

1972

Capital Gains and the Distribution of Income

Kul B. Bhatia

Follow this and additional works at: <https://ir.lib.uwo.ca/economicsresrpt>

 Part of the [Economics Commons](#)

Citation of this paper:

Bhatia, Kul B.. "Capital Gains and the Distribution of Income." Department of Economics Research Reports, 7208. London, ON: Department of Economics, University of Western Ontario (1972).

20294

RESEARCH REPORT 7208
CAPITAL GAINS AND THE
DISTRIBUTION OF INCOME

by
Kul B. Bhatia

ECONOMICS LIBRARY

SEP 20 1972

CAPITAL GAINS AND THE DISTRIBUTION OF INCOME

by

Kul B. Bhatia*

I. Introduction

This paper deals with the income distribution of capital gains which have been an important source of personal income in the United States during the postwar years. A portion of realized gains is included in income for tax purposes, and some theorists will include accrued gains--not merely the realized part of them--in a comprehensive measure of income.¹ Both realized and accrued gains belonging to various income classes have been examined in several studies: Liebenberg and Fitzwilliams [6] analyzed realized gains for 1958; Neil [9] attempted to allocate unrealized gains among income groups; and long before these studies were done, Selma Goldsmith et al. [5] tried to distribute corporate retained earnings across income brackets. Most of these studies, however, either cover very few years, or include capital gains on one or two asset-types only, and use highly dubious methodology for allocating accrued gains to income categories.² Consequently, there does not emerge a clear picture of the income distribution of capital gains, and how it has changed over time.

A detailed knowledge of how capital gains are distributed across income classes will be highly useful in studies of the size distribution of income, especially in measuring changes in income inequality over time, and for

* Assistant Professor of Economics, University of Western Ontario, Canada. I am very grateful to Arnold C. Harberger for valuable comments on an earlier version of the paper, and to A. L. Nagar and John Bossons for many stimulating discussions. Thanks are also due to Irene Tapley, and Jean Johnson for programming help. The research was supported by a grant from the Canada Council.

several aspects of income taxation such as the effective progressiveness of the individual income tax, alternative schemes of taxing capital gains, and in analyzing tax induced effects on the choice of portfolio-assets by various income classes. These matters, although interrelated, cannot be dealt with by the same set of numbers. For problems of taxation, for instance, we shall use nominal capital gains and allocate them to categories of "adjusted gross income" (AGI) which forms the base for individual income tax. The income concept required for the broader question of income inequality, however, is total money income (TMI),³ and the relevant income unit is the family rather than individuals and couples who file income tax returns. Because our data did not permit dealing with all these alternatives, and also to limit the length of the paper, we shall focus here on the taxation aspects of the problem, and distribute accrued capital gains across AGI classes. The effects of capital gains on the size distribution of income and measures of income inequality will be dealt with in a separate paper.

Our analysis begins with the estimates of aggregate accrued gains on individuals' holdings of corporate stock, nonfarm real estate and farm assets derived by Bhatia [1];⁴ the goal is to allocate them to various income categories for several years. We share with some of the earlier studies the general premise that accrued gains are distributed according to wealth holdings, but, unlike them, we do not rely solely on wealth estimates for a given year. Instead, we derive regression equations to explain various components of wealth by variables such as dividends, property income, etc., which are commonly reported in the Statistics of Income (SOI) [13], and use these equations to estimate the value of assets held by each income bracket in several years.

The plan of the paper is as follows: Section II deals with alternative ways of allocating accrued gains, Section III presents empirical estimates of the regression equations and income distribution for 1962, results for other years are reported in Section IV, the economic implications of these results are discussed in Section V, and the paper concludes with an appraisal of the methodology and data used in this study. For brevity, the term "gains" is used to denote both capital gains and losses.

II. Alternative Approaches

Aggregate accrued capital gains have been estimated in [1] for four asset categories: corporate stock, nonfarm real estate, farm real estate, and livestock separately. If we had data on the holdings of these asset-classes by income bracket, we would use them to allocate accrued gains. But we have virtually no direct information on the size and composition of wealth owned by various income groups for any length of time; therefore, either some indirect estimate of income distribution of wealth has to be made, or one or more of the following methods have to be used:

1. Allocate according to realized gains, on the assumption that higher the realized gains, higher will also be accrued gains;
2. allocate according to total income because ownership of wealth will depend on income; and
3. allocate according to property income, i.e., distribute stock market gains on the basis of dividends, real estate gains according to rent etc., because property income will be a better proxy for wealth than total income.

Although there are plenty of data on realized gains, total income and property income in the Statistics of Income for various years, all three methods are highly deficient and provide, at best, crude approximations to

wealth holdings and accrued gains. The decision to realize accrued gains will depend on expected price of an asset, income from other sources, the marginal rate of income tax, the amount of losses carried over from earlier years, and a number of other considerations. Furthermore, gains realized in a given year could have accrued over several past years; and therefore, there is no well defined relationship between realized and accrued gains, at least from year to year.

Allocation of accrued gains by income implies that if income bracket A has twice as much income as B, it will get twice as much accrued gains. This will be correct only if A has twice as much wealth as B, but it is highly unlikely that such a simple and exact relationship between wealth and income will hold in the real world. This criticism also applies to the third method, i.e., allocation on the basis of property income. If A has twice as much dividend income as B in a given year, this does not imply that the value of A's stockholding is double that of B. Given the substantially lower tax on accrued gains, it is likely that upper income groups might so order their portfolio as to minimize their tax liability; allocation on the basis of dividends, thus, will underestimate their accrued gains.

