

Estate Duty Wealth Estimates and the Mortality Multiplier

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Abstract: Mortality multipliers are used in conjunction with estate duty data in many countries to estimate wealth distribution. Among the possible deficiencies of this approach is the fact that the estimates are dependent on the mortality multipliers which are used. This is a serious problem in the case of Irish wealth estimates, since mortality multipliers for the general population only were available, whereas multipliers for the upper socio-economic groups were used elsewhere. Accordingly, some adjusted sets of mortality data from the UK were applied to the Irish estate duty data. Very different total amounts of personal wealth emerge from the various calculations, but the distributions are not at variance with some important earlier findings. These are that, notably, there is inequality in the distribution of wealth, with the top 5 per cent of adults owning over 60 per cent of wealth, males own at least two-thirds of that wealth, and mean wealth-holding increases with age, reaching a maximum in the 55 to 64 years age group.

IN those countries where taxation is levied upon the estates of deceased persons, information about the size of estates and the age and sex of the deceased is often used to estimate the total amount of and the size distribution of personal wealth. This mortality multiplier approach has been attempted by private researchers and official organisations in, for example, the United Kingdom and the United States of America for many years, while some tentative estimates have been prepared by the present author for the Republic of Ireland in 1966, where the particular methodology used in connection with the Irish data was described at some length (Lyons, 1972b).

The mortality multiplier approach has several serious deficiencies, which are referred to by all writers on the subject, and many attempts have been made to improve original estimates. While the detailed criticisms of the method are large in number, they may all be described under one of the following headings:

1. The author is grateful for suggestions made and information supplied by Professor A. B. Atkinson and Mr A. J. Harrison of the Department of Economics, University of Essex. They bear no responsibility for the ensuing results and remarks.

- (i) the mortality multipliers used to gross up the estate duty data to estimate total wealth might not be correct. It is generally considered that the multipliers tend to underestimate the numbers of wealthy persons and their total wealth, producing errors in the size distribution of personal wealth;
- (ii) the persons who have died, whose age and sex characteristics are used to gross up the estate duty data, might not be a representative sample of the population within each age and sex group. To the extent that the deceased are unrepresentative, any estimates based on them and their estates will exhibit bias either upwards or downwards; and
- (iii) the estates left by the deceased might not be representative of wealth possessed by the entire population. This could occur, for example, if evasion of tax was successfully attempted by means of under-declaration of the value of assets in an estate, or if avoidance of tax were achieved, where allowed, by means of lifetime gifts. Unrepresentative estates would therefore produce bias in the estimates of personal wealth.

In the present exercise, the results are presented of an analysis of the first of these factors, namely, the sensitivity of wealth estimates to different mortality multipliers.² In addition to an examination of the total wealth estimates using different mortality multipliers and the ensuing size distribution of personal wealth, comparisons are made between the more important conclusions of the original study and those revealed by the revised estimates.

The Main Mortality Multipliers

Although the Irish research was produced at a much later date than similar investigations in other countries, it used even more elementary mortality multipliers than those employed elsewhere. The most important single factor affecting mortality is, of course, age, with sex probably next in importance. But in a study of wealth, it is usually assumed that mortality experience improves with increasing wealth, and social status or occupational mortality rates which are available are used as an approximation to mortality rates directly associated with wealth, which are not available. Mortality is also dependent upon marital status—the mortality of the married being more favourable than that of the single—as well as on many other factors.

In Ireland, however, the only available statistics on mortality which could be used in the analysis are those for the general population. Mortality rates classified by marital status were not used, since the estate duty data collected did not include the marital status of the deceased. Urban/rural mortality rates were not used either, due to the difficulty of classifying the deceased to these areas, and the very small samples which often occurred in specific areas. The mortality rates for the

2. An examination is in progress concerning the representative nature of the deceased persons.

general population were used in the original research referred to above as well as in the revised estimates used in this paper and published elsewhere (Lyons, 1974a). Some account was taken, however, of different general mortality rates in Dublin and Cork cities and in individual counties in a paper on wealth distribution in Irish counties (Lyons 1974b).

In their investigation of personal wealth in Britain, however, Lydall and Tipping (1961) stated that, while they started with general mortality rates, "owners of property above £2,000 are likely to have lower mortality rates than the general population", and they accordingly assumed, as did others before them, "that their mortality rates would correspond more closely to the average rates for Social Classes I and II, as defined in the Population Census". A similar approach has since been followed in official estimates of wealth distribution in the UK.

