the simple regressions are unsatisfactory on this score. There is some improvement in the results when unemployment and income are included in a multiple regression equation, although the unemployment variable's coefficient is not significant. The distributed lag specification (equations 6 and 7) is perhaps the most satisfactory, since it is only reasonable to expect that the influence of rising income on the marriage rate should not be felt more or less instantaneously but rather over a period of years. On the other hand, the R^2 obtained in these equations is not very high (in view of the inclusion of the lagged dependent

6. The basic procedure was (i) to obtain estimates of the population by age for intercensal years and (ii) to break this down by marital status. For the years 1952–60, the labour force data in [9] were used to interpolate the census data on the population in the active age group. The marital status of the active age group was estimated by linear interpolation of the percentage married at the Census dates.

variable), and in all cases there are large, positive residuals for each of the three terminal years of the sample period. Thus it seems that the sharp rise in the marriage rate during the years 1967-69 represented a departure from the pattern established over the entire sample period, 1951-69: the association between economic variables and the marriage rate that prevailed up to 1967 would not have led us to expect the accelerated rise in the rate that occurred after 1967.[7]

TABLE 4: *Annual Marriage Rate Per 1,000 Estimated Unmarried Population Aged 15-64*

Year	Marriage Rate
1951	16·0
1952	16·1
1953	16·4
1954	16·5
1955	17·4
1956	18·2
1957	16·4
1958	17·2
1959	17·9
1960	18·3
1961	18·5
1962	18·9
1963	18·8
1964	19·4
1965	20·5
1966	20·4
1967	21·6
1968	23·1
1969	24·2

The fact that this sharp rise in the marriage rate, which would not have been predicted on the basis of economic factors, occurred so soon after the equally dramatic decline in fertility is very striking. There is a well-documented negative correlation between marriage rates and marriage fertility, which has been supported with data on Irish counties, Irish social classes and the countries of Europe in [20]. It would certainly be consistent with the evidence from Irish demographic history to maintain that the abrupt fall in Irish fertility, dating from 1964, acted as a major stimulant to Irish marriage rates.

In the absence of survey data on the factors influencing marriage intentions our evidence remains indirect. There is, however, a considerable body of demo-

7. There is the possibility that the sharp fall in emigration in recent years has swollen the number of young people of marriageable age in the country. The fall in emigration in the late 1960's, however, seems due more to the rise in British unemployment than to the growth of employment opportunities here, and hence is unlikely to have directly impinged on the number of marriages.

TABLE 5: *Regression Results with Marriage Rate as Dependent Variable*

Dependent Variable	Independent Variables' Coefficient (t-test in parenthesis)						R²	Geary tau
Annual Marriage rate per 1/000 Unmarried population 14–64, 1951–69	Non-ag. Unemployment Rate	Real Personal Disposable Income per head	Net Emigration Rate	Trend	Lagged Dependant Variable			
Equation No. 1	—1·11 (3·18)						·373	7
2		0·069 (15·58)					·935	5
3			—0·207 (3·89)				·471	3
4				0·389 (10·43)			·865	2
5	0·196 (1·29)	0·074 (12·36)					·941	8
6		0·044 (2·84)			0·427 (1·69)		·945	7
7	0·108 (0·65)	0·051 (2·62)			0·35 (1·22)		·946	7

graphic writing that would predict that the adoption of a new, effective method of contraception would facilitate the country's transition from a "low nuptiality-high fertility" to a "high nuptiality-low fertility" strategy. As a recent commentary on Irish demographic history pointed out: .·.

> What is demographically interesting about Ireland is that it demonstrates the relative ineffectiveness of a later age at marriage and a larger proportion unmarried as against contraception and abortion as regulators of marital fertility. . . . The postponement of marriage on even such a drastic (and, one might argue, socially demoralising) scale as practised by the Irish is less efficient and humane than encouraging contraception . . . [4 p. 29].

