WEALTH DISTRIBUTION AND INVESTMENT INCOME IN BRITAIN*

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This paper examines two different approaches to the estimation of the size distribution of wealth. The first section describes new estimates for the distribution in Britain in 1968 using the estate method and discusses the sensitivity of the results to the main assumptions. The second section presents preliminary estimates using the investment data, a method which has not been widely used. In the final section the results obtained for the upper tail of the distribution from the two methods are compared.

1. INTRODUCTION

There are three main methods by which information can be derived about the distribution of personal wealth:

(*a*) *Sample Survey Approach.*

An annual survey providing accurate estimates of wealth-holding for a representative sample of families or individuals would be an ideal source for the study of the personal distribution. Unfortunately, there have been very few such surveys in Britain. Perhaps the best known are the national savings surveys carried out by the Oxford Institute of Statistics in the early 1950's, which are described in [11] and [12]. These surveys did not, however, secure anything approaching 100 percent response and there were good grounds for believing that the wealthy were under-represented. Moreover, there appears to have been significant understatement of wealth by those taking part. As it is described by Lydall and Tipping ([6], p. 85):

> "The 1954 savings survey achieved a response rate of only 67 percent amongst the 'income units' approached for interviews and there was almost certainly a substantial amount of understatement of assets even by those who were 'successfully' interviewed."

Unless the response can be improved, the experience with the Oxford savings surveys suggests that they are unlikely to provide by themselves an adequate source of estimates of the distribution of wealth;[1] moreover, no survey comparable with the Oxford data has been undertaken since the mid-1950's. In view of this, we have to rely on two indirect methods of obtaining information about the distribution.

* This paper describes research being undertaken at the University of Essex supported by the Social Science Research Council. The full results of the study will be reported in a forthcoming monograph [21], which contains further details of the methods employed. We are grateful to participants in the Balatonfüred Conference of the I.A.R.I.W. and to A. Klevorick and J. Whalley for comments on an earlier version of the paper.

[1] At the same time, it may be reasonable to suppose that they give a more accurate indication of wealth-holding at the lower end of the distribution; and Lydall and Tipping used the Oxford data for 1954 to estimate the distribution among persons with wealth of less than £2,000.

(*b*) *Estate Duty Approach*

Under the present system of taxation in Britain, the only occasion when a person has to reveal his total assets and liabilities is when he dies. The returns of wealth made for the purpose of the estate duty are, therefore, an important source of information about the distribution of wealth: in effect they allow the dead to be used as a sample of the living. The basic method of estimating the distribution of wealth from this source is well known. If it is assumed that those of a particular age and sex dying in that year are representative of the living population, the overall distribution may be obtained by "blowing up" the estate data by a mortality multiplier equal to the reciprocal of the mortality rate. The first application of the estate-multiplier technique to the size distribution of wealth in Britain was that by Sir Henry Clay in 1925 [1]. Since that date interest in the subject has followed a cyclical pattern with major studies following at approximately ten year intervals—Daniels and Campion [2] and Campion [3] in the mid 1930's, Langley [4], [5] at the beginning of the 1950's, and Lydall and Tipping [6] in 1961.

In Section 2 of this paper, we present estimates based on the estate duty returns for 1968. These estimates differ from those published by the Inland Revenue in that they are adjusted in a number of respects to allow for the deficiencies of the estate duty data. They follow the earlier studies of Clay, Campion and others in allowing for the small wealth-holdings not covered by estate returns and for "missing" property such as that held in trusts.

(*c*) *Investment Income (Giffen) Approach*

Although the estate duty method has been that most commonly employed in Britain in the past fifty years, the quite different investment income approach was much used by early writers, and indeed in 1915 Lord Stamp stated that "the accepted method of ascertaining the national capital wealth is the capitalisation of the income tax statistics." ([13], p. 376).[2] This method was used by Baxter and Newmarch but is particularly associated with Sir Robert Giffen, who described it as follows ([14], pp. 346–7):

> "It becomes possible by means of the income tax assessments to apply a certain number of years' purchase, according to the best estimate that can be formed, to the different descriptions of income from property, and by this means an estimate of the capital yielding income can be arrived at. There is, no doubt, some difficulty in establishing what the multiplier in each case should be [but] great masses of the property are in such a form, for instance railway shares and stocks, that anyone with a knowledge of market conditions can easily apply an approximate figure by which the total income may be multiplied so as to show the capital represented at its market value."

The investment income approach has been little used in recent years but it provides a valuable check on the estimates derived from the estate duty returns. It is therefore rather surprising that no attempt has been made to see how far the estimates of the size distribution obtained from the two sources may be reconciled. In Section 3 of the paper, we present preliminary results for yield multipliers

[2]For discussion of its use in the United States, see [18] and [19].

applicable to the investment income returns in Britain in 1968 and in Section 4 examine the extent to which the results are consistent with those obtained from the estate data.

2. Estate Duty Estimates[3]

This section describes estimates of the size distribution of personal wealth in Britain for 1968 based on the estate duty returns.[4]

The first stage involves the application of multipliers to the estate data. The main multipliers used for this purpose were obtained from the Registrar-General's analysis of occupational mortality based on the census of population. We followed the practice of the Inland Revenue in adjusting for social class (which is assumed to be correlated with wealth) by using:

(i) for estates over £3,000 in 1968, multipliers relating to social classes I and II (broadly the managerial and professional classes),

(ii) for estates under £3,000, rates midway between those for social classes I and II and those for the population as a whole.