It seems far preferable, therefore, to try to estimate the income distribution of various types of assets and use it for allocating accrued gains, even if only sporadic survey data on this topic are available for just a few years.

Income Distribution of Wealth

One source of data on the asset holdings of various income groups is the Survey of Consumer Finances (SCF) [12], which Neil [9] used. But these surveys, although conducted every year, do not cover the upper income groups adequately. The highest income category in SCF in many years is an open-ended

class starting at \$15,000 (the highest income bracket in the Statistics of Income is \$1 million or more), and the number of respondents in this class is rather small. The Survey of Financial Characteristics of Consumers (SFCC) [11], on which McElroy based his study [7], tried to overcome these deficiencies by sampling the relatively wealthy consumer units at higher rates, and using survey techniques designed to maximize accuracy of response. The result is a useful set of data on the income distribution of various types of assets, albeit for only one year, 1962.⁵ The published results from the SFCC, however, are by money income classes (as contrasted from AGI classes required for this study), and the definitions of asset categories are slightly different from those used for estimating aggregate accrued gains in [1]. Fortunately, owing to the fact that we had access to the original SFCC data tape, we could surmount most of these difficulties: the asset categories could be regrouped, and individual components of income adjusted to closely match the requisite definitions of asset categories and adjusted gross income.⁶

The method for allocating accrued gain can now be formally stated.

Let

- V_i = the value of an asset held by the i^{th} income bracket at the end of 1962 (the SFCC estimate)
- D_i = the dividend income of i^{th} income bracket in 1962
- P_i = the income from property (i.e., rent, interest, dividends, etc.) of i^{th} income category in 1962
- W_{it} = the estimated value of an asset held by the i^{th} income bracket at the end of year t , and
- G_{it} = accrued gains of i^{th} income bracket in year t .

Also, let superscripts c , r , and f represent corporate stock, nonfarm real

estate, and farm assets respectively. Thus, V_i^c would be the value of corporate stock owned by i th income bracket in 1962, G_{it}^f , the gain accruing on farm assets to i th income bracket in year t , etc. Furthermore, let

$$V = \sum_i V_i$$

$$W_t = \sum_i W_{it}$$

and $G_t = \sum_i G_{it}$

We shall first regress V_i on D_i and P_i using the data on the SFCC tape for 1962, and compute W_{it} for various years from these equations. Gains accruing on a particular asset will then be allocated to various income brackets according to W_i . For example, the gain accruing to the second income bracket on corporate stock in 1963 will be:

$$G_{2,63}^c = \frac{W_{2,63}^c}{W_{63}^c} \cdot G_{63}^c,$$

and, in general,

$$G_{it}^x = \frac{W_{it}^x}{W_t^x} \cdot G_t^x.$$

An Alternative Method for Allocating Gains on Corporate Stock (The Yield Method)

Friend and deCani, working with a sample of 1,600 stockholdings derived from income tax returns for 1960 noted that contrary to the belief in financial circles, the various AGI groups seemed to have done equally well on the stock market: performance relatives of the stock portfolios owned by various income classes for the years 1957-60, and 1960-63 did not differ significantly. Performance relatives were calculated by relating accrued gains and dividends to the initial market values of shareholdings. Since we have data on dividend receipts by income bracket, we can use the Friend and deCani result to estimate the income distribution of accrued gains.

Let R_i = the total return on the stock holdings of the i^{th} income class. Then $R_i = D_i$ (dividends) + G_i^C (accrued stock market gains). The Friend and deCani result can be interpreted to mean that

$$\frac{R_i}{V_i} = \frac{R_j}{V_j} = k$$

i.e., the yield on stock holdings is constant across income brackets. We have data on all stock outstanding, total dividend receipts, and accrued gains from which k can be estimated.

$$k = \frac{\sum_i R_i}{\sum_i V_i^C} \approx \frac{\sum_i R_i}{\sum_i W_i^C}$$

where W_i^C , as defined above, is an estimate of V_i^C based on the regression equations.

$$\text{Now } \frac{R_i}{W_i^C} = \frac{D_i + G_i^C}{W_i^C} = k$$

$$\therefore \hat{G}_i^C = \left(k - \frac{D_i}{W_i^C}\right) \cdot W_i^C$$

where \hat{G}_i^C is an estimate of G_i^C .

The yield method, however, is not entirely independent of the regression method discussed earlier. Apart from the use of W_i^C , which is estimated from regression equations, it can be easily proved that the two methods will yield identical results as long as each income group receives the same fraction of total dividends as the proportion of total stock owned by it.⁷ The regression method will allocate larger gains than the yield method to income brackets whose share of dividends exceeds their share of corporate stock outstanding.

The yield method, at best, however, can provide only a rough check on the results of the regression method, because Friend and deCani's findings related to stock performances over a period of 3 years, not annually as assumed above, and there were several problems of sampling and lack of information about prices of certain stocks.⁸

III. Empirical Estimation

Before estimating the regression equations, we have to rearrange the SFCC data to compute AGI and the value of assets owned by various income groups.