The Irish experience since 1958—where a 40 per cent rise in the marriage rate has not been accompanied by a significant rise in the birth rate, apparently because of the diffusion of an effective method of birth control, is eloquent testimony of the validity of this assertion.[8]

The Future

We tend to look to other European countries with a similar, or higher, income level to find pointers to the probable evolution of Irish society. However appropriate or otherwise this procedure may be, in the demographic field such comparison has always revealed very striking dissimilarities between Ireland and the rest of Europe. The recent fall in age at marriage, and rise in the marriage rate, has narrowed the gap between Ireland and the rest of the world in regard to nuptiality. It is still too early to say whether the changes that are taking place in regard to marital fertility will be large enough to bring Ireland into conformity with other European countries in this regard. It has been stressed above that the pill had a marked impact on all major European countries, and it is too early to see whether the final impact on contemporary Irish marriages will be strong enough to reduce or even close the gap between Ireland and the rest of Europe.

To gain some idea of the contrast in fertility patterns between Ireland and Europe, the data of Table 6 may be considered. The first column reflects both marriage rates and marital fertility, and shows that Ireland has by far the highest number of children born per 1,000 women passing through the reproductive age interval at present fertility and marriage rates. If we confine our attention to the married population, and consider the index of marital fertility presented in column 2 of the Table, the contrast between Ireland and the rest is even more pronounced. Similarly, the measure of replacement provided in column 3 (which is independent of the present age structure of the population) shows that Ireland has by far the highest growth potential of all the countries listed, with an "intrinsic

8. A further possibility should be mentioned. With a sudden fall in the proportion of each cohort remaining in lifelong celibacy, it is possible that marriage becomes less selective of certain traits in the population. It has been speculated in [20] that in the past the Irish married population had been "selected" from each cohort at least partly on the strength of their desire to have children. If there is any truth in this, then a fall in the selectivity of marriage could lead to a reduction in average fertility.

growth rate" of approximately 2 per cent per annum, compared with some of Eastern European countries, or Japan, where present fertility rates would eventually lead to stationary or declining populations. Thus, even in the late 1960's, taking account of the immediate effects of the recent fall in Irish fertility, the contrast between Ireland and the rest of Europe was very great.

TABLE 6: *International Comparison of Measures of Fertility and Replacements*

	Average Number of Children per Woman (married plus single)* 1965	Legitimate live births per 1,000 married women Aged 10–49 (1968)**	Net Reproduction Rate (1968)***
Ireland	3·84 (1968)	190	1·75
New Zealand	3·32	155 (1961)	1·50
Canada	3·18	88	1·14
Portugal	3·12 (1964)	129	1·36
Netherlands	3·03	119	1·29
Australia	2·97	110 (1966)	1·34 (1967)
Scotland	2·95	111	1·30
U.S.A.	2·93	133 (1960)	1·21 (1967)
France	2·83	106 (1967)	1·26
England and Wales	2·81	97	1·24 (1967)
Belgium	2·73	106 (1961)	1·13 (1967)
Yugoslavia	2·71	122 (1967)	1·11 (1967)
Austria	2·69	102	1·20
Italy	2·67 (1964)	113 (1967)	1·15 (1966)
Denmark	2·60	106 (1966)	1·24 (1966)
Finland	2·52 (1964)	107 (1967)	1·06 (1967)
Switzerland	2·52	117 (1960)	1·11 (1967)
Czechoslovakia	2·50	86 (1967)	0·94
Poland	2·50	130 (1960)	1·04
Germany, West	2·50	103 (1967)	1·11
Germany, East	2·50	85 (1967)	1·10 (1967)
Sweden	2·40	89 (1967)	1·12 (1966)
U.S.S.R.	2·38	N.A.	N.A.
Greece	2·23 (1964)	100 (1961)	1·07
Bulgaria	1·99 (1966)	71 (1965)	1·06
Rumania	1·93 (1964)	N.A.	1·65 (1967)
Hungary	1·80	79	0·95
Japan	2·14	109 (1965)	1·05
Spain	N.A.	142 (1960)	1·38

*Based on 1965 age-specific total fertility rates. Source: [16, Table 11·1].
**Source: [18, Table 26].
***Source: [18, Table 31] A value above unity implies that, at present fertility and mortality rates, population would grow by a proportion equal to the excess over unity per generation (is a hypothetical stable population).

