ACCRUED CAPITAL GAINS, PERSONAL INCOME AND SAVING IN THE UNITED STATES, 1948-1964

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Capital gains are an important source of personal income in the United States but they are not included in the national accounts or the official estimate of personal income and saving. Individuals report their realized gains for tax purposes but the economic theorist would include both realized and accrued gains in income. National income theorists continue to debate whether capital gains should be included in income but, because of the many conceptual and statistical problems involved in estimating capital gains, no satisfactory estimates have been developed. Consequently, the debate has stayed mainly at the theoretical level. This paper deals with the methodology of estimating accrued capital gains. A simple analytical model is developed to estimate capital gains from data on market value and net acquisitions of an asset but the model can be adapted to incorporate asset prices directly. It is shown that the methods used for estimating accrued gains in the past are special cases of the model proposed in the paper. The model is then used for estimating gains accruing to individuals in the United States on their holdings of corporate stock, real estate and livestock during 1948-1964.

During this period accrued gains have amounted to roughly five times the realized gains reported for tax purposes; corporate stock and real estate are the most important sources of capital gains and corporate stock accounts for almost two-thirds of all accrued gains. The paper goes on to examine the implications of these estimates for the existing series on personal income and saving in the United States. The inclusion of accrued gains would increase the variance in the official estimates but personal saving is affected more than personal income. The paper concludes with an evaluation of these results and some suggestions for further research.

I

Capital gains have been an important source of income for individuals in the United States in recent years. Between 1947 and 1964 realized gains have amounted to about 47 per cent of the official estimate of personal saving and although capital gains have never been larger than 3 to 4 per cent of aggregate personal income, in many years the upper income groups have realized a major portion of their income in capital gains.[1] The true change in the economic position of an individual is measured by accrued and not just realized gains. Although large amounts of realized gains have been reported for tax purposes, they understate the importance of capital gains. The results derived in this paper, as also in many other studies, show that realized gains have been much smaller than accrued capital gains.[2]

[1]During 1960-1964 for example, capital gains realized by individuals with an adjusted gross income of $200,000 or more amounted to almost twice the income realized by them through any other source. This is based on data reported in [18].

[2]During 1947-1964 average capital gains realized and reported by individuals on their income tax returns amounted to $8.5 billion compared to $0.5 billion during 1917-1946. But accrued gains have been much larger. Gurley [7], for example, estimated that, for the period 1955-1965, the true capital gains were about six times the reported realized gains.

The official estimates of personal income and saving in the United States include neither realized nor accrued capital gains. Very few satisfactory estimates of accrued gains exist and capital gains are not taken into account at all in the national accounts. National income theorists continue to debate whether capital gains are a component of national income or not. However, because of the importance of capital gains it is felt that if the many theoretical and empirical problems involved in estimating accrued gains can be tackled, capital gains should be incorporated into the national accounts even if they are not included in national income.[3] This paper presents a simple analytical model for estimating accrued gains and losses which is then used to compute capital gains accruing to individuals in the United States during 1948–1964. Section II examines the controversy about incorporating capital gains into national accounts; section III deals with various definitions of capital gains; the methodology of estimating gains and losses is discussed in section IV; the actual estimates of accrued gains and losses are derived in section V and section VI examines their implications for the official estimates of personal income and saving in the United States. For brevity the term "gains" is used to refer to both capital gains and losses.

II. Capital Gains and National Income Accounts

Whether capital gains should be included or excluded from national income has been a long standing controversy in the annals of national income accounting. Those who wish to exclude capital gains generally argue that capital gains do not represent any productive activity, are subject to large fluctuations and significant conceptual and statistical problems arise in measuring them. Proponents of this view count among their ranks eminent national income theorists like Kuznets who argues that capital gains are mainly transfer items.[4] Equally cogent arguments are advanced to refute these points. Palmer asserts that the productivity argument is similar to the reasons once advanced to exclude services like warehousing from production; it stems from a lag in extending the meaning of productivity.[5] Fluctuations in capital gains are not objectionable as long as they reflect real changes in the underlying economic forces and to the extent that capital gains are transfers from the nonpersonal to the personal sector of the economy, they should be included at least in personal income and saving.[6] According to this argument the official estimates grossly understate the true personal income and saving in the United States because accrued capital gains are not included in personal income, and saving is estimated by subtracting personal outlays from personal income.