Rearranging Data

We adjusted income reported on the SFCC tape so as to exclude the income of family members other than husband and wife, include net short-term and one half of net long term realized gains, and deduct the standard dividend deduction allowable under the income tax law. These adjustments bring the SFCC data on money income (TMI) into a reasonably close accord with AGI. The effects of switching from TMI to AGI can be clearly seen in Table 1 where two sets of data--one based on TMI (columns 2, 4, and 6), and the other classified by AGI--are presented. The distribution of respondents, when grouped by AGI, has a larger spread than when TMI is used as the basis of classification: the numbers in the lowest and highest brackets in col. 3 (based on AGI) are larger than in col. 2 (based on TMI) of Table 1. This suggests that deductions from TMI, i.e., a portion of dividends and income of 'other family members', have been larger than the additions, i.e., realized gains, for all but the highest TMI class. The mean incomes reported in columns 6 and 7 of Table 1 reinforce this conclusion: mean incomes in col. 7 (based on AGI) are smaller than those in col. 6 (based on TMI) up to an income of \$25,000, but larger thereafter.⁹

TABLE 1. THE EFFECT OF USING ADJUSTED GROSS INCOME (AGI)
INSTEAD OF TOTAL MONEY INCOME (TMI)^a

TMI or AGI ^b (000)	Number in Sample		Number in Survey Population (million)		Mean Income (\$000)	
	(2)	(3)	(4)	(5)	(6)	(7)
Under - 5,000	757	831	27.7	29.81	2.56	2.39
5 - 10	745	738	21.2	20.30	7.24	7.16
10 - 25	591	513	8.2	6.93	13.37	13.19
25 - 50	196	179	0.5	0.51	34.53	35.38
50 - 100	173	167	0.2	0.14	61.21	62.82
100 - 200	} 95	74	} 0.1	0.04	} 158.17	} 5.34 billion
200 and above		55		0.19		
Total	2,557	2,557	57.9	57.92		

^aTotal money income is the classifying variable used in [11]. Numbers in columns 2, 4, and 6 are from various tables in [11], and use TMI as the classifying variable. Columns 3, 5 and 7, based on AGI classification; are computed from the SFCC tape.

^bAdjusted Gross Income, as defined for income-tax purposes.

To regroup the assets, we combined publicly traded common and preferred stock, shares in mutual funds and investment clubs, and shares in closely held corporations to derive corporate stock; residences owned by the family and real estate held for investment purposes were included in nonfarm real estate; and farm assets were defined as the value of family's share in farm businesses of all types.¹⁰ The aggregate and mean values of corporate stock, nonfarm real estate, and farm assets owned by various income brackets in 1962 are presented in Table 2.

Estimating Regression Equations

The main purpose of the regression equations derived here is to predict the values of assets held by various income groups for several years from variables which are summarized in the Statistics of Income (SOI) from individual income tax returns. A priori reasoning tells us that age of a person, his occupation, his income and its composition, etc., will all be important determinants of wealth, and therefore regression equations should be estimated for specific age and occupation groups. Although this can be done for 1962 with the SFCC data, such equations will have very limited use for prediction, which is our main interest, because similar data are not available in the SOI--our main source of data for other years. For this reason, our choice of independent variables is severely restricted, mainly to various components of income, and we select equations with the best predictive ability.

We experimented with several functional forms, mostly of the linear and log-linear variety, from micro data for the various income brackets from the SFCC tape. Some equations were estimated from pooled data also, applying Weighted Least Squares, to adjust for possible heteroscedasticity which often arises when cross-section survey data are used. The equations finally

TABLE 2. VALUE OF CORPORATE STOCK, NONFARM REAL ESTATE
AND FARM ASSETS OWNED BY VARIOUS
INCOME BRACKETS, 1962 [SFCC DATA]^a

AGI ^b (000)	Corporate Stock		Nonfarm Real Estate		Farm Assets	
	Total (\$billion)	Mean (\$000)	Total (\$billion)	Mean (\$000)	Total (\$billion)	Mean ("000)
0 - 5	37.22	1.25	147.92	4.96	49.71	1.67
5 - 10	42.78	2.11	227.34	11.20	27.40	1.35
10 - 25	65.14	9.40	149.52	21.57	11.97	1.73
25 - 50	73.61	144.48	42.96	84.32	5.26	10.33
50 - 100	53.21	378.14	10.27	72.96	13.57	96.42
100 - 200	40.71	1,050.08	4.67	120.34	0.45	11.58
200 and above	21.86	112.93	6.67	34.44	1.52	7.85
Total	334.53		589.35		109.88	

^aAll data computed from the SFCC tape.

^bAdjusted Gross Income. See text for definition.

selected are reported in Table 3, and are generally of the following form:

$$V_{ij}^x = \alpha' + \beta Y_{ij} \quad (1)$$

where V_{ij}^x is the value in 1962 of asset x held by individual j in income category i , and Y_{ij} , similarly, is some income variable (e.g., dividends, property income, etc.) for the same individual.

Aggregating equation (1) over j we get:

$$\sum_j V_i^x = N_i \alpha' + \beta \sum_j Y_{ij}, \quad (2)$$

where N_i is the number of records in the i th income bracket in the SFCC sample.

We can rewrite (2) as follows:

$$V_i^x = \alpha + \beta Y_i$$

where $V_i^x = \sum_j V_{ij}^x$, $Y_i = \sum_j Y_{ij}$, and $\alpha = N_i \alpha'$. The SOI data on Y_i for 1962 were then used to derive an estimate of V_i^x (\hat{V}_i^x), and the final equations were selected by comparing V_i^x and \hat{V}_i^x .