The final implications of the recent fall in Irish fertility will not be apparent until the generation that married in the 1960's has completed its family formation. The fall in higher order births to older women documented in the present paper may merely indicate that the incidence of large families (six or more children) will fall dramatically as effective birth control is resorted to with increasing frequency once a certain family size is reached. This is perhaps the minimum impact that the diffusion of the pill will have. Even this would tend to reduce the pronounced social class differentials in family size that are a prominent feature of the Irish demographic situation today, but which have virtually disappeared elsewhere in Europe. Alternatively, the recent reduction in fertility may presage a general reduction in desired family size, and increasing resort to contraception to achieve this new norm.

Although demographers and economists have not yet provided a generally accepted theory of the determinants of human fertility,[9] it is clear that many changes are occurring in Irish life that raise the economic (or opportunity) costs of high fertility. Recent studies on the comparative standard of living (in economic goods and services) of couples with and without children have shown that,

> . . . in families with three children under ten years of age (only one parent earning), when the head of the family is a skilled worker in the electrical engineering industry, for instance, the standard of living index by comparison with a childless couple (both earning) was as follows in 1969: West Germany 33, Belgium 39, France 40, Great Britain 39, Poland 34, Sweden 33. The standard of living of families with three children is thus roughly one-third that of a couple without children! [16, p. 142].

Clearly, unless the couple has a very strong preference for children over the material blandishments of the economic system, the pressure to limit family size is immense. As the same author commented: "It is hard to see how families of modest means can have more children, so long as these conditions prevail."

The industrialisation of a society reduces the economic value of young children (who might have helped on farms, or in other family business), raises the costs of educating them, increases the opportunities for mothers to work outside the home (thereby increasing the opportunity costs of staying in the home to care for children), and generally encourages parents to devote their income to less time intensive forms of consumption than child-rearing. Ireland has undoubtedly entered along the path of industrialisation, and hence the economic and social environment will increasingly penalise the high fertility family. It is against these developments (whose desirability economists and others question with increasing frequency) that the recent fall in fertility must be considered.

9. This topic is very clearly discussed in [4, Chapter V].

I

Summary and Conclusions

The main findings of a survey of the vital statistics for the period 1958–70 were:

1. The Irish marriage rate has shown a strong upward trend since 1958, with a dramatic acceleration occurring after 1966. The marriage rate (per 1,000 unmarried adults) rose by at least 20 per cent between 1966 and 1970, and by over 40 per cent between 1958 and 1970.

2. The total number of births reached a peak in 1964, fell by about 6 per cent between 1964 and 1968 and by 1970 had regained the 1964 peak.

3. Underlying these movements in the total number of births have been opposing trends in first, second and third, compared with higher order, births. Births of fourth and later children reached a peak in the early 1960's, have declined steadily since then, and by 1970 were about 20 per cent below their peak levels. The number of first and second births, on the other hand, have grown rapidly during the 1960's, more or less in pace with the growth in the married population. In 1970 there were twice as many first births to mothers aged 20–24 as in 1958, but the number of sixth or later children born to women aged 40 and over was 30 per cent below its 1964 peak level.

4. There is no evidence, as of 1968, that the average interval between marriage and the birth of the first child is lengthening.

5. The downturn in the total number of Irish births in 1964 was due to a fall in higher order births to older women, the upturn in 1969 to a sharp increase in first births. A similar downturn occurred almost simultaneously in Britain and Northern Ireland. Survey work in Britain attributes the 1964 downturn to the influence of the contraceptive pill.

6. On a regional basis within Ireland, the 1964 turning point appears to have been about equally significant in Dublin and the remainder of the Republic.

7. There is no evidence that the Papal Encyclical of 1968 arrested or reversed the downward trend in higher order births in Ireland.