Applying these multipliers to the estate data gives the results shown in column 3 of Table 1 for the total numbers in each wealth range. Columns 4 and 5 show the same data in terms of cumulative shares of the total adult population and with their wealth expressed as a cumulative share of the total covered by the estate duty returns.[5] For purposes of comparison with the investment income data, the upper ranges are given in more detail than in the corresponding Inland Revenue estimates (where the top class is £200,000 and above), but it has to be borne in mind that in some cases these estimates are based on a small number of estates and hence may be subject to considerable sampling error.

The estimates presented in Table 1 are based on methods similar to those employed by the Inland Revenue in preparing the official statistics,[6] and these methods have been subject to a number of criticisms. The first criticism considered here is that the source of the multipliers is unreliable. Revell [10] has pointed to the errors involved in the occupational mortality rates and has argued in favour of using multipliers based on the mortality experience of life assurance offices (as used in the United States by Lampman [7]). This alternative approach leads to the results shown in Table 2. As can be seen, this has a relatively small effect on the cumulative shares of total wealth held by a given percentage of the population: in terms of the share of the top 1 percent the difference is some 1 percent of total wealth. The effect on the absolute numbers in each range is much more marked.

[3]The basic data used in this and the next section were made available by the Inland Revenue Statistics and Intelligence Division and we are very grateful to them for their assistance with the investigation. They are not responsible in any way for the use to which the data has been put.

[4]A fuller account of the methods of estimation is given in [15].

[5]For this purpose "adult" is defined as 18 and over. Any definition of the adult population is essentially arbitrary, but 18 was chosen on the grounds that it is both the age of majority and likely to correspond to the average age at which children become financially independent of their parents. The use of 18 may be compared to that of 15 by the Inland Revenue, 20 by Lydall and Tipping, and 25 by Daniels and Campion, Campion and Langley.

[6]The main respect in which they depart from the Inland Revenue estimates is that the Inland Revenue combine age groups and smooth the estate data before applying the mortality multipliers. As is argued in [15], the rationale for these adjustments is unclear.

TABLE 1

UNADJUSTED ESTATE DUTY ESTIMATES—GREAT BRITAIN 1968

1. Range of net wealth (lower limit) (£)	2. Average wealth (£)	3. Number (000's)	4. Cumulative percentage of total*	5.
			Population	Wealth
1,000	2,623	8054.8	30.230	96.6
5,000	7,193	2137.6	9.493	73.2
10,000	12,296	611.3	3.989	56.1
15,000	18,148	300.5	2.415	47.8
20,000	24,193	139.7	1.642	41.8
25,000	34,991	316.4	1.282	38.0
50,000	53,340	46.2	0.467	25.8
60,000	69,659	38.8	0.348	23.0
75,000	86,254	36.9	0.248	20.0
100,000	119,497	30 8	0.154	16.5
150,000	172,731	10.0	0.074	12.4
200,000	219,485	9.5	0.049	10.5
300,000	465,182	4.4	0.024	8.2
500,000	902,116	4.3	0.013	5.9
1,000,000	2,416,586	0.6	0.001	1.6
Total	5,256	17041.5	—	—

*In this and all following tables where cumulative percentages are used, they are cumulated from the highest wealth range downwards.

The estimated number with £$\frac{1}{2}$ million or more, for example, goes up from 4,917 to 5,572. The implications of this are discussed further in section 4.

A second major criticism of the Inland Revenue approach is that it ignores substantial amounts of wealth. These omissions are important at the extremes of the distribution. At the bottom end, over half the population are not represented in the estate duty returns, since the latter only cover estates on which duty is payable or where probate is required.[7] In 1968 the estimated number of wealth-holders according to the Inland Revenue was 17 million compared with a population aged 18 and over of 39 million. In Tables 1 and 2, these "missing" people have been assumed in effect to have on average no wealth at all, which is scarcely realistic. At the other end of the distribution, there are other important elements of "missing" wealth which arise from the provisions of the estate duty law, particularly those allowing wealth to be transferred in certain circumstances without duty being paid. Such wealth includes:

(i) property settled on a surviving spouse (who has no power to dispose of the capital) which is exempt on the death of this spouse,

(ii) property held under discretionary trusts (exempt before the 1969 Finance Act),

(iii) items treated as estates by themselves which do not appear if they do not exceed the exemption limit,

(iv) assets such as pensions and annuities which disappear on death.

[7]In 1968 the estate duty exemption limit was £5,000.

TABLE 2

ALTERNATIVE ESTATE MULTIPLIERS—GREAT BRITAIN 1968

Range of net wealth (lower limit) (£)	Census Multipliers			Life Office Multipliers		
	Number (thousands)	Cumulative percentage of total		Number (thousands)	Cumulative percentage of total	
		Population	Wealth		Population	Wealth
1,000	8054.8	30.230	96.6	7984.5	31.730	97.3
5,000	2137.6	9.493	73.2	2500.6	11.174	76.0
10,000	611.3	3.989	56.1	720.6	4.736	58.4
15,000	300.5	2.415	47.8	353.6	2.880	49.8
20,000	139.7	1.642	41.8	169.7	1.970	43.6
25,000	316.4	1.282	38.0	379.1	1.536	39.6
50,000	46.2	0.467	25.8	55.9	0.560	26.7
60,000	38.8	0.348	23.0	46.4	0.416	23.8
75,000	36.9	0.248	20.0	44.3	0.296	20.7
100,000	30.8	0.154	16.5	36.5	0.182	17.0
150,000	10.0	0.074	12.4	12.1	0.088	12.7
200,000	9.5	0.049	10.5	11.3	0.057	10.7
300,000	4.4	0.024	8.2	5.3	0.028	8.3
500,000	4.3	0.013	5.9	4.9	0.014	5.9
1,000,000	0.6	0.002	1.6	0.7	0.002	1.7

The total extent of such missing wealth has been considered by Revell in his work on national balance sheets for the early 1960's, where he estimated total personal wealth to be significantly in excess of the figure obtained from the estate duty statistics. Part of this discrepancy may be attributed to errors in the balance sheet totals; part stems from differences in methods of valuation (see [15]); but there can be little doubt that the omissions referred to above are important.