By the usual statistical tests of significance and goodness of fit, the equations for corporate stock and nonfarm real estate appear to be quite satisfactory especially when the restrictions, mentioned above, on the choice of independent variables, are taken into account. Equations for farm assets, however, whether estimated for individual income classes or from pooled data, turn out to be very unsatisfactory: the R^2 's are extremely low and the standard errors of estimate large in all cases. Also the coefficient for income is highly unstable and often insignificant. This is not surprising because the SFCC sample has very few respondents with farm assets--only 181 out of the total of 2557--and in some income classes, their number does not reach even two digits. Instead of relying on regression equations, therefore, we assume that the farm capital gains are always distributed across income brackets in the same way as

TABLE 3. REGRESSION EQUATIONS ESTIMATED FROM SFCC DATA, 1962.^a

AGI (\$ 000)	Corporate Stock				Nonfarm Real Estate			
	Constant (α')	Dividends (β)	Method of Estimation ^c	R ²	Constant (α')	Property Income ^b (β)	Method of Estimation	R ²
0-5	781.6 (1.81)	28.73 (9.86)	OLS	0.11	8,480 (17.02)	13.51 (14.48)	OLS	0.36
5-10	1,094 (1.91)	29.68 (31.18)	OLS	0.57	16,040 (24.46)	5.77 (9.30)	OLS	0.14
10-25	9,424 (2.87)	30.36 (21.85)	OLS	0.48	23,440 (14.75)	4.51 (10.56)	OLS	0.18
25-50	-8,519 (-0.16)	47.43 (71.72)	WLS	0.67	90,980 (11.41)	2.03 (23.27)	WLS	0.17
50-100	308,300 (4.92)	22.40 (6.63)	OLS	0.21	90,980 (11.41)	2.03 (23.27)	WLS	0.17
100-200	809,000 (3.25)	21.13 (4.42)	OLS	0.21	90,980 (11.41)	2.03 (23.27)	WLS	0.17
200 and more	-8,533 (-0.02)	47.43 (10.33)	OLS	0.67	90,990 (1.64)	2.03 (3.35)	OLS	0.17

^aAll the equations were estimated from micro data on the SFCC tape.

^bProperty income includes dividends, interest from various sources, and net rental income.

^cOLS represents Ordinary Least Squares, and WLS stands for Weighted Least Squares. In applying WLS, it was assumed that the variance of the disturbance term was proportional to mean income in each AGI class. WLS equations were estimated from data pooled for all income classes.

farm assets in the SFCC data for 1962. This assumption, although strong, will not much affect the overall income distribution of accrued gains because between 1947 and 1964, the years for which aggregate accrued gains were computed in [1], gains on farm assets amounted to only about 12 per cent of all accrued gains, about 20 per cent of the gains on corporate stock, and less than 50 per cent of the gains accruing on nonfarm real estate.

Estimates of gains accruing to various income brackets on the three asset categories in 1962, derived from these regression equations, are compared with the results of using SFCC wealth estimates directly in Table 4. There appears to be a reasonable correspondence between the allocations based on the two methods in most cases. For corporate stock, the regression method slightly understates the share of individuals with income below \$10,000, and also of those with income above \$100,000. The resulting error for the lower income class, however, is at least partially offset because its share of the gains accruing on nonfarm real estate is somewhat overstated. The results for the three asset categories taken together are presented in Table 5. Here it should be noted that had there been either accrued gains or losses on all the assets in 1962, the mutually offsetting errors described above would have brought about a closer correspondence than that indicated in Table 5, between the results of the SFCC and the regression methods. But 1962 was an unusual year in which corporate stock and nonfarm real estate recorded losses whereas gains accrued on farm assets. In most other years, the three asset-prices move together; the results in these years, therefore, are likely to be better than those for 1962.

We have also presented the allocations based on the yield method for corporate stock, described earlier in Section II, in columns 5 and 6 of Table 4. Given the limitations of this approach, the results are reasonably close to those of the regression method.¹¹

TABLE 4. COMPARISON OF INCOME DISTRIBUTION OF CAPITAL GAINS FOR 1962 USING ALTERNATIVE METHODS: SFCC DATA, AND REGRESSION EQUATIONS^a

AGI (000)	CORPORATE STOCK						NONFARM REAL ESTATE						FARM ASSETS	
	SFCC		Tax Data		Yield Method		SFCC		Tax Data		SFCC		SFCC	
	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%	Amount	%
0 - 5	(1) -5.89	(2) 11.13	(3) -4.94	(4) 9.33	(5) -5.93	(6) 11.19	(7) -1.80	(8) 25.11	(9) -1.96	(10) 27.47	(11) 3.00	(12) 45.24		
5 - 10	-6.77	12.79	-6.08	11.49	-7.44	14.05	-2.74	38.53	-2.75	38.50	1.66	24.93		
10 - 25	-10.31	19.47	-11.60	21.91	-16.69	31.52	-1.82	25.40	-1.68	23.56	0.72	10.89		
25 - 50	-11.67	22.04	-11.42	21.56	-10.06	18.99	-0.52	7.29	-0.53	7.40	0.32	4.78		
50 - 100	-8.42	15.89	-8.33	15.73	-7.12	13.42	-0.13	1.75	-0.14	2.03	0.82	12.34		
100 - 200	-6.44	12.16	-4.25	8.03	-3.27	6.17	-0.06	0.79	-0.05	0.55	0.03	0.40		
200 and above	-3.45	6.52	-6.33	11.95	-2.44	4.60	-0.08	1.13	-0.04	0.49	0.09	1.38		
Total	-52.95		-52.95		-52.95		-7.15		-7.15		6.64			

^aAll amounts in billions of current dollars.

Source:

Cols. 2, 8, and 12: share of various income brackets in the aggregate value of each asset calculated from data reported in Table 2.
 Cols. 4, 10, and 14: share of various income brackets in the aggregate value of each asset estimated from regression equations.
 Cols. 1, 3, 5, 7, 9, 11, and 13: derived by multiplying total amounts by the corresponding percentages.