This use of mortality rates applicable to the upper socio-economic classes has much to commend it, but it has been criticised by Revell (1967) as being useless, due to the discrepancies present in the calculation of these upper class mortality rates. In particular, matching exercises demonstrated that there were major discrepancies between the occupational and social class statements obtained from the Census of Population and the death certificate, and the numbers unemployed differed substantially.

Thus Revell rejected these mortality data in favour of life insurance data derived from the Continuous Mortality Investigation based on the mortality experience of life offices in the United Kingdom. He argued that the population was known and thus there was no problem of incorrect classification, and that those holding life assurance policies were likely to be representative of wealth-holders appearing in the estate duty returns. As against these advantages, the life office data present a problem of "selection" by health, since acceptance for life assurance at standard rates of premium depends upon evidence of health, and those selected are likely to be, in some sense, healthier than those who are not selected. In addition, the Continuous Mortality Investigation does not include female lives. Other evidence indicated that, in the older age groups, the ratio of female to male mortality was similar to that in the general population, and Revell assumed that this was true for all ages.

In a more recent paper, Atkinson and Harrison (1974) employ the basic approach used by Revell, but they do not reject the occupational mortality approach, since the latest data, for 1961, "suffers somewhat less seriously from errors in occupational statements than the 1951 figure considered by Revell". The authors employed various multipliers, and made other improvements to the estimates, and discovered a certain degree of sensitivity of the results to different assumptions, which they suggested might place bounds on the degree of inequality of wealth distribution, although different mortality rates produced different wealth estimates.

Another recent paper devoted even more space and energy to the problem of different mortality rates, the country of study being the United States of America. Smith (1974) employed white race age-sex-specific mortality rates, life insurance

data and occupational mortality data, and various combinations of these, both ignoring and taking account of the influence upon mortality of marital status. Smith concluded that the wealth distribution estimates are very sensitive to the mortality rates used. His extreme mortality ratios, however, differ from each other to a much greater extent than do those employed by Atkinson and Harrison.

The Effects of Using Different Mortality Multipliers

Most authorities cited above consider that the use of social class and other multipliers produces wealth distributions which show greater concentration of personal wealth compared to those using general population multipliers. The effect of using different mortality multipliers is not straightforward, however, and has received little theoretical attention. In general, the use of higher mortality multipliers in the upper wealth categories gives those categories, not unexpectedly, a greater aggregate of wealth and a larger share of total wealth, but it also produces a larger number of persons in the top wealth category, offsetting some of the increased concentration effects. Of more importance, the position of the dividing line between using general mortality multipliers and higher multipliers has considerable importance. Table I illustrates the generally anticipated effects of increasing the mortality multiplier in the top wealth category.

TABLE I: *Effect of changing mortality multiplier*

Wealth per head (£)	Numbers	Total wealth (£)	Cumulative % share* of	
			population	wealth
Original				
50,000	10	500,000	10	62.5
10,000	10	100,000	20	75
5,000	40	200,000	60	100
0	40	0	100	100
Total	100	800,000		
Double Top Multiplier				
50,000	20	1,000,000	20	76.9
10,000	10	100,000	30	84.6
5,000	40	200,000	70	100
0	30	0	100	100
Total	100	1,300,000		

*Cumulating from the top.

In this case, when the multiplier in the top wealth category is doubled, with a compensating reduction in the lowest category to ensure that total population remains unchanged, the share of the top 20 per cent of population in total wealth increases from 75 per cent to 76.9 per cent, indicating increased concentration of wealth ownership at the top of the distribution. But simultaneously, concentration at the lower end appears to have been reduced, since total wealth is shared among 70 per cent of the population, rather than among 60 per cent as before. It is not a simple matter to evaluate the overall change in the degree of concentration. If higher mortality multipliers are used in all positive wealth-owning categories, a different picture emerges, illustrated in Table 2.