8. The rise in the marriage rate since 1951 has been fairly closely in line with improvements in the economic situation, but the post-1966 acceleration is not readily attributed to economic factors. It is consistent with the evidence to maintain that the abrupt fall in marital fertility in the mid-1960's influenced the marriage rate by increasing young people's willingness to start their family formation in the knowledge that their completed family size might be more effectively controlled than has been the case in the past.

9. The economic and social environment in Ireland has been changing in a manner that tends to increase the economic costs of child-rearing. The outlook for the future is that further significant reductions in fertility will take place, perhaps sufficient to narrow the gap between Ireland and the rest of Europe in this regard.

APPENDIX I

Fertility Rates

In the text of the present article, discussion has been limited to trends in the number of births. It is naturally more instructive to consider rates rather than numbers. A methodology has been developed in [5] for calculating year by year the probability that a family of a given size will be enlarged by an additional birth. These "probabilities of increase in family size" (*probabilités d'agrandissement*) ideally require data on the spacing of successive births for their calculations—data that are not available for Ireland. The calculations below are based on weights supplied by R. Pressat (in *L'Analyse Démographique* (Paris, 1969), p. 318) for a moderately high fertility country: they can only be regarded as approximations, in view of the absence of data on spacing, and because of the complications introduced by emigration in the Irish context.

The reductions observed between 1963 and 1970 are substantial, especially in view of their cumulative nature: at 1963 rates, out of every 1,000 families with one child 398 would eventually have a sixth child whereas at 1970 rates this had fallen to 234 out of every 1,000.

Probability of Increase,

Family of Size (Live Births)

	1	2	3	4	5	6	7
1963	·897	·948	·819	·782	·731	·709	·670
1970	·875	·850	·759	·666	·622	·609	·625

Decline, 1963-70

1	2	3	4	5	6	7
2%	10%	7%	15%	15%	14%	8%

APPENDIX II

Seasonality in Irish Vital Statistics

Quarterly data on marriages and births are published in [7], [8]. Up-to-date commentary on the trend in these series requires that some account be taken of the obvious seasonality in the data. The simplest method of allowing for the seasonal pattern consists in comparing one quarter in one year with the same quarter in another year. Alternatively, moving four-quarter totals or averages may be used. More elaborate methods are used by economists, mostly based on the ratio-to-moving-average method. The

seasonally adjusted data in Tables A1 and A2 have been calculated by the Leser technique [13]. The original seasonally adjusted series for both births and marriages displayed very jagged patterns, and therefore three-quarter-moving averages of the seasonally adjusted data have been used. It is recognised that a series as far removed from the original data as this must be treated with caution, especially if it is desired to locate turning points.

A complication of the Irish vital data is that the quarter of registration, and not of occurrence, is the time interval used in compiling the published figures. How important this qualification is—and whether or not the lag between the event and its registration has varied over our period—is impossible to ascertain without a detailed investigation of the records.

The seasonal factors obtained for births and marriages (to be applied to the year 1971) were as follows (average for the year=100):

Quarter:	I	II	III	IV
Births	98·4	107·5	101·8	92·2
Marriages	80·6	87·4	147·2	84·8

The third quarter appears overwhelmingly the most popular for marriages, the first quarter the least. It is possible that delayed registration (of June marriages) tends to exaggerate the third quarter peak in marriages, but it is likely that marriages are timed to coincide with holidays from work, and are least likely during the Church season of Lent.

The seasonality of births is far less pronounced than that of marriages. The second quarter is the most popular, the fourth quarter the least: thus the births reflect the seasonal pattern of marriages, three quarters later. This may be due to the impact of first births on the total. It would be interesting to study seasonality of births by parity, but this is impossible due to data limitations. However, the seasonal pattern of illegitimate births has been estimated for the years 1960–70 and found to be:

Quarter:	I	II	III	IV
	94·4	113·8	99·7	92·2

This is very similar to that for all births (of which illegitimate births comprise less than 3 per cent), but the pattern is less stable from year to year. An F-test for stable seasonality was applied to the data for illegitimate births and found to be significant at the ·01 level. (An F value of 15·5 was found, compared with the value of 4·3 for significance at the ·01 level with 3 and 40 degrees of freedom). Thus it seems that the seasonal pattern in births is not merely due to seasonal pattern of marriages, but may reflect a seasonal pattern in the factors influencing conception and in particular sexual activity. Seasonal patterns in births in other countries have been studied and attributed to the influence of holidays on sexual activity [11]. It is interesting that the seasonal pattern of Irish births resembles that found in Britain rather closely, but is very different from the American pattern, where there appears to be a significant negative correlation between (climatic) temperature and the conception rate [19].

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TABLE A1: *Marriages, 1958-1970, Annual, and Three-Quarter Moving Average of Seasonally Corrected Quarterly Data at Annual Rates*

Year	Annual	First quarter	Second quarter	Third quarter	Fourth quarter
			000's		
1958	15·1	14·9	15·3	15·0	14·7
1959	15·4	15·0	15·2	15·7	16·0
1960	15·5	15·9	15·7	15·0	14·5
1961	15·3	14·8	15·0	16·0	15·1
1962	15·6	15·8	15·7	15·1	15·5
1963	15·6	15·0	15·3	15·5	15·1
1964	16·1	16·2	16·0	16·9	16·8
1965	16·9	16·6	17·0	16·4	17·0
1966	16·8	16·4	16·6	16·6	16·9
1967	17·8	17·6	17·7	18·4	18·4
1968	19·0	18·6	18·8	19·0	20·2
1969	19·9	20·0	20·1	19·4	19·3
1970	20·7	20·2	20·4	21·6	21·2

Data Source: [7], [8].

TABLE A2: *Births 1958-1970. Annual, and Three-Quarter Moving Average of Quarterly Data at Annual Rates*

Year	Annual	First quarter	Second quarter	Third quarter	Fourth quarter
			000's		
1958	59·5	60·2	59·3	59·2	59·6
1959	60·2	60·3	60·3	60·1	59·8
1960	60·7	60·0	60·7	61·1	60·8
1961	59·8	60·2	60·0	59·8	60·6
1962	61·8	60·8	61·5	61·5	62·0
1963	63·2	62·6	63·1	63·4	63·2
1964	64·1	63·4	63·7	64·6	64·9
1965	63·5	64·6	63·9	62·9	62·3
1966	62·2	62·0	62·3	62·3	62·0
1967	61·3	61·8	61·2	61·4	61·6
1968	61·0	61·4	60·9	60·4	60·9
1969	62·8	61·7	62·8	63·4	63·8
1970	64·1	64·0	64·2	64·3	64·8

Data Source: [7], [8].

TABLE A3: *Births classified by the number of previous live-born children; Annual Data, 1958–1970*

Year	Number of previous live-born children					
	0	1	2	3	4	5 or more
	000's					
1958	12·3	11·2	9·4	7·6	5·6	13·4
1959	12·6	11·2	9·5	7·5	5·8	13·4
1960	12·7	11·0	9·7	7·8	5·8	13·7
1961	12·5	10·7	9·6	7·7	5·7	13·5
1962	13·3	11·1	9·9	7·8	6·0	13·7
1963	13·9	11·4	10·3	7·9	6·1	13·7
1964	14·1	12·0	10·4	8·1	5·9	13·6
1965	14·9	12·2	10·2	8·0	5·7	12·6
1966	14·8	12·1	10·0	7·6	5·6	12·1
1967	14·8	12·3	10·0	7·6	5·4	11·3
1968	15·9	12·4	9·8	7·5	5·0	10·3
1969	17·0	13·1	10·1	7·4	5·2	10·1
1970*	17·4	13·8	10·6	7·6	5·0	9·7

Data Source: [7].
*Based on data for births occurring in 1970; all other data refer to year of registration. 1970 figures have been "grossed-up" by ratio of total births registered to births occurred.