TABLE 5. COMPARISON OF INCOME DISTRIBUTION
OF ALL ACCRUED GAINS BASED ON SFCC
AND TAX DATA FOR 1962^a

AGI (000)	SFCC	%	Tax Data	%
	(1)	(2)	(3)	(4)
0 - 5	-4.69	8.77	-3.90	7.30
5 - 10	-7.85	14.68	-7.17	13.41
10-25	-11.41	21.34	-12.56	23.49
25 - 50	-11.87	22.20	-11.63	21.75
50 - 100	-7.73	14.45	-7.65	14.31
100 - 200	-6.47	12.10	-4.27	7.99
200 and above	-3.44	6.43	-6.28	11.75
Total	-53.46		-53.46	

^aThe amounts in cols. 2 and 4 are in billions, and AGI in thousands of dollars.

Source:

Col. 1: sum of cols. 1, 7, and 11, Table 4.
Col. 3: sum of cols. 3, 9, and 13, Table 4.
Cols. 2, 4: percentages calculated from cols. 1 and 3 respectively.

IV. Income Distribution of Accrued Gains for Other Years

Using the regression equations derived above, capital gains were allocated to AGI classes for several years. The results for each asset group separately are presented in Table 6, and for all assets together in Table 7. Several interesting points emerge from these tables.

1. Individuals with income of \$25,000 or more account for more than 50 per cent of accrued gains on corporate stock every year, but less than 20 per cent of the gains accruing on nonfarm real estate, which implies that holdings of corporate stock are more concentrated among the upper income groups than those for nonfarm real estate.

2. Although the upper income groups prefer corporate stock to other types of assets, and as Table 6 shows, their proportion of gains accruing on various assets fluctuates considerably from year to year, no clear trend appears in the income distribution of accrued gains between 1955 and 1964. For all assets together (Table 7), accrued gains seem to be concentrated in the lowest three brackets: individuals with AGI of \$25,000 or less account for at least 40 per cent of total accrued gains every year, and in 1955, 1963, and 1964, their share exceeds 50 per cent of the total. These numbers, however, are likely to create a misleading impression about the importance of capital gains. In each of these years, more than 95 per cent of all tax returns were filed by individuals in the lowest three AGI classes, and when this weight of numbers is taken into account, a very different picture emerges: accrued gains per return, also reported in Table 7, increase sharply with income; consequently, accrued gains are much larger for the individuals in the upper income classes than what their share of total gains might suggest.¹²

It is important to point out that we have made no adjustments anywhere for changes in the general price level. The wholesale price index for all commodities was 87.8 in 1955 and 94.7 in 1964; the implicit price deflator for

TABLE 6. PERCENT OF TOTAL GAINS ON CORPORATE STOCK, NONFARM REAL ESTATE, AND FARM ASSETS ACCRUING TO VARIOUS AGI BRACKETS^a

AGI (\$ 000)	1955			1958			1960		
	C	R	F	C	R	F	C	R	F
0-5	9.3	32.1	45.2	8.7	26.8	45.2	9.9	23.9	45.2
5-10	10.9	37.7	24.9	10.6	39.0	24.9	11.0	38.1	24.9
10-25	20.2	16.8	10.9	21.4	21.2	10.9	23.5	25.0	10.9
25-50	21.4	8.9	4.8	19.3	8.8	4.8	20.4	9.1	4.8
50-100	14.8	2.7	12.3	19.8	2.8	12.3	14.7	2.6	12.3
100-200	9.0	1.0	0.4	8.0	0.8	0.4	7.8	0.8	0.4
200 and above	14.3	0.7	1.4	12.1	0.6	1.4	12.6	0.6	1.4

AGI (\$ 000)	1962			1963			1964		
	C	R	F	C	R	F	C	R	F
0-5	9.3	27.5	45.2	9.2	21.5	45.2	8.1	18.6	45.2
5-10	11.5	38.5	24.9	12.0	34.2	24.9	10.1	34.0	24.9
10-25	21.9	23.6	10.9	26.0	30.1	10.9	23.6	32.8	10.9
25-50	21.6	7.4	4.8	22.2	9.8	4.8	20.2	10.1	4.8
50-100	15.7	2.0	12.3	9.9	2.7	12.3	16.1	2.5	12.3
100-200	8.0	0.5	0.4	8.3	0.7	0.4	7.9	0.5	0.4
200 and above	11.9	0.5	1.4	12.3	0.6	1.4	14.0	1.4	1.4

^aThe letters C, R and F stand for corporate stock, nonfarm real estate, and farm assets, respectively.

personal consumption expenditures recorded a bigger jump--from 92.8 in 1955 to 107.4 in 1964. Clearly, income categories in current dollars do not represent the same levels of real income over the years. In fact, some individuals in income bracket \$5-10,000 in 1955, for example, might have moved up to the next higher bracket simply because of inflation even if their real income did not increase. Unfortunately, because of data difficulties, we can make no adjustments to derive income classes in constant dollars.¹³

V. ECONOMIC IMPLICATIONS

Data on the income distribution of accrued gains, derived above for various years, have far reaching economic implications, especially for personal income taxation. Some analytical uses of these results are illustrated in this Section.

Individuals report their realized gains on tax returns, a portion of such gains is taxed, but in theory there is no substantive distinction between accrued and realized gains: both can be spent with equal ease unless there are marked imperfections in the capital market. Since accrued gains will be included in a comprehensive measure of income, it is useful to compare the accruals and realizations of various income brackets (Table 8). It is interesting to note that although losses accrued to some income groups in 1960, and to all of them in 1962, no income bracket has ever reported a net loss during the years 1955-64. The decision to realize an accrued gain or loss depends on many factors like consumption plans, income from other sources, tax rate, etc. Several aspects of the relation between accrued and realized gains can be examined with the help of the data presented in Table 8.