TABLE 2: *Effect of changing several mortality multipliers*

Wealth per head (£)	Numbers	Total wealth (£)	Cumulative %* share of	
			Population	wealth
Original				
100,000	10	1,000,000	10	60.6
50,000	10	500,000	20	90.9
10,000	10	100,000	30	96.7
5,000	10	50,000	40	100
0	60	0	100	100
<hr/>				
<i>Total</i>	100	1,650,000		
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Double Top Four Multipliers				
100,000	20	2,000,000	20	60.6
50,000	20	1,000,000	40	90.9
10,000	20	200,000	60	96.7
5,000	20	100,000	80	100
0	20	0	100	100
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<i>Total</i>	100	3,300,000		

*Cumulating from the top.

The amount of wealth in total and in each category has been doubled, as has the number in each wealth-owning category. Thus the doubling of the multipliers has resulted in the share of the top 20 per cent of population falling from 90.9 per cent to 60.6 per cent, and for 96.7 per cent of the total wealth to be held by the top 60 per cent rather than the top 30 per cent, and concentration has been considerably reduced. These are, of course, extreme examples, but they tend to demonstrate that *a priori* beliefs that the use of social class multipliers will necessarily lead to increased wealth concentration estimates are not fully vindicated, giving the basic justification for the empirical analysis of the Irish data which follows.

The New Mortality Multipliers Used in Ireland

As has been explained above, no occupational or social class mortality data are available in respect of the Irish population. The data given by Park (1969) in respect of Northern Ireland were not used here since they do not refer to socio-economic class, and they relate mainly to males. Recourse was taken therefore to the UK data, published by the Registrar-General (HMSO 1971), in respect of such mortality rates. In respect of life insurance data, it was ascertained from an important Life Office which was Irish owned and controlled that, largely due to the limited numbers of persons upon whom to base actuarial data in Ireland, the UK Continuous Mortality Investigation data was used in this country. It was accordingly used in the present study.³

Four different sets of assumptions were employed, leading to four estimates of the wealth distribution:

- (i) Unadjusted general population mortality rates for Ireland in 1965-66, as in the revised analysis described above, published in *The Review of Income and Wealth*;
- (ii) Unadjusted general population mortality rates for England and Wales, 1968, for comparative purposes;
- (iii) (a) Life Office data for England and Wales, 1968, for estates with a net value of £5,000 and over. These were adjusted for the differences between the general mortality ratios between Ireland and England and Wales, since the mortality rates in (ii) were generally much lower than those in (i); and
 (b) Unadjusted general population mortality rates for Ireland in 1965-66, for estates with a net value of under £5,000; and
- (iv) (a) The mean of the mortality ratios relating to Classes I and II of the population, derived from the Registrar General's estimates for 1961, for estates with a net value of £5,000 and over; and
 (b) Rates mid-way between those for Social Classes I and II and those for the population as a whole, from the Registrar General's estimates, for estates with a net value of under £5,000.

Estimates under (iv) (a) and (b) were adjusted to reflect the differences in the general mortality ratios in Ireland and England and Wales. In addition, the Registrar General's estimates for single and married women separately were combined to give a single ratio for females according to their relative size in the Irish population (it being assumed that single women included widows). Finally, since the Registrar General's data were given in respect only of age groups up to 74 years, the estimates from Life Office data under (iii) were used for the age groups 75 to 84 years, and 85 years and over.

3. Data for 1968 supplied by Atkinson and Harrison.

It would have been preferable to use only mortality rates in respect of the period 1965-66 for which Irish estate duty data and mortality rates were available. The British data were used in respect of different periods, however, either because no other data were available, in the case of the 1961 Registrar General's estimates, or because the 1968 data were more readily available, in the case of the other two sets of statistics. Mortality rates, however, are unlikely to have changed significantly in the periods specified. The original and revised sets of mortality rates are given in the Appendix below.

The Resulting Size Distributions of Personal Wealth

These four sets of mortality ratios were applied to the distribution of estates by size, classified by age and sex of deceased, for Ireland in 1965-66, obtained from the Estate Duty Branch of the Revenue Commissioners. In each case, the residual of persons between those shown as possessing wealth exceeding nil and the total adult population was assumed to possess no wealth. Thus the total Irish adult population is included in each size distribution of wealth. These calculations produced the size distributions of personal wealth given in Table 3, which gives the number of persons and total wealth in each size category of net wealth, while Table 4 gives the percentage distributions derived from Table 3.