There are other reasons also for including capital gains in income. Theoretically an individual's income should be defined as the maximum amount which he

[3]Jaszi [8], p. 93.
[4]See the discussion by Groves, p. 246, and Kuznets, p. 250 in [4].
[5]Palmer [11]. With respect to the productivity criterion, Palmer further states that in many cases capital gains represent the monetary value of some nonmonetary inflows. He cites the example of increase in efficiency and profit potential of a corporation caused by administrative reorganization. There is no resulting physical output but this would be reflected in the value of the company's stock. *Ibid.* p. 368.
[6]*Ibid.*

can consume during a period without reducing his net worth. This is the income concept relevant for explaining economic behaviour and would include capital gains. Moreover, in the United States capital gains have accrued mostly to upper income and wealth brackets. The current scheme of taxing gains provides a strong incentive for the upper income groups to convert income into capital gains. If gains are excluded from personal income the income and saving of these income groups will be incorrectly estimated and, what is more important, measures of income inequality derived from these estimates will be highly inaccurate.

Studies of the size distribution of personal income in the United States have either excluded capital gains or included only realized gains[7] which, as has been noted above, are much smaller than accrued gains. But income distribution of accrued capital gains will have to be estimated before they can be incorporated, into studies of this type. In this paper we do not estimate accrued gains by income brackets. We are concerned mainly with total capital gains and their implications for the existing estimates of aggregate personal income and saving. In this context it is curious that while capital gains are not included, taxes paid on them by individuals are deducted to estimate personal disposable income in the United States.

III. DEFINITIONS

Capital gains can be defined in many different ways and this is one reason why there has been so much controversy about their inclusion in the national accounts. Change in the price of an asset is a measure of capital gain on that asset during a given period of time. Often capital gains are defined to include corporate stock or a few other assets and the definition can be extended to include changes in net worth in which human wealth could also be incorporated, but markets for "capitalizing" human wealth are notoriously imperfect and it would be very difficult to estimate capital gains on human wealth empirically. The distinctions between realized and unrealized gains, between expected and unexpected gains and between real and nominal capital gains are familiar, and under any of these definitions capital gains can be studied for all or individual sectors of the economy.

A comprehensive definition was offered by Goldsmith who estimated capital gains by subtracting net saving or dissaving from the change in net worth between two points in time.[8] The change in net worth during a period can be broken down into four components: (1) net saving or dissaving (excluding capital gains); (2) realized capital gains and losses; (3) transfers (i.e., transactions without economic counter value like gifts, bequests, etc., that cause a change in the holdings of assets and liabilities of the various sector); and (4) unrealized capital gains and losses.[9] If we consider the combined net worth of all the sectors of the economy, transfers cancel out and by subtracting net saving or dissaving from the change in net worth we have a measure of realized and unrealized capital gains.

[7]See for example Liebenberg and Fitzwilliams [9].
[8]Goldsmith [5], pp. 196–197.
[9]Goldsmith and Lipsey [6], p. 119.

A broad definition of this type thus incorporates capital gains on all assets and liabilities. It would be useful, for example, in analyzing the effects of inflation on the various income and wealth groups[10] because inflation affects different assets and liabilities differently. Similar measures of capital gains have been used to supplement the *conventional* income of farmers to derive a complete income picture[11] which would form the basis of studies of income parity between the farm and nonfarm sectors.[12]

The legal definition of capital gains in the United States is much narrower and includes only realized gains on a few assets. For tax purposes, changes in the price level are not allowed for so that the relevant variable is "nominal" or "money" capital gains. But in making their decisions, individuals are likely to be guided more by real than by nominal magnitudes if we assume that they are free from "money illusion." Therefore, it is necessary to distinguish between real and nominal capital gains in some cases. Real capital gains are nominal capital gains corrected for changes in the purchasing power of money. It is also useful to distinguish between expected and unexpected or "windfall" capital gains because the two types of gains will play very different roles in spending decisions and in resource allocation.