In an attempt to allow for some part of the "missing" wealth, we have made adjustments to the estate estimates. These adjustments are based on balance sheet totals, obtained by the same method as Revell, but we have gone beyond him and have attempted to allocate the missing wealth by ranges. This allocation is necessarily only approximate. In some cases the nature of the asset suggests that it is probably held in certain wealth ranges: for example, those types of property which can be transferred without probate and hence are likely to belong to wealth-holders not represented in the estate returns. However, in general, it is necessary to make a number of assumptions and the practice followed is to make four types of assumption:

B1: No Adjustment.

B2: Lower Bound to Inequality—where wealth is allocated as far as reasonable to lowest wealth groups.

B3: A Central Estimate—inevitably arbitrary but a "best guess."

B4: Upper Bound to Inequality—where wealth is allocated as far as reasonable to upper wealth groups.

(The precise assumptions are described in greater detail in [15].)[8]

The results obtained with these four assumptions in the case of the census multipliers are shown in Table 3.[9] It is immediately clear that the outcome differs considerably according to which assumption is made: for example, the share of the group below £1,000 ranges from 3.5 (no adjustment) to 9.8 percent (adjustment B2). Where the wealth is allocated as far as reasonable to the lowest wealth groups (B2), the effect of the adjustment is to shift the Lorenz curve inwards at all points below £100,000, but in the upper bound case (B4) the Lorenz curve shifts outward at all points above £5,000. In general, the results suggest the critical importance of the allocation of missing wealth by ranges and the need for further research designed to narrow the bounds placed on the allocation.

Finally, the results obtained here may be compared with the official Inland Revenue estimates. The correct method to be used for such a comparison is open to debate. The Inland Revenue choose to summarise their results in the form of Gini coefficients, but this has little apparent justification; and it seems preferable to adopt the time-honoured approach of comparing points on the Lorenz curves. In order to present the results in this form, interpolation is in general necessary and the method used is to take a log-linear interpolation of the Lorenz curves. In comparing Lorenz curves, it is conventional to take the top 1, 5, 10 percent etc., but since we are particularly concerned with the top of the distribution, it seems

[8]No adjustments are made here for differences in the method of valuation, with the exception of life policies and pension rights. An adjustment has, however, been made for Northern Ireland and overseas residents.

[9]One further difficulty which should be mentioned here is that the adjustments for missing wealth may change the ranking by size of holding. No allowance has been made for this in the estimates presented below.

TABLE 3

ADJUSTED ESTATE DUTY ESTIMATES—GREAT BRITAIN 1968

Range of wealth (lower limit) (£)*	No Adjustment		Adjustment B2		Adjustment B3		Adjustment B4	
	Average wealth (£)	Cumulative share (%)	Average wealth (£)	Cumulative share (%)	Average wealth (£)	Cumulative share (%)	Average wealth (£)	Cumulative share (%)
1,000	2,623	96.5	2,679	90.2	2,651	93.2	2,524	95.9
5,000	7,193	73.0	6,826	67.5	7,243	71.3	7,344	75.7
10,000	12,296	56.0	11,432	52.3	12,512	55.5	12,707	60.3
15,000	18,148	47.7	16,713	45.0	18,553	47.7	18,856	52.7
20,000	24,193	41.6	23,251	39.8	24,540	42.1	26,284	47.1
25,000	34,991	37.9	34,021	36.4	35,538	38.6	38,339	43.5
50,000	68,492	25.7	68,888	25.2	73,604	27.1	84,007	31.6
100,000	132,534	16.5	138,437	16.5	152,515	18.0	183,748	21.5
200,000	296,965	10.5	316,330	10.6	355,208	11.7	440,471	14.1
500,000	1,090,297	5.9	1,172,694	6.0	1,333,481	6.7	1,675,469	8.1

*The *ranges* relate to wealth before adjustment.

TABLE 4

COMPARISON OF PERCENTAGE SHARES OF TOTAL PERSONAL WEALTH—GREAT BRITAIN 1968

	Top % of Adult Population			
	½%	1%	2½%	5%
1. Inland Revenue*	24.9	33.1	47.2	59.3
2. Census of Population multipliers (no other adjustments)	26.5	34.9	48.5	60.5
3. Life Office multipliers (no other adjustments)	25.7	33.8	47.6	59.7
Census multipliers with				
4. Adjustment B2	26.0	33.6	45.8	56.3
5. Adjustment B3	28.0	35.7	48.5	59.6
6. Adjustment B4	32.4	40.5	53.5	64.5

*The estimates given in *Inland Revenue Statistics*, 1972, expressed as a percentage of total population aged 18 and over.

more helpful to focus on the top ½, 1, 2½ and 5 percent. The top 10 percent, for example, extends as far down as those worth £5,000 which is not exactly the kind of figure one has in mind when considering top wealth-holders.