From Table 3, it is apparent that the three new estimates produce higher numbers of persons owning wealth and very much higher estimates of total personal net wealth than those of the original analysis, since the mortality multipliers used were higher in many cases, especially in the younger male age groups. The Irish unadjusted estimates give a total wealth of £2,376 million, the England and Wales unadjusted give £2,648 million, the Life Office data give £3,024 million, while the Social Class data give £2,751 million. The highest estimate is some 27 per cent above the original estimated total. The numbers of persons owning nil wealth were estimated at 1,069,379 in the original analysis, but at between 985,329 and 1,030,657 in the new estimates.

The original analysis and the Life Office data, since they use the same multipliers in this range, show those with less than £5,000 net wealth to be 562,842 in number, with total wealth of £846 million. The England and Wales unadjusted figures give 636,577 and £963 million respectively and the Social Class data produce 595,171 and £898 million. The largest differences in numbers are in the under £1,000 class, while the main differences in wealth are in the £2,000 and up to £5,000 class.

In the classes of net wealth exceeding £5,000, the original analysis produced the lowest estimates of numbers and wealth, these being 92,029 and £1,530 million. The England and Wales unadjusted are somewhat higher at 102,344 and £1,685 million, while the highest estimates are those for the Life Office data, which are 130,751 and £2,178 million. The Social Class data estimates are in between the latter two, at 111,204 and £1,853 million. In almost all cases for net wealth classes, the three new sets of estimates, in respect of both numbers and net wealth, exceed the original Irish unadjusted estimates. The only exception is

TABLE 3: Estimates of the distribution of personal net wealth, Ireland, 1966

Amount of net wealth	(i) Irish unadjusted		(ii) England and Wales unadjusted		(iii) Life office data		(iv) Social class data		
	Persons	Wealth £ million	Persons	Wealth £ million	Persons	Wealth £ million	Persons	Wealth £ million	
Nil	1,069,379	—	985,329	—	1,030,657	—	1,017,875	—	
Exceeding £	Not Exceeding £								
—	1,000	316,577	167	356,469	188	316,577	167	332,512	175
1,000	2,000	91,214	137	102,869	154	91,214	137	98,081	147
2,000	5,000	155,051	543	177,239	620	155,051	543	164,578	576
Total small estates		562,842	846	636,577	963	562,842	846	595,171	898
Exceeding £	Not Exceeding £								
5,000	10,000	46,965	332	52,557	371	66,778	472	56,617	401
10,000	15,000	17,214	210	19,079	233	24,283	297	20,698	253
15,000	20,000	9,818	170	10,902	189	13,971	242	11,981	207
20,000	25,000	5,230	118	5,758	130	7,500	169	6,424	145
25,000	50,000	8,947	317	9,879	352	12,718	450	10,796	381
50,000	60,000	1,218	67	1,298	71	1,742	96	1,480	81
60,000	75,000	821	55	904	61	1,164	79	1,003	68
75,000	100,000	1,005	88	1,106	97	1,450	127	1,236	108
100,000	150,000	457	57	487	61	642	80	532	67
150,000	200,000	67	12	68	12	87	15	82	14
200,000	250,000	80	18	83	19	113	25	103	23
250,000	400,000	157	51	176	57	229	74	192	62
400,000	—	50	35	47	33	74	52	60	42
Total large estates		92,029	1,530	102,344	1,685	130,751	2,178	111,204	1,853
Total all estates		1,724,250	2,376	1,724,250	2,648	1,724,250	3,024	1,724,250	2,751

Note: In this and subsequent tables, the individual items may not add up to the totals shown due to rounding.

in the last category of the England and Wales unadjusted estimate, where the number and net wealth are below the original estimate, due to the existence, unusually, of a lower mortality multiplier (in the male 55 to 64 year age group).