However, from the point of view of national income accounts the crucial distinction is between realized and unrealized or rather between accrued and unrealized capital gains. In the United States only a portion of realized capital gains is taxed and substantial amounts of gains escape taxation altogether. Therefore, a lot of attention has been devoted to the problem of estimating unrealized gains. But for all intents and purposes accrued gains (whether realized or not) represent the true change in the economic position of an individual. Moreover, capital gains realized in a given year could accrue over a number of earlier years but the time period relevant for national income accounts is one year. Therefore, "accrued capital gains" is the most appropriate definition to include in personal income. The distinction between nominal and real capital gains would also become important if personal income had to be stated in real terms. For the estimates derived here, however, we adopt the definition of nominal capital gains.

Some of these definitions are articulated more fully in the following section where alternative methods of estimating accrued capital gains are also discussed.

IV. THE METHODOLOGY

Several approaches have been suggested in the literature to estimate accrued capital gains. Gains have been estimated from data on saving and net worth changes, from value series in current and constant prices, and from data on market value of assets and indices of asset prices. This section presents the basic model used in our computations which is then compared with the methods already in use.

[10]Neil [10].
[11]Boyne [3].
[12]See, for example [14].

The General Model

Capital gains on any asset in a given period can be estimated from data on market value of stock outstanding, net additions to its stock during the period and an index of asset price.

Let

V_t = the market value of stock outstanding at the end of year t,
N_t = value of gross additions to the asset stock in year t,
D_t = value of gross deductions from the asset stock in year t,
G_t = the amount of capital gains (realized and unrealized) in year t,
P_t = the average price at the end of year t.

As a first approximation

$$(1) \qquad G_t = V_t - V_{t-1} - N_t + D_t$$

$$(2) \qquad = V_t - V_{t-1} - A_t$$

where $A_t = N_t - D_t$ is the net investment in the asset during year t.

Several assumptions about the timing of A_t can be introduced:

(1) It can be assumed that all net investment takes place at the end of the period. Let $A_t{}^* =$ the year-end value of net additions to the asset stock during t.

(2) It can be assumed that all net additions take place at the beginning of the period $(A_t{}^b)$. In this case,

$$(3) \qquad A_t{}^* = A_t{}^b \cdot \frac{P_t}{P_{t-1}}.$$

(3) It can be assumed that the distribution of N_t and D_t is rectangular. In this case net additions to the stock of the asset, on an average, would be held for half the period.

$$(4) \qquad A_t{}^* = A_t + \frac{1}{2}(A_t) \cdot \left(\frac{P_t}{P_{t-1}} - 1\right)$$

$$= A_t\left(\frac{1}{2} + \frac{P_t}{2P_{t-1}}\right).$$

(4) Any one assumption for A_t implies the same assumption for N_t and D_t. But different assumptions can be made for additions to and deductions from the stock of an asset. Thus, if N_t has a rectangular distribution and D_t occurs at the beginning of year t

$$(5) \qquad A_t{}^* = N_t\left(\frac{1}{2} + \frac{P_t}{2P_{t-1}}\right) - D_t\left(\frac{P_t}{P_{t-1}}\right).$$

(5) So far it has been assumed implicitly that N_t and D_t have the same price. The average price of new additions $(P_t{}^n)$ could be different from the average price of units removed from the asset stock $(P_t{}^d)$. If in year t deductions occur at time $t1$ and additions at $t2$,

$$(6) \qquad A_t{}^* = N_t \cdot \frac{P_t}{P_{t2}} - D_t \cdot \frac{P_t}{P_{t1}} = A_t\left(\frac{1}{2} + \frac{P_t}{2P_{t-1}}\right).$$

To estimate capital gains according to equation (2) on the initial stock of an asset and net changes in it over a period of time, additions and deductions should be valued at prices that are prevailing at the time of changes in the stock of the asset. In other words, the assumptions about the timing of additions to and deductions from the initial stock should be consistent with the prices used for estimating their market values—N_t and D_t. But to exclude capital gains on net changes in the stock of an asset, A_t should be replaced by A_t^* in equation (2).