Table 4 shows the Inland Revenue distribution (expressed in terms of the total population aged 18 and over) and the estimates given here, and allows us to assess the contribution made by different adjustments. Firstly, the Inland Revenue figures are compared with those obtained using the census multipliers without any corrections for sampling error. The effect of the Inland Revenue corrections will vary from year to year, but it is clear that in 1968 they served to reduce the share of top wealth-holders (comparing lines 1 and 2). Continuing with the census multipliers, the second set of adjustments are those to allow for missing wealth. With the central assumption B3, this involves the addition to total personal wealth of £7.7 billion, of which £3.5 billion is allocated to those not covered by the estate duty returns and £0.4 billion to those with recorded estates of under £10,000. As a result, the share in total wealth of those with recorded estates above £10,000—broadly the top 4 percent—is reduced, but at the same time the distribution *within* the top 4 percent becomes more unequal, so that the share of the very rich increases (see line (5)).

3. INVESTMENT INCOME METHOD

This section examines the evidence about the size distribution of wealth which can be obtained from the investment income returns. This involves first an analysis of the yield on different categories of asset and the asset composition of wealth-holdings. From this can be constructed a yield curve, giving the expected relationship between wealth and investment income, and this provides the basis for the estimates of the wealth distribution.

(i) *Calculation of Asset Yields.* The first stage is the calculation of yields for different categories of asset, where yield refers to that part of the return which would be taxable as investment income. Return in such forms as capital gains or imputed rent on owner-occupied houses is therefore not relevant. Earlier investigators made

use of a variety of sources. Barna [16], for example, in his study for 1937, took 12 categories of asset:

Asset	*Source*
British govenment securities Other government securities Shares	Averages of actual yields from issuing source
Insurance policies, household goods and trade assets	Zero return
Cash and bank deposits Money lent, etc. Other personalty	Assumed return
5 categories of real property	Based on average number of years' purchase published by Inland Revenue

(The last of the sources is no longer available in the form used by Barna.) The recent study by Stark [9] for 1954–63 relied on averages of actual yields from issuing source and, in the case of land and buildings, on data from the Inland Revenue income surveys. In estimating the yields used here for 1968–69, we have followed methods similar to those of Stark, although these have been modified in a number of respects and in particular use a finer classification of assets, with 28 categories. This is particularly important in the case of assets such as land and buildings, where the nature of the assets held varies considerably with the size of the wealth-holding. The detailed methods employed are described in [21] and the results are summarized in Table 5.

(ii) *Asset Composition of Wealth-Holdings.* The yield data are combined to form a weighted average for each wealth range, according to the proportions of total wealth in each wealth range held in the different assets. In earlier studies, the weights were obtained from the asset composition by *estate* sizes, which is the only published information available. However, as Revell [17] has pointed out, the systematic variation of portfolios with age leads to a serious distortion, with the asset proportions of old people receiving too much weight. Assets such as unquoted company securities and insurance policies tend to be under-stated, with government securities and cash being over-stated. The Inland Revenue has, however, made available for 1968 estimates of the asset composition of wealth-holdings based on the unpublished estate returns classified by age and asset structure (according to the 28 categories adopted here). These figures are obtained using the same assumptions as the estimates of the size distribution and are subject to some of the problems referred to above. (The implications of this are discussed later.) It should also be noted that the asset composition data relate to *individuals*, whereas the investment income data relate to *tax units*.

The resulting yield curve is shown in Figure 1. The crosses indicate the investment income corresponding to the mean wealth within each range, and the solid line is a smoothed yield curve. The yield ranges from 2.28 to 3.02 percent. This may

TABLE 5

YIELDS ON DIFFERENT ASSETS 1968–69

Assets	Yield (%)
National savings certificates and premium bonds (1)	0
Defence, development and savings bonds; tax reserve certificates (2)	6.2
Government securities maturing in less than 5 years (3)	6.2
Government securities maturing in 5 to 14 years (4)	6.6
Government securities maturing in 15 years or more (5)	7.8
$2\frac{1}{2}\%$ consols and undated government securities (6)	7.9
Northern Ireland and municipal securities (7, 8)	8.0
Commonwealth government securities (9)	5.9
Other foreign government securities (10)	5.6
U.K. ordinary shares (11, 13, 14, 16)	3.5
U.K. preference shares and debentures (12, 15)	7.6
Foreign and commonwealth company shares (17, 18)	3.2
Post Office and Trustee Savings Bank accounts (28)	3.8
Commercial bank deposit accounts (29)	5.4
Commercial bank current accounts (30), cash in the house (27)	0
Building society shares and deposits (21)	7.4
Unit trusts (19)	3.6
Household goods etc. (25)	0
Policies of insurance (26)	0
Trade, business and professional assets (31–37)	0
Money on mortgage, bonds, etc. (20, 22, 23, 24, 38)	5.6
Income due and interests in expectancy (39, 40).	0
Other personalty (41)	3.0
Land and other landed property (49, 50, 55–57)	4.2
Buildings, residential (51, 53)	0.1
Buildings, other (52, 54)	4.2
Liabilities	
Debts owing to residents in Great Britain and other deductions (43, 46)	8.8
Mortgages and other deductions (59, 60)	7.5

Note: The numbers in brackets refer to the Inland Revenue's classification numbers for categories of wealth as used in *Inland Revenue Statistics*, 1971, table 115.

appear low, but it has to be remembered that the only income which is relevant is that which is taxable as investment income under income tax.[10]

(iii) *Investment Income Data.* The final component is the data on investment income by ranges, which was obtained from the surtax returns for 1968–69. Income is total investment income for surtax purposes net of deductions for interest paid. The data are shown in columns 1–3 of Table 6. A lower limit of £3,000 has been used on the grounds that the data are likely to be seriously incomplete below this level. Liability to surtax at that time began at £2,000 of *assessed* income, where the latter was defined as total income minus certain personal allowances (which were unlikely to exceed £1,000). From this yield curve and the distribution of investment income, the estimated size distribution of wealth can be calculated—see columns 4–5 of Table 6, where the smoothed yield curve has been used to calculate the comparable wealth levels.