The percentage distributions of Table 4 present the same information in a somewhat different form. The proportion of persons owning nil wealth is 62 per cent in the original analysis, but between 57.1 per cent and 59.8 per cent in the new estimates. The proportion of persons owning less than £5,000 is estimated

TABLE 4: Estimates of the percentage distribution of personal net wealth, Ireland, 1966

Amount of net wealth	(i) Irish unadjusted		(ii) England and Wales unadjusted		(iii) Life office data		(iv) Social class data		
	Persons	Wealth	Persons	Wealth	Persons	Wealth	Persons	Wealth	
Nil	62.020	—	57.145	—	59.774	—	59.033	—	
Not Exceeding	Not Exceeding								
£	£								
—	1,000	18.361	7.012	20.674	7.107	18.361	5.510	19.285	6.363
1,000	2,000	5.290	5.758	5.966	5.827	5.290	4.525	5.688	5.348
2,000	5,000	8.992	22.838	10.279	23.425	8.992	17.947	9.545	20.939
Total small estates		32.643	35.607	36.919	36.359	32.643	27.982	34.518	32.650
Not Exceeding	Not Exceeding								
£	£								
5,000	10,000	2.724	13.974	3.048	14.002	3.873	15.618	3.284	14.563
10,000	15,000	0.998	8.857	1.107	8.801	1.409	9.809	1.200	9.203
15,000	20,000	0.569	7.150	0.632	7.133	0.810	7.996	0.695	7.539
20,000	25,000	0.303	4.952	0.334	4.892	0.435	5.581	0.373	5.254
25,000	50,000	0.518	13.331	0.573	13.301	0.737	14.879	0.626	13.864
50,000	60,000	0.071	2.819	0.075	2.696	0.101	3.168	0.086	2.959
60,000	75,000	0.048	2.332	0.052	2.304	0.068	2.598	0.058	2.461
75,000	100,000	0.058	3.701	0.064	3.654	0.084	4.196	0.072	3.931
100,000	150,000	0.027	2.404	0.028	2.299	0.037	2.654	0.031	2.417
150,000	200,000	0.004	0.493	0.004	0.449	0.005	0.503	0.005	0.522
200,000	250,000	0.005	0.757	0.005	0.705	0.007	0.841	0.006	0.842
250,000	400,000	0.009	2.147	0.010	2.160	0.013	2.461	0.011	2.268
400,000	—	0.003	1.473	0.003	1.242	0.004	1.713	0.003	1.527
Total large estates		5.337	64.393	5.936	63.641	7.583	72.018	6.449	67.350
Total all estates		100.000	100.000	100.000	100.000	100.000	100.000	100.000	100.000

at 32.6 per cent owning 35.6 per cent of total wealth in the original analysis, 36 per cent owning 36.4 per cent using the England and Wales unadjusted data, with low values of 32.6 per cent and 28.0 per cent from the Life Office data, and intermediate figures of 34.5 per cent owning 32.7 per cent according to the Social Class data.

For those owning more than £5,000, the original and England and Wales unadjusted estimates are fairly close together, giving 5.3 per cent owning 64.4 per cent of the wealth in the first case, and 5.3 per cent owning 63.6 per cent in the second. The Life Office data produce the highest values at 7.6 per cent owning

72.0 per cent of wealth, and the Social Class data somewhat lower at 6.4 per cent owning 67.4 per cent of total wealth.

There is relatively little difference in the concentration of personal wealth indicated by these four distributions, even though they were based on different mortality multipliers. They all indicate considerable inequality in the distribution of personal wealth in Ireland. Examination of the Lorenz curves of the distributions shows all four Lorenz curves fairly close together, with the Irish unadjusted distribution showing the greatest concentration, and the England and Wales unadjusted the least, although the differences are not of great magnitude. The Life Office data curve shows slightly less overall concentration than the Irish unadjusted data, although it is somewhat more concentrated at points below 30 per cent of total wealth. The Social Class data curve indicates slightly less concentration, at all points, than both the Irish unadjusted and the Life Office curves, and slightly greater concentration, again at all points, than the England and Wales unadjusted curve. Thus it would appear that the effect of using these different mortality multipliers, particularly the important Life Office and Social Class multipliers, is to reduce estimated concentration, but only to a very limited extent.