Nominal and Real Gains

In the above analysis, gains and losses caused by changes in the general price level have not been separated from other gains. Real capital gains G_t^* have been defined above as nominal capital gains corrected for changes in the "value of money." G_t^* can be estimated by expressing all variables in equation (2) in terms of prices at one point in time. For example, if end-of-period price level is chosen and it is assumed that net acquisitions occur at the beginning of the period,

(7)
$$G_t^* = V_t - (V_{t-1} + A_t^b) \cdot \frac{I_t}{I_{t-1}}$$

where I is an index of the general price level. Or,

(8)
$$G_t^* = G_t - (V_{t-1} + A_t^b) \cdot \left(\frac{I_t}{I_{t-1}} - 1 \right).$$

Alternatively, real and nominal capital gains can be defined in the same way as real and nominal rates of interest. The real rate of interest

(9)
$$r_t = i_t - \rho_t$$

where i_t is the nominal rate of interest and ρ_t is the rate of change in price level during t. Along these lines, the rate of real capital gains accrual

(10)
$$g_t^* = g_t^n - \rho_t$$

where g_t^n is the rate at which nominal capital gains accrue during t. g_t^* can then be applied to V_{t-1} and A_t to estimate G_t.[13]

The model treats capital gains and losses symmetrically. For example, if net additions to the stock of an asset in a period exceed the change in its value over that period, there will be a capital loss. In equation (2), if

$$A_t > 0,$$
$$> (V_t - V_{t-1})$$

$G_t < 0$ and will indicate a capital loss.

[13]The assumption implicit here is that the same g_t^* applies to the initial stock of the asset as to the net additions. But a separate rate of accrual for net additions can be estimated similarly and incorporated into this approach.

Boyne's Model

David H. Boyne used data on the value of assets in current and constant prices to estimate capital gains of farm operators in the United States for 1940–1960.[14]

Let Q_t = the number of units of the asset stock at the end of year t.

$$(11) \quad V_t - V_{t-1} = P_t Q_t - P_{t-1} Q_{t-1}$$

$$= P_{t-1}(Q_t - Q_{t-1}) + (P_t - P_{t-1})Q_{t-1} + (P_t - P_{t-1})(Q_t - Q_{t-1})$$

$$= P_{t-1}Q_{t-1}\left(\frac{Q_t - Q_{t-1}}{Q_{t-1}}\right) + P_{t-1}Q_{t-1}\left(\frac{P_t - P_{t-1}}{P_{t-1}}\right)$$

$$+ (P_t - P_{t-1})(Q_t - Q_{t-1}).$$

The price appreciation component of the change in value is

$$(12) \qquad G_t = (V_t - V_{t-1}) - V_{t-1}\left(\frac{P_b Q_t - P_b Q_{t-1}}{P_b Q_{t-1}}\right)$$

where b is the base year and the constant dollar value series is expressed in year b prices.

Capital gains are

$$(13) \qquad G_t = V_t - V_{t-1}\left(\frac{P_b Q_t}{P_b Q_{t-1}}\right).$$

If there is a series showing (1) current dollar values $- V_t$ whose ith term is $P_i Q_i$; and (2) a constant dollar value series (that expresses all values in year b prices) whose ith term is $P_b Q_i$, equation (13) can be used to estimate nominal capital gains.[15] This model does not use the value of net acquisitions A_t explicitly but equation (13) is conceptually very similar to equation (2). $(P_b Q_t / P_b Q_{t-1})$ is a Laspeyre's type quantity index that uses base period prices as weights. It is really an adjustment for net acquisitions.

Equation (13) can be rewritten as follows:

$$(14) \qquad G_t = V_t - V_{t-1} - (P_{t-1}Q_{t-1})\left(\frac{P_b Q_t}{P_b Q_{t-1}}\right) + P_{t-1}Q_{t-1}$$

$$= V_t - V_{t-1} - P_{t-1}Q_t + P_{t-1}Q_{t-1}$$

$$= V_t - V_{t-1} - P_{t-1}(Q_t - Q_{t-1}).$$

But

$$P_{t-1}(Q_t - Q_{t-1}) = A_t^b$$

i.e., net acquisitions valued at prices prevailing at the beginning of the period and we are back to the general model.[16]

[14]Boyne [3].