[10]Stark [9], for example, included interest on national savings certificates and Premium Bond prizes, but these are not in fact subject to tax and do not appear in the investment income statistics.

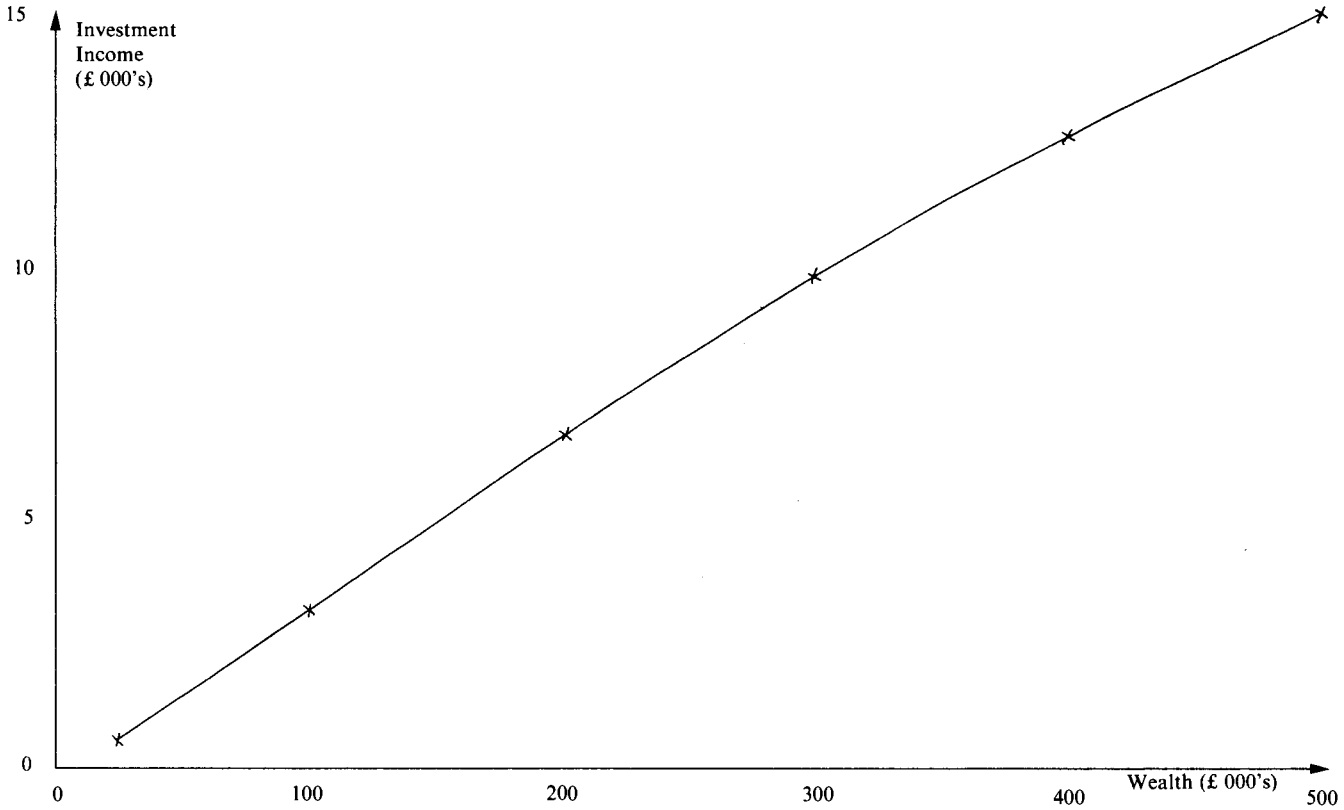

Figure 1. Yield Curve—1968

TABLE 6

INVESTMENT INCOME AND DERIVED HOLDINGS OF WEALTH—UNITED KINGDOM 1968–69

1. Investment income (lower limit of range) (£)	2. Number of income units (thousands)	3. Average Income (£)	4. Derived wealth range (lower limit)	5. Average wealth (£)
3,000	43,300	3,450	94,000	107,000
4,000	23,600	4,460	122,000	135,000
5,000	14,000	5,450	150,000	164,000
6,000	15,100	6,860	180,000	206,000
8,000	7,300	8,900	243,000	272,000
10,000	4,000	10,900	308,000	339,000
12,000	3,400	13,300	379,000	429,000
15,000	2,500	17,150	500,000	568,000
20,000	1,100	22,200	662,000	735,000
25,000	1,400	33,200	828,000	1,099,000
50,000	200	59,800	1,656,000	1,980,000
75,000	68	86,300	2,483,000	2,858,000
100,000	71	167,000	3,311,000	5,530,000
Total	116,039	6,330	—	190,000

Source: The data given in Columns 1 and 2 were supplied by the Inland Revenue, and are a more detailed version of Table 47 in *Inland Revenue Statistics 1971*. (There are some minor differences between the figures given here and those in the published table.)