Ownership of Wealth by Top Percentiles of the Population

An alternative method of analysing concentration is given by calculating the percentages of total wealth owned by the top percentiles of the population, that is the wealthiest 0.5 per cent, 1 per cent, 2.5 per cent and 5 per cent of the population. While this approach excludes the vast majority of the population, it does focus attention on the most important part of the population—the wealthiest section—and it does include a very large proportion of total wealth. The shares of total wealth owned by the stated percentiles of the population are given in Table 5. While the shares are in all cases lower for the new estimates than for the original Irish unadjusted estimates, there is a remarkable similarity between all the estimates. Again, considerable inequality in the distribution of personal wealth is indicated. The England and Wales unadjusted data give, in all cases, the lowest shares, while the Life Office and Social Class data are very close to each other and close also to the original Irish estimates. The share of the top 1 per cent

TABLE 5: *Share of personal wealth owned by top percentiles of population*

<i>Percentile of adult population</i>	<i>(i) Irish unadjusted</i>	<i>(ii) England and Wales unadjusted</i>	<i>(iii) Life office data</i>	<i>(iv) Social class data</i>
Top 0.5%	24.326%	22.747%	22.938%	23.235%
Top 1%	33.657%	31.534%	32.134%	32.228%
Top 2.5%	49.493%	46.803%	48.149%	48.091%
Top 5%	63.045%	60.289%	62.902%	62.111%

of population, for example, was originally estimated at 33·7 per cent of the total, and the other estimates vary between 31·5 per cent and 32·2 per cent. At the 5 per cent of population level the estimates are relatively closer still, from the original Irish figure of 63·0 per cent to low value of 60·3 per cent from the England and Wales unadjusted data and an almost identical 62·9 per cent value given by the Life Office data. The close agreement between the original estimates and the Life Office data is particularly striking in view of the very large difference in total wealth given by the two estimates, all of which is in the wealth classes of £5,000 and over. The percentile analysis appears to add weight to the findings of the Lorenz curve analysis, that the new multipliers indicate a lower concentration of personal wealth distribution, but that this alteration is fairly small.

The Distribution of Wealth between Males and Females

The original analysis indicated that although males and females formed almost equal parts of the adult population, males accounted for a much greater share of total wealth. The estimates for the shares owned by males and females are given in Table 6.

TABLE 6: *Distribution of personal wealth between males and females*

<i>Distribution</i>	<i>Male percentage</i>	<i>Female percentage</i>
<i>Total adult population</i>	49·662	50·338
(i) Irish unadjusted	68·959	31·041
(ii) England and Wales unadjusted	66·096	33·904
(iii) Life office data	69·072	30·928
(iv) Social class data	70·488	29·512

As may be seen, females account for fractionally over half the total adult population, but all four estimates give males a disproportionately large share of total wealth. The original Irish values gave males 69·0 per cent of total wealth, and the England and Wales unadjusted data produce a slightly more equitable result at 66·1 per cent. The others indicate a worse position for females, with the Life Office data indicating a value of 69·1 per cent for males, almost identical with the original estimate, and the Social Class data producing an even higher value of 70·5 per cent. Again, the concordance between all these estimates is striking.

Wealth Distribution by Age Groups

The original analysis of wealth distribution in Ireland produced a somewhat unusual result when the mean wealth per head of population was calculated in respect of the individual age groups. Lydall and Tipping (1961) found, for

example, that average wealth increased with age, and the present author found the same pattern, with some discrepancies, in a study of wealth in Northern Ireland (Lyons, 1972a). But average net wealth was found to increase with age in Ireland, up to a maximum in the 55 to 64 year age group, and to be lower thereafter (1972b). Mendershausen (1956) stated that this latter pattern might be expected, and indeed demonstrated its existence for the most advanced age groups in the United States. In more recent studies in the United States, Projector and Weiss (1966) have discovered that both mean and median wealth reach a peak in the 55 to 64 year age group. The mean wealth per head in each age group for the four distributions is given in Table 7.

TABLE 7: Mean wealth by age groups

<i>Age group</i>	<i>(i) Irish unadjusted</i>	<i>(ii) England and Wales unadjusted</i>	<i>(iii) Life office data</i>	<i>(iv) Social class data</i>
	£	£	£	£
20 to 24 years	286	326	286	292
25 to 34 years	1,219	1,544	1,413	1,291
35 to 44 years	1,232	1,492	1,636	1,569
45 to 54 years	1,414	1,523	1,795	1,734
55 to 64 years	1,977	2,051	2,687	2,291
65 to 74 years	1,761	1,832	2,244	1,809
75 to 84 years	1,765	1,889	2,166	2,166
85 years and over	1,654	1,779	1,879	1,879
<i>Total adult population</i>	1,378	1,536	1,754	1,595