[15]For further extensions of this model including adjustments for changes in the value of money, see *ibid.*, Chapter IV.

[16]In Boyne's formulation net acquisitions were valued at the average of beginning and end of year price $[(P_t + P_{t-1})/2]$ but this does not alter the argument in any way.

Goldsmith's Approach

To keep the notation simple, let us assume that a $\sim$ over a letter indicates summation.

Thus

$\tilde{V}_t$ = the market value of all assets in the portfolio at the end of year t.

Let L_{it} = the amount of ith liability at the end of year t, and S_{it} = the amount of net saving in ith asset during year t.

$$(15) \qquad \tilde{L}_t = \sum_i L_{it}$$

$$(16) \qquad \tilde{S}_t = \sum_i S_{it}$$

$$(17) \qquad \tilde{W}_t = \tilde{V}_t - \tilde{L}_t.$$

Total capital gains in this approach are

$$(18) \qquad G_t^g = \tilde{W}_t - \tilde{W}_{t-1} - \tilde{S}_t.$$

More of one asset can be bought by increasing the liabilities, by net saving or by selling another asset. Gross additions to the stock of assets in year t

$$(19) \qquad \tilde{N}_t = \tilde{L}_t - \tilde{L}_{t-1} + \tilde{S}_t + \tilde{D}_t$$

$$(20) \qquad \tilde{N}_t - \tilde{D}_t = \tilde{L}_t - \tilde{L}_{t-1} + \tilde{S}_t$$
$$= \tilde{A}_t.$$

In words, equations (19) and (20) say that net additions to the existing stock of assets in a year equal the net change in liabilities and the amount of savings during that year.

Substituting equation (17) into (18) and rearranging terms, we get:

$$(21) \qquad G_t^g = \tilde{V}_t - \tilde{V}_{t-1} - \tilde{L}_t + \tilde{L}_{t-1} - \tilde{S}_t$$
$$= \tilde{V}_t - \tilde{V}_{t-1} - \tilde{A}_t$$

because $\tilde{A}_t = \tilde{L}_t - \tilde{L}_{t-1} + \tilde{S}_t$. Equation (21) is analogous to equation (2). The sum of all G_t estimated according to equation (2) will yield the same result as Goldsmith's approach.

$$G_t^g = \tilde{G}_t.$$

If data on net worth and net saving are available, instead of estimating capital gains on each asset as the general model suggests, this approach can be used to estimate all capital gains accruing to the personal sector of the economy. But if Goldsmith's method is used to estimate accrued capital gains in the entire economy, special problems are likely to arise: The net worth of the economy cannot be derived by a simple addition of the net worth of each individual sector. The presence of firms, especially unincorporated enterprises, will result in some double counting which may be difficult to correct.

The alternative techniques of estimating capital gains thus are variations of the same basic model and the choice between them depends mainly on the scope of the study and the available data. Goldsmith's "net worth approach" will not be

very useful in the case of individuals' capital gains which is the main interest of this study because no good estimates of individuals' net savings are available for the entire period of this study. Value series in current and constant prices which are essential for Boyne's approach can be obtained only for one or two assets for a few years. Data on market value, net acquisitions and prices of individual classes of assets, however, are relatively better and these are the three basic inputs of the general model presented above. This model is modified where necessary to estimate accrued capital gains on various asset-types owned by individuals in the United States during 1948–1964.

V. The Actual Estimates

Corporate stock, real estate and livestock have been the most important sources of capital gains for individuals in the United States. During 1959 and 1962, the only two years for which realized gains have been reported for various asset categories, these assets accounted for roughly 60 per cent of all realized capital gains.[17] Between 1948 and 1964 the market value of corporate stock held by individuals has increased by more than five times. Net acquisitions have contributed less than 5 per cent to the increase in market value so that large amounts of gains have accrued on corporate stock. Real estate has also been an important source of accrued gains. These asset-types thus will probably account for a large proportion of total accrued gains also.