Consider, for example, the effect of the preferential tax-treatment of realized gains. Between 1955 and 1964, gains were taxed at one-half the rate of marginal income tax, with a maximum of 25 per cent. It is often suggested

TABLE 7. CAPITAL GAINS ACCRUING TO VARIOUS INCOME BRACKETS^a

AGI (\$000)	1955			1958			1960		
	Total Gains	Per cent of total gains	Gains per return	Total Gains	Per cent of total gains	Gains per return	Total Gains	Per cent of total gains	Gains per return
0 - 5	11.78	16.3	0.3	13.68	13.0	0.4	4.52		0.1
5 - 10	12.75	17.6	0.9	13.46	12.8	0.7	6.06		0.3
10 - 25	13.69	18.9	6.4	21.41	20.3	6.4	1.42		0.3
25 - 50	12.83	17.7	41.4	18.52	17.6	50.0	-1.16		-2.6
50 - 100	8.66	12.0	111.0	19.58	18.6	217.5	-1.18		-11.8
100 - 200	4.91	6.8	288.8	7.43	7.0	371.5	-0.98		-51.6
200 and above	7.68	10.6	1,536.0	11.29	10.7	2,258.0	-1.66		-276.7
	72.30			105.37			7.02		
AGI (\$000)	1962			1963			1964		
Total Gains	Per cent of total gains	Gains per return	Total Gains	Per cent of total gains	Gains per return	Total Gains	Per cent of total gains	Gains per return	
0 - 5	-3.89	7.3	-0.1	11.63	13.1	0.3	14.10	14.4	0.4
5 - 10	-7.18	13.4	-0.3	13.25	14.9	0.6	18.33	18.8	0.8
10 - 25	-12.56	23.5	-2.0	22.33	25.2	3.0	24.81	25.4	2.9
25 - 50	-11.62	21.7	-21.5	17.54	19.8	-29.7	15.40	15.8	23.0
50 - 100	-7.67	14.3	-63.9	8.35	9.4	-64.2	11.28	11.6	70.5
100 - 200	-4.26	8.0	-202.8	6.26	7.1	-272.2	4.86	5.0	180.0
200 and above	-6.28	11.8	-46.7	9.25	10.4	-1,321.4	8.80	9.0	977.8
	-53.46			88.61			97.58		

^aTotal gains are in billions of dollars, and gains per return are in thousands.

that accrued gains should be taxed like any other income, which implies that the full marginal rates of tax will apply. One measure of tax-advantage, thus, is the difference between the marginal rate of tax and the rate applicable to realized gains. If t^* is the measure of tax-advantage, and t_i is the marginal rate of tax applicable to i^{th} income class, we have:

$$t^* = \frac{1}{2} t_i, \quad \text{for } t_i \leq 50\%$$

$$\text{and} \quad = t_i - 25\%, \quad \text{for } t_i > 50\% .$$

If t^* plays an important role in the decision to realize an accrued gain, other things being equal, we should expect that the ratio of accruals to realized gains (A/R) will decrease as we go up the income scale. And in Table 7, this ratio is smaller for the upper income groups than for the lower income brackets in most years.¹⁴

The nominal rate structure of personal income tax is highly progressive but many exemptions, special provisions, etc., have been introduced which have lowered the effective rate of tax, especially for higher income brackets. Pechman showed that the maximum average effective rate for any income class in 1962 was less than 30 per cent, and the tax became slightly regressive above \$200,000 of income.¹⁵ Pechman, however, included all realized and not accrued gains in this computation. The results are bound to change when accrued gains are included in adjusted gross income as in Table 9. It is clear that in years of large accrued gains, the effective rate of tax is reduced drastically--from 63.2 to 12.5 per cent in the highest income bracket in 1955, and from 60.3 per cent to 12.6 per cent in 1963.

If capital gains are taxed on accrual instead of realization, two problems become obvious immediately. Firstly, in years when losses accrue,

TABLE 8. ACCRUED AND REALIZED GAINS OF VARIOUS INCOME BRACKETS^a

AGI (\$000)	1955			1958			1960		
	A	R	A/R	A	R	A/R	A	R	A/R
0 - 5	11.78	1.22	9.6	13.68	1.45	9.4	4.52	1.57	
5 - 10	12.75	1.32	9.6	13.46	1.20	1.1	6.06	1.30	
10 - 25	13.69	1.91	7.2	21.41	1.78	1.2	1.42	2.07	
25 - 50	12.83	1.40	9.2	18.52	1.15	9.7	-1.16	1.35	
50 - 100	8.66	1.14	7.6	19.58	1.05	18.6	-1.18	1.25	
100 - 200	4.91	0.82	6.0	7.43	0.71	10.5	-0.98	0.90	
200 and above	7.68	1.52	5.0	11.29	1.24	9.1	-1.66	1.94	
	72.30	9.33	7.7	105.37	8.58	12.3	7.02	10.38	
<hr/>									
	1962			1963			1964		
	A	R	A/R	A	R	A/R	A	R	A/R
0 - 5	-3.89	1.47		11.63	1.53	7.6	14.10	1.48	9.5
5 - 10	-7.18	1.14		13.25	1.51	8.8	18.33	1.64	11.2
10 - 25	-12.56	2.26		22.33	2.99	7.5	24.81	3.35	7.4
25 - 50	-11.62	1.48		17.54	1.85	9.5	15.40	2.52	6.1
50 - 100	-7.67	1.35		8.35	1.58	5.3	11.28	2.05	5.5
100 - 200	-4.26	1.06		6.26	1.15	5.4	4.86	1.48	3.3
200 and above	-6.28	2.25		9.25	2.24	4.1	8.80	3.19	2.8
	-53.46	11.01		88.61	12.85	6.9	97.58	15.71	6.21

^aThe letters A and R stand for accrued and realized gains respectively. The amounts of gains are in billions of dollars.

as in 1962, the effective rates of tax exceed the nominal rate; and secondly, the taxable income becomes zero, or even negative, in some years. The results in Table 9 merely illustrate a point. No one seriously suggests that capital gains should be taxed on accrual in the manner assumed for the calculations in Table 9, without any limitation on deducting losses, averaging provision, and adjustments for changes in the general price-level.