All four estimates show mean wealth per head rising with age, with some variations, from around £300 in the 20 to 24 year age group, to a maximum between £1,977 and £2,687 in the 55 to 64 year age group. Somewhat oddly, mean wealth in the 25 to 34 year age group is greater than in the two following groups in the case of the England and Wales unadjusted estimates, and this must be regarded with suspicion. After a fall in all cases in the 65 to 74 year age group, both sets of unadjusted data and the Social Class data show a slight increase in the next age group, with a fall in the 85 years and over category, while the Life Office data show a steady fall throughout. (The figures for Social Class data in the last two age groups were taken from those for Life Office data, as explained above.) Apart from the differences in the absolute values of the mean wealth figures, the similarity in their pattern is of interest. They tend to support the original conclusion that the peaking of mean wealth in the 55 to 64 year age group indicates the importance of inheritance in the acquisition of wealth, since this age group would probably have already inherited wealth from the preceding generation, but not yet transmitted it to their descendants.

Summary and Conclusions

Different assumptions about mortality multipliers have been applied to Irish estate duty data to provide several estimates of the distribution of personal wealth in Ireland. None of them can be shown to be the "correct" sets of mortality multipliers and thus be shown to provide an accurate estimate of the distribution of wealth. In addition none of them provide confirmation for the original estimates, particularly since the estimates of total personal capital differ quite considerably, both from each other and from that originally estimated. What emerges conclusively, however, is that the total amount of personal wealth, and to some extent its distribution, is highly sensitive to whatever set of mortality multipliers is used. An appropriate set of Irish multipliers remains to be produced.

No attempt has been made to investigate whether the differences observed in the distributions are statistically significant. Undoubtedly, the original estimates are subject to sampling error, but this was not evaluated since the sample from which the estimates were derived was not a random sample, rather was it expected to be merely representative. For this reason, at no time have sampling errors been calculated for the wealth distribution based on estate duty statistics in Ireland or elsewhere. In addition, it can be argued that absolute values of total wealth are of relatively little importance, but that certain features of the distribution of wealth have considerable relevance in Ireland. It is of interest, therefore, to note that several of the tentative conclusions concerning personal wealth in Ireland which appeared to emerge from the original analysis are repeated in the three alternative distributions presented above. This by no means proves conclusively that the original findings were correct, but, at the very least, provides no grounds for suspecting their validity (on the assumption that both the deceased and their estates are representative of wealth-holders and their wealth, as outlined at the beginning). These findings are as follows:—

- (i) There appears to be considerable inequality in the distribution of personal wealth in Ireland. Although the three new estimates show a slightly reduced degree of concentration compared with the original analysis, inequality is still pronounced. The top 5 per cent of wealth holders, for example, are estimated to own between 60.3 per cent and 63.0 per cent of total personal wealth;
- (ii) While there are slightly more females than males in the adult population, males own the vast majority of wealth, the estimates varying from 66.1 per cent of the total to 70.5 per cent;
- (iii) Mean wealth per head of population rises regularly with age, but reaches a peak in the 55 to 64 years age group, declining thereafter. This would appear to indicate that inheritance is an important factor causing the inequality of wealth distribution in Ireland.

APPENDIX

*The mortality multipliers**(i) and (ii) General mortality multipliers*

<i>Age group</i>	<i>(i) Ireland—unadjusted</i>		<i>(ii) England and Wales unadjusted</i>	
	<i>Males</i>	<i>Females</i>	<i>Males</i>	<i>Females</i>
20-24 years	971·54	2,156·26	1,102·18	2,581·16
25-34 years	843·08	1,196·26	1,050·33	1,565·19
35-44 years	354·16	503·80	429·76	605·93
45-54 years	137·50	189·70	142·72	233·51
55-64 years	49·60	80·86	47·32	96·52
65-74 years	19·68	29·62	18·62	35·51
75-84 years	8·38	10·42	8·11	12·47
85 years and over	3·46	4·32	3·74	4·67

(iii) Life office mortality multiples

<i>Age group</i>	<i>Life office data unadjusted</i>		<i>(iii) (a) Life office data adjusted*</i>	
	<i>Males</i>	<i>Females</i>	<i>Males</i>	<i>Females</i>
20-24 years	1,116·70	2,615·15	984·38	2,184·70
25-34 years	1,440·78	2,147·04	1,156·52	1,640·98
35-44 years	629·22	887·16	518·54	737·58
45-54 years	204·76	335·02	197·26	272·18
55-64 years	70·84	144·49	74·26	121·06
65-74 years	25·93	49·46	27·42	41·24
75-84 years	10·48	16·11	10·82	13·46
85 years and over	4·43	5·53	4·10	5·12

*For estates exceeding £5,000.