Deficiencies of Investment Income Approach

In the previous section we referred to some of the shortcomings of the estate duty approach, and it is these which lend considerable importance to the comparison of the alternative estimates presented in Section 4. At the same time, it must be emphasized that the investment income approach also suffers from a number of serious deficiencies. Firstly, at a theoretical level, it is clear that where there is a distribution of returns to different assets or there are differences in tastes regarding portfolios then investment income may exhibit significantly greater inequality than the underlying distribution of wealth. The procedure followed above does not distinguish between "transitory" components of investment income and the "permanent" components corresponding to the stock variable with which we are concerned. This issue is discussed further in [21]. Secondly, there are a number of problems with the data used and some of the most important of these are discussed below:

(*i*) *Missing Wealth-Holders.* As in the case of the estate duty method, the investment income returns do not cover the whole wealth-holding population. The surtax returns by definition only relate to the upper income ranges, and the data in Table 6 cover only some 100,000 out of 20.7 million tax-paying units. The quinquennial income surveys provide comparable information covering the whole income range (most recently for 1969–70), but there are a number of ways in which the coverage is incomplete.[11] For this reason, we shall concentrate

[11]There is reason to believe that below the surtax range investment income is not necessarily reported where tax has already been paid. No adjustment was made for this in the 1969–70 survey, but in 1954–55, the Inland Revenue added a further 307,000 income units—see Stark [9], p. 12. A further source of difficulty is that arising from the deduction of interest payable—see below.

simply on the light shed by the investment income method on the upper wealth ranges.

(*ii*) *Asset Composition.* Since the asset composition data is based on the estate duty method, it is subject to deficiencies of the kind outlined in the section which discussed the estate duty estimates. Errors in the multipliers, for example, may lead to a bias in the asset composition, as may the exclusion of certain types of property. Certain of these errors may, however, be less important in the present case. This point may be illustrated with reference to the mortality multipliers. These are only used here as a means for weighting the asset composition of the estates of different age/sex groups; the overall level of the multipliers, which is the main possible source of error, is not relevant to the investment income method. To this extent, the investment income method is less subject to error.

(*iii*) *Yields.* The yield data for individual assets plays a critical role in the construction of the estimates; at the same time there are at least two major reasons why it may be unreliable. Firstly, the estimates of average yields may be incorrect. This is more likely to be the case for certain assets than others, and particular reference should be made to real property, where the methods of estimation were extremely crude. Columns 2 and 3 of Table 7 give some idea of the sensitivity of the

TABLE 7

DERIVED WEALTH RANGES UNDER DIFFERENT ASSUMPTIONS—UNITED KINGDOM 1968–69

Investment Income (£)	1. Table 6	2.	3.	4. Alternative Assumptions	5.	6.
4,000	122,000	116,000	127,000	110,000	147,000	125,000
6,000	180,000	171,000	188,000	164,000	217,000	180,000
8,000	243,000	226,000	256,000	218,000	293,000	241,000
10,000	308,000	285,000	327,000	277,000	386,000	310,000
15,000	500,000	467,000	528,000	448,000	616,000	510,000
20,000	662,000	625,000	704,000	606,000	822,000	680,000

Alternative Assumptions

cols. 2(3) Return to real property increased (reduced) by a half.

col. 4 Return to residential buildings equal to that for other landed property (4.2%).

col. 5 Return to ordinary shares reduced by 1%.

col. 6 Mortgage liabilities increased by a factor of 3, and life policies increased by a corresponding amount.

results to the return on this group of assets and show that, in fact, the estimates do not change a great deal. Halving the return on real property leads to an increase of around 5 percent in the estimated level of wealth. Secondly, the return may vary with the level of wealth, so that the average yield is not appropriate for the large holdings considered here. The direction of the bias introduced is not clear. There is likely in general to be a higher overall return to large holdings and in certain cases more of the income will be subject to tax: for example, less of the residential property owned by those in the upper wealth ranges is likely to be owner-occupied. Column 4 of Table 7 shows the effect of assuming that none of the property is owner-occupied; this reduces the estimated levels of wealth by around 10 percent at the top of the wealth scale. On the other hand, tax reasons provide a strong incentive for this group to hold assets with a low taxable return. The

wealthy are more likely to hold growth stocks or shares in private companies. Some indication of the effect which this could have on the estimates is given in column 5, where the dividend yield is assumed to be 1 percent lower than the average for the FT/Actuaries index. The estimates are highly sensitive to this yield level, and further work in this area is clearly needed.

(*iv*) *Net versus Gross Investment Income.* The only data available is that for income net of interest paid, particularly mortgage interest. This would not by itself necessarily lead to error, since the weights used for different yields were based on net worth. However, the estate data almost certainly under-states mortgage liabilities. Revell has pointed out that in 1960 the estate duty estimate of house mortgages was only some 30 percent of the total known from the issuing source ([10], p. 173), and argued that the deficiency was mainly attributable to loans secured by life policies (which were netted out when the person died). Some guide to the approximate effect of such an under-statement can be obtained by increasing the mortgage liability by a factor of 3 and adding this amount to the asset side in the form of life policies. As can be seen from column 6 of Table 7, the estimates are not greatly affected by this change—at least at the levels of investment income considered here.

There can be no doubt that the deficiencies of the investment income method outlined above are serious ones and it would be difficult to claim that the results are necessarily more reliable than those obtained from the estate returns. The one clear advantage which it does possess is that it is less subject to the errors introduced by the special provisions of the estate duty law. This applies, for example, to property settled on a surviving spouse which is exempted from estate duty but which may yield taxable income. Against this must be set the uncertainties surrounding the yield multiplier and the deficiencies of the investment income data.

4. A Comparison of the Estimates

Given that the two methods of estimation are largely independent, it is interesting to examine how far they lead to consistent results for the group of top wealth-holders.[12] For this purpose attention is focussed primarily on the unadjusted estate duty estimates given in Table 1, since these are probably more closely comparable with the results of the investment income approach.

It should be borne in mind that the estimates being compared differ in three respects. Firstly, the estate duty estimates relate to the calendar year 1968,[13] whereas the investment income returns cover the tax year 1968–69 (ending in March). With asset values rising over time, we should expect the investment income returns to predict a higher number of holdings above a specified size, although the difference may not be very great. Secondly, and more important, the estate data relates to *individuals*, whereas in the investment income estimates the wealth of husband and wife is aggregated—it relates to income units, not individuals.[14]

[12]In view of the inadequate data about the middle and lower ranges of wealth provided by the investment income method, we do not consider the *share of total wealth* owned by these people.