VI. A CRITIQUE

This paper has been in the nature of a fact finding study. Although significant facts about the income distribution of accrued gains have been established, it must be kept in mind that we are dealing with an important but complex problem, with enormous data difficulties. A lot of careful research has been devoted to the methodology and data sources; hopefully, in these respects, the present study marks a significant improvement over its predecessors, but the results need to be interpreted with care. In particular, the following points ought to be noted:

1. Our method of allocating accrued gains attributes either gain or loss to all income brackets for individual assets. In other words, if there are accrued gains in the aggregate on an asset (e.g., corporate stock in 1964), the possibility is ruled out that any income bracket would have suffered an accrued loss on that asset. In years of relatively large changes in asset-prices, the experience of individual income brackets is not likely to differ from the aggregate experience, but when asset prices fluctuate mildly, it is possible that some may have accrued gains when losses accrue to others. If micro data on asset holdings were available for several years, we could perhaps test if our assumption causes any marked distortion in the final results. In the absence of such data, we can only note that, like an

TABLE 9. EFFECT ON AVERAGE TAX RATES OF INCLUDING
ACCRUED GAINS IN TAXABLE INCOME ^a
(Percent)

AGI (\$000)	1955		1958		1960		1962		1963	
	A	E	A	E	A	E	A	E	A	E
0-5	20.1	15.4	20.2	14.4	20.2	17.8	20.2	23.5	20.0	14.5
5-10	20.4	16.5	20.5	17.1	20.5	19.1	20.6	28.6	20.6	17.9
10-15	23.1	14.6	22.8	13.9	22.6	22.4	22.5	29.4	22.5	17.1
25-50	31.4	13.4	31.7	11.3	31.4	37.3	31.4	*	31.4	15.2
50-100	43.8	15.3	43.3	9.0	42.9	64.4	42.9	*	42.7	20.6
100-200	53.8	15.6	53.7	11.3	53.6	*	53.0	*	53.2	15.6
200 +	63.2	12.5	64.0	7.9	60.8	*	59.7	*	60.3	12.6
Total	23.4	15.3	23.3	13.8	23.2	22.9	23.4	33.5	23.4	16.8

^aLetters A and E stands for average and effective tax rates respectively.

$$\text{Average Rate} = \frac{\text{Total Income Tax}}{\text{Total Taxable Income}}$$

$$\text{Effective Rate} = \frac{\text{Total Income Tax}}{\text{Taxable Income} - \text{Realized Gains} + \text{Accrued Gains}}$$

In both cases, income tax before credits, as reported in Statistics of Income is used.

*Total income becomes negative, or tax payments exceed total income. These calculations could not be done for 1964 because the SOI data for 1964 are reported for different AGI groups than the ones used here.

average, our aggregates might conceal some differences in the behaviour of individual income categories.

2. The data compiled in the SFCC have played a crucial role throughout this study. The procedure for allocating aggregate gains to the various income classes depends heavily on the regression equations estimated from the SFCC tape. In fact, the results for years other than 1962 could not have been derived without these equations and the SOI data for various years. Therefore, our computations are subject to all the limitations of the SFCC and SOI. We do believe, however, that in spite of the deficiencies noted earlier, the SFCC and the SOI are the best source of data of their kind for the time period considered in this paper. Their shortcomings are not serious and do not wash out significant results about the income distribution of capital gains.

3. In deriving these results, we have combined data from several sources. Although every attempt has been made to match definitions and derive comparable data, many adjustments, some crucially important for the final results had to be made arbitrarily. For example, in estimating adjusted gross income from the SFCC tape, we have assumed that all couples would have filed joint returns. This is mainly a convenient assumption, because in the SFCC one figure was often reported for both husband and wife. In practice, we know that some of these individuals would have filed separate returns, in which case, the income distribution of gains would be somewhat different from the results derived above. These assumptions and adjustments have been described in detail above, and it is hoped that these can be refined in future work.

References

- [1] Bhatia, K. B., "Accrued Capital Gains, Personal Income and Saving in the United States, 1948-64," The Review of Income and Wealth (December 1970), 363-78.
- [2] _____, "Individuals Capital Gains in the United States, An Empirical Study, 1947-64," Unpublished Ph.D. dissertation, University of Chicago, 1969.
- [3] Ferber, R., Forsythe, J., Guthrie, H. W., and Maynes, E. S., "Validation of Consumer Financial Characteristics: Common Stock," Journal of the American Statistical Association (June 1969), 415-32.
- [4] Friend, Irwin, and deCani, J., "Stock Market Performance of Different Investor Groups," Proceedings of the Business and Economics Section, American Statistical Association, 1966, 44-51.
- [5] Goldsmith, Selma, Jaszi, George, Kaitz, H., and Liebenberg, M., "Size Distribution of Income Since the Mid-Thirties," The Review of Economics and Statistics (February 1954), 1-32.
- [6] Liebenberg, M., and Fitzwilliams, J. M., "Size Distribution of Personal Income, 1957-60," Survey of Current Business (May 1961), 11-21.
- [7] McElroy, M. B., "Capital Gains and the Theory and Measurement of Income," Unpublished Ph.D. dissertation, Northwestern University, 1970.
- [8] Miller, H. P., Income Distribution in the United States, Washington: U. S. Bureau of the Census, 1966.
- [9] Neil, H. E., "Effects of Inflation Upon the Incomes and Asset Values of Consumer Spending Units, 1949-1958," Unpublished Ph.D. dissertation, University of Michigan, 1960.
- [10] Pechman, Joseph, Federal Tax Policy, Washington: The Brookings Institution, 1971.
- [11] Projector, D. S., and Weiss, G. S., Survey of Financial Characteristics of Consumers, Washington: Board of Governors of the Federal Reserve System, 1966.
- [12] Survey Research Center, Survey of Consumer Finances, Ann Arbor: University of Michigan, various years.
- [13] U. S. Treasury Department, Statistics of Income, Individual Income Tax Returns, Washington: U. S. Government Printing Office, various years.