TABLE A4: *Births by age of mother and number of previous live-born children (selected series) Annual Data, 1958–1970*

Year	No previous live-born children, Age 20–24	Five or more previous live-born children		
		Age 30–34	Age 35–39	Age 40 and over
	000's			
1958	3·6	3·7	5·2	2·8
1959	3·9	3·7	5·3	2·8
1960	4·1	3·7	5·4	3·0
1961	4·2	3·6	5·3	3·1
1962	4·7	3·6	5·4	3·2
1963	5·0	3·7	5·2	3·1
1964	5·3	3·6	5·2	3·2
1965	5·7	3·5	4·8	3·0
1966	5·9	3·2	4·6	2·9
1967	6·2	3·0	4·2	2·7
1968	6·9	2·8	4·0	2·5
1969	7·4	2·7	3·8	2·4
1970*	7·8	2·7	3·8	2·2

Data Source: [7].
*See note to Table A3.

TABLE A5: *Births in England and Wales, Scotland and Northern Ireland—Centred Four Quarter Moving Totals 1961–70*

Year	England and Wales				Scotland				Northern Ireland			
	1st quarter	2nd quarter	3rd quarter	4th quarter	1st quarter	2nd quarter	3rd quarter	4th quarter	1st quarter	2nd quarter	3rd quarter	4th quarter
	000's				000's				000's			
1961	—	—	812·4	825·2	—	—	101·7	102·6	—	—	32·1	32·2
1962	830·8	836·4	841·2	843·2	103·3	103·9	104·1	103·6	32·2	32·4	32·7	32·8
1963	848·8	854·4	855·2	858·0	103·5	103·2	103·1	103·5	33·6	33·4	33·3	33·5
1964	866·0	872·0	876·0	873·6	104·0	104·2	103·6	102·5	33·9	34·2	34·7	34·6
1965	867·2	865·6	863·6	858·8	101·3	99·9	98·3	97·4	34·2	34·0	33·5	33·5
1966	855·2	851·6	848·8	849·6	96·9	97·1	97·8	97·3	33·4	33·3	33·4	33·5
1967	844·0	834·4	828·8	823·2	96·3	95·8	95·1	95·0	33·4	33·5	33·4	33·2
1968	820·8	821·6	820·0	818·0	95·0	94·3	93·3	92·1	33·2	33·0	32·8	32·8
1969	812·8	803·2	790·0	780·4	90·8	89·3	88·1	87·6	32·6	32·3	32·1	32·1
1970	778·0	782·4			87·4				32·1	—	—	—

Data Source: [17].

TABLE A.6 : *Births by region of Ireland (area of residence of mother). Centred Four Quarter Moving Totals, 1958–70*

Year	Dublin County and County Borough and Dun Laoghaire County Borough					Rest of Ireland			
	1st quarter	2nd quarter	3rd quarter	4th quarter		1st quarter	2nd quarter	3rd quarter	4th quarter
	000's						000's		
1958	16·6	16·5	16·5	16·6		43·5	43·2	43·0	43·0
1959	16·9	17·1	17·0	17·1		43·1	43·2	43·1	43·0
1960	17·2	17·3	17·3	17·3		43·3	43·4	43·5	43·4
1961	17·4	17·4	17·7	17·9		43·1	42·7	42·5	42·7
1962	18·0	18·2	18·4	18·6		42·9	43·2	43·5	43·5
1963	18·8	19·0	19·0	19·0		43·7	44·0	44·1	44·2
1964	19·3	19·5	19·8	19·7		44·3	44·4	44·6	44·9
1965	19·6	19·6	19·4	19·4		44·7	44·2	43·8	43·2
1966	19·2	19·0	19·0	18·9		43·2	43·2	43·1	43·2
1967	19·0	18·8	18·8	18·9		42·8	42·5	42·7	42·6
1968	18·7	18·8	18·8	18·9		42·4	42·2	41·9	41·9
1969	19·2	19·3	19·5	19·8		42·7	43·3	43·7	44·1
1970	19·8	19·9	20·3	—		44·2	44·1	44·2	—

Data Source: [8].

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