[13]The estate returns relate to the tax year 1968–69 but in view of the delay in estates appearing in the statistics, it is usually assumed that these relate to the preceding calendar year. This practice is followed here, although it is not entirely satisfactory.

[14]In 1968–69 the investment income of children was *not* aggregated with that of their parents.

If wives owned no assets, this would make no difference, but where wives possess wealth, the number of income units with wealth above £X would be higher than the number of individuals. According to the estimates of Revell [20] for 1954, married women owned only 6.6 percent of total personal wealth and a large part of this is likely to represent houses in joint names; however, this is still consistent with the wives of the very wealthy possessing substantial fortunes.[15] Finally the investment income data relate to the United Kingdom rather than Great Britain and this will again lead to higher estimates at each wealth level.

The upper part of Figure 2 shows the cumulative frequencies obtained from the two methods, using the estimates of Tables 1 and 6. As can be seen, the results are in accord with the expectation that the investment income method would give higher numbers at each wealth level: for example, the numbers estimated to own £100,000 or more are 60,000 (estate duty) compared with 100,000 (investment income method). It is interesting that visual inspection suggests that the shape of the distribution is closer to linearity (the Pareto Type I distribution) for the investment income estimates than for the estate estimates. The deviation of the estate estimates from linearity above £200,000 may well be explained by sampling or other error, but it would be interesting to explore this further. The lower part of Figure 2 shows the cumulated total wealth obtained from the two methods and indicates that the results are broadly similar, although the estate estimate lies above that obtained from the investment income method for the upper part of the range.

In considering these results, it is important to bear in mind their sensitivity to changes in the underlying assumptions. If we were to use life office rather than census multipliers, the estate duty estimate of the number with £100,000 or more rises to 70,000. If in the case of the investment income method we were to assume that none of the residential buildings belonging to upper wealth groups were owner-occupied, this would reduce the estimated number with £100,000 or more to 85,000, thus narrowing the gap. Figure 3 gives some idea of the effect of different assumptions on the investment income results for the cumulative frequencies.

5. Concluding Comments

This paper has reported some preliminary results from an investigation of the size distribution of wealth in Britain for the late 1960's, comparing the estimates obtained from the commonly employed estate method with the less well-known investment income method. From this comparison, the conclusions we would tentatively draw are that:

(a) the investment income method is unlikely to replace the estate duty method as the principal source of information about the overall wealth distribution, in view of the fact that the investment data have even more limited coverage than the estate data and that the results are very sensitive to the assumptions made about the yield;

[15] At a later stage of this study we hope to examine the effect of combining individual wealth-holdings from the estate data to construct a distribution by families on different assumptions about the pattern of marriage—see Lyons [22].