Footnotes

¹For example, accrued gains will be included in the Haig-Hicks concept of income. Whether capital gains are a part of income or not, however, is a controversial subject. For a discussion of the controversy, see Bhatia [1], and McElroy [7], ch.

²One exception is provided by McElroy's unpublished Ph.D. dissertation [7] which is based on some of the data used here. McElroy's measures of income and aggregate accrued capital gains, however, differ from those in this paper: he allocates gains to 'money income' classes whereas we use the concept of 'adjusted gross income.'

³Money income, as defined in the SFCC, is the total income received by all members of the family, and excludes capital gains. AGI, however, is defined by income-tax law which prescribes several adjustments (e.g., including a portion of net realized gains) that have to be made to money income to derive AGI. See, Statistics of Income, 1963, p. 21, for details.

⁴These estimates have been derived in a consistent framework, and exclude the gains accruing to nonprofit institutions which, because of a lack of data, are generally included in the household sector.

⁵A follow-up study was conducted by Ferber et al. [3] to validate the SFCC data on savings and the size of holdings of common stock by comparing the reported estimates with the institutional records for these assets. The report revealed several non-response errors, nonreporting seemed to increase with economic status (as measured by batches of shares owned), and nonrespondents, on average, owned larger amounts of corporate stock than respondents. These findings do undermine the utility of the SFCC data, but the validation study, although showing that nonreporting increased with economic status, does not reveal how these errors change from one income class to the next, and, more importantly, there is no information on how these errors should be rectified in the SFCC data. Under the circumstances, therefore, we can do no more than note that the SFCC data probably understate the asset holdings of upper income groups, and consequently their share of aggregate accrued gains is also likely to be understated.

⁶McElroy used only the published SFCC data for allocating accrued gains; therefore, in deriving results for years other than 1962 he was constrained to assume that the 1962 income distribution of wealth held for other years also. We have estimated regression equations relating various types of wealth to income and its components from the cross-section data on the SFCC tape for 1962. The McElroy assumption is thus replaced by the less restrictive assumption that the functional relationship between wealth and income for 1962, and not necessarily the actual income distribution of wealth for 1962, holds for other years.

⁷Let G_i^R and G_i^Y represent the gains accruing to i th income bracket estimated by the regression and the yield methods respectively. The superscript c is dropped to keep the notation simple. Then, if G represents all stock market gains,

$$G_i^R = \frac{W_i}{\sum_i W_i} \cdot G, \text{ and}$$

$$G_i^Y = \left(k - \frac{D_i}{W_i} \right) \cdot W_i$$

$$\begin{aligned}
&= \frac{W_i}{\sum W_i} \left(\sum_i D_i + \sum_i G_i - \frac{D_i \sum W_i}{W_i} \right) \\
&= G_i^R + m_i \sum_i D_i - D_i
\end{aligned}$$

where $m_i = \frac{W_i}{\sum W_i}$ is the proportion of all stock outstanding owned by the i^{th} income bracket. If $D_i = m_i \cdot \sum D_i$, $G_i^y = G_i^R$. Q.E.D.

⁸See Friend and deCani [4], pp. 45-48 for a self-appraisal of their findings.

⁹The weighted mean income for individuals with AGI of \$100,000 or more, which comes to about \$5.34 billion, is probably due to very large amounts of realized gains reported by a very small number of respondents.

¹⁰All these items are described in detail in [11], and the Brookings manual on the SFCC tape.

¹¹Similar calculations, based on the yield method, were performed for other years also. The results, although not presented in this paper, come quite close to those derived from the regression method.

¹²This conclusion is reinforced by the fact that accrued gains also form a much larger proportion of income in the upper income brackets, although these numbers have not been presented here.

¹³An alternative way of making consistent comparisons, although it does not adjust for inflation, is to compare income or capital gains accruing to various population percentiles. This cannot be done with the tax data employed here, but it will be attempted in a subsequent study.

¹⁴This statement holds for 1955, 1958, 1963, and 1964--years during which gains accrued on all the three asset categories, but even in these years, in some cases, the A/R ratio increases as we ascend the income scale. Obviously, there are factors other than tax advantage at work.

¹⁵Repeating the same calculation for 1966, based on the provisions of the Tax Reform Act of 1969, Pechman noted that "the maximum average effective rate for any income class is about 34 per cent," whereas the nominal tax rates would begin at 14 per cent and rise to almost 70 per cent in the very highest income brackets. See [10], p. 68.

¹⁶These numbers are based on aggregates reported in the Statistics of Income, and merely suggest the orders of magnitude. Pechman's results were based on a sample of tax return in which adjustments were made on each individual return. That is clearly a more accurate method of determining the effective progressiveness of the individual income tax.