(iv) Social class mortality multipliers

Age group	All Classes	Unadjusted multipliers		Adjusted multipliers	
		Class I	Class II	Estates over	Estates under
				£5,000	£5,000
<i>Males</i>					
20-24 years	972.33	1,489.49	1,023.03	1,107.40	982.26
25-34 years	894.15	1,223.20	1,235.05	986.62	852.18
35-44 years	414.76	603.35	565.48	481.62	411.72
45-54 years	141.40	186.93	183.43	178.40	157.32
55-64 years	46.06	58.85	54.93	59.64	53.96
65-74 years	18.34	21.43	19.61	21.68	20.54
75-84 years	—	—	—	*	*
85 years and over	—	—	—	*	*
<i>Married women</i>			<i>All females</i>		
20-24 years	2,621.94	3,297.83	4,111.65	2,246.70	2,114.80
25-34 years	1,528.56	1,849.26	2,009.20	1,314.14	1,150.12
35-44 years	635.01	842.21	805.04	620.40	547.28
45-54 years	253.08	326.06	306.90	232.50	210.18
55-64 years	102.06	134.44	120.41	93.92	86.32
65-74 years	37.22	49.90	40.04	27.44	27.70
75-84 years	—	—	—	*	*
85 years and over	—	—	—	*	*
<i>Single women</i>					
20-24 years	2,289.91	2,253.13	2,441.46		
25-34 years	769.36	1,154.55	1,367.41		
35-44 years	350.02	425.36	539.79		
45-54 years	177.87	206.45	217.58		
55-64 years	83.94	101.12	85.00		
65-74 years	31.46	30.65	21.88		
75-84 years	—	—	—		
85 years and over	—	—	—		

*Life office multipliers used.

REFERENCES

- ATKINSON, A. B. and A. J., HARRISON, 1974.
 "Wealth Distribution and Investment Income in Britain", *The Review of Income and Wealth*, Series 20, No. 2.
- H.M.S.O., 1971.
Registrar-General's Decennial Supplement, England and Wales, 1961, Occupational Mortality Tables. London.
- LYDALL, H. F. and D. G. TIPPING, 1961.
 "The Distribution of Personal Wealth in Britain", *Bulletin of the Oxford University Institute of Statistics*, Vol. 23, No. 1.
- LYONS, P. M., 1972a.
 "The Distribution of Personal Wealth in Northern Ireland", *Economic and Social Review*, Vol. 3, No. 2.
- LYONS, P. M., 1972b.
 "The Distribution of Personal Wealth in Ireland" in: A. A. TAIT and J. A. BRISTOW eds., *Ireland, Some Problems of a Developing Economy*. Dublin: Gill and Macmillan.
- LYONS, P. M., 1974a.
 "The Size Distribution of Personal Wealth in the Republic of Ireland", *The Review of Income and Wealth*, Series 20, No. 2.
- LYONS, P. M., 1974b.
 "The Distribution of Personal Wealth by County in Ireland, 1966", *Journal of the Statistical and Social Inquiry Society of Ireland*, Vol. XXII, Part V. 1972-73.
- MENDERSHAUSEN, H., 1956.
 "The Pattern of Estate Tax Wealth", in: R. W. GOLDSMITH ed., *A Study of Saving in the United States*, Vol. III, Princeton: Princeton University Press.
- PART, A. T., 1969.
 "Occupational Mortality in Northern Ireland (1960-62)", *Journal of the Statistical and Social Inquiry Society of Ireland*, Vol. XXI, Part IV, 1965-66.
- PROJECTOR, D. S. and G. S. WEISS, 1966.
Survey of Financial Characteristics of Consumers. Washington: Board of Governors of the Federal Reserve System.
- REVELL, J., 1967.
The Wealth of the Nation. London: Cambridge University Press.
- SMITH, J. D., 1974.
 "The Concentration of Personal Wealth in America, 1969", *The Review of Income and Wealth*, Series 20, No. 2, June.