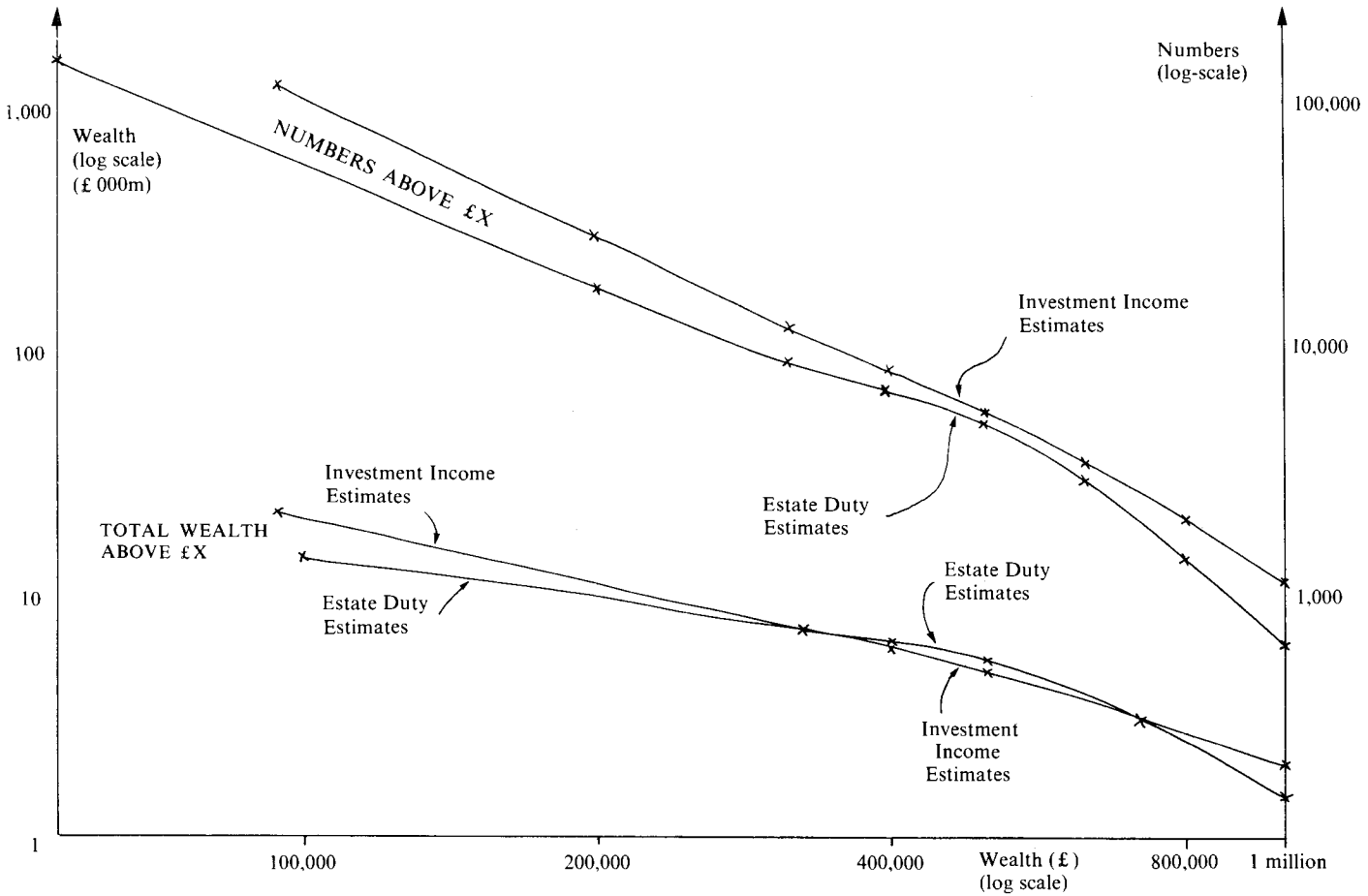

Figure 2. Comparison of Estate Duty and Investment Income Estimates

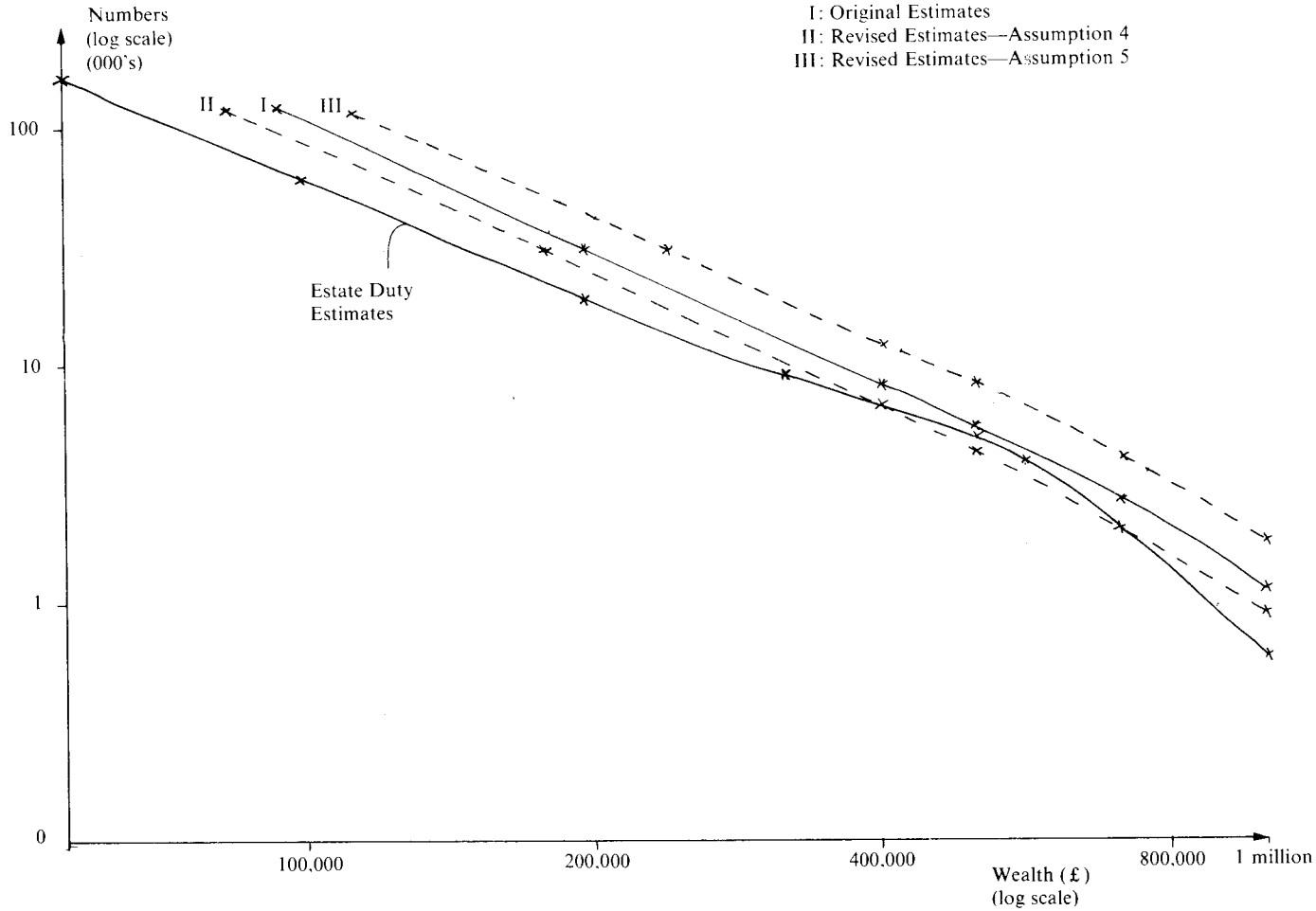

Figure 3. Investment Income Estimates using Alternative Yield Assumptions. I: Original Estimates, II: Revised Estimates—Assumption 4, III: Revised Estimates—Assumption 5.

(b) although the estimates derived from the investment income method are not fully comparable with the estate duty estimates, particularly in that the former relate to tax units rather than individuals, the results are not obviously inconsistent;

(c) a great deal of work remains to be done, both on the underlying theory and on the refinement of the estimates.

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