For a complete study, capital gains should be computed on all assets and liabilities. Although the model presented above is quite general, comparable data on V_t, A_t and P_t are not available for other classes of assets. Even for the assets for which capital gains have been computed here, data had to be pieced together from numerous sources and often primary data had to be used.[18]

Notation

Let H_t be the value of the stock of an asset held by individuals and O_t be the corresponding value of institutional holdings or the holdings of nonindividuals. Then

$$H_t = V_t - O_t.$$

Let us also introduce superscripts c for corporate stock, r for nonfarm residential real estate, f for farm real estate and l for livestock. These superscripts are used with the variables defined above to denote the various types of assets.
For example,

H_i^c = the value of corporate stock held by individuals at the end of year t,
A_t^r = the value of nonfarm residential real estate acquired by individuals during year t,
P_t^f = the average price of farm real estate at the end of year t, and
G_t^l = capital gains accruing to individuals on livestock during year t.

[17]Based on data reported in [17].
[18]The actual data adjustments are far too many to be discussed here. They are described in detail in Bhatia [1], Chapters IV, V and VI.

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Some problems arising in the actual computation of capital gains are briefly discussed below.

Corporate Stock

Thanks to the active stock markets and regulatory agencies like the Securities and Exchange Commission (SEC), a lot of information on the value of corporate stock outstanding (V_t^c) and stock prices is available but the data provided by various sources often differ considerably. For example, the value of the household sector's holdings of corporate stock (H_t^c) estimated by the SEC and in the flow-of-funds accounts differs by $50 billion in some years. The most commonly used stock price index—the Standard and Poor's composite 500 stock price index (S and P 500) is based only on 500 common stocks listed on the New York Stock Exchange and may not reflect the prices of preferred shares, unlisted shares and shares listed on exchanges other than the NYSE. Data on net acquisitions also have shortcomings.

The main drawback of the SEC estimates—the inclusion of some institutional holdings in H_t^c—was corrected by making separate estimates of the value of stock held by nonprofit institutions. Preferred and unlisted shares are a small fraction of H_t^c and a comprehensive index like the NYSE index which is based on all the stocks listed on the New York Stock Exchange is very similar to the S and P 500. Thus any error caused by using S and P 500 is likely to be very small. However, unlike the estimates of H_t^c it has not been possible to adjust the data on net acquisitions and there are no alternative estimates of A_t^c. Therefore, one can have greater confidence in the data on H_t^c and P_t^c rather than A_t^c. The basic model was modified accordingly to incorporate a price index and accrued gains were estimated as follows:

$$(22) \qquad G_t^c = H_{t-1}^c \left(\frac{P_t^c}{P_{t-1}^c} - 1 \right)$$

$$(23) \qquad H_t^c = H_{t-1}^c + A_t^c + G_t^c.$$

Equation (23) provides a check on the consistency of the results derived here because if A_t^c and G_t^c measure net acquisitions and accrued gains correctly, $\hat{H}_t^c$ should equal H_t^c.[19]

[19]The actual computations were somewhat different. Capital gains were estimated on a quarterly basis and quarterly gains were summed to derive annual estimates. In our computations $\hat{H}_t^c$ and H_t^c were fairly close but rarely equal—the maximum difference was about 6 per cent. Whenever $\hat{H}_t^c$ and H_t^c differed, we adjusted the estimated capital gains. The adjustment factor

$$f_t = \frac{H_t^c - H_{t-1}^c}{\hat{H}_t^c - H_{t-1}^c}$$

and

$$G_t^{c*} = G_t^c \cdot f_t.$$

The adjustment procedure implicitly adjusts both A_t^c and P_t^c. The unadjusted series are used merely to allocate the total change in the market value of corporate stock during a year to its two components—capital gains and net acquisitions. G_t^{c*} is reported in Table 1, column 1. Cf. Bhatia [2].

Nonfarm Residential Real Estate

When compared to corporate stock, more serious data problems arise in case of real estate. Markets for real estate are mainly local in character and not as active as the stock markets. There are several indices of construction cost but no satisfactory indices of prices of various types of real estate. Market value of some real estate assets has been estimated for a few years but there are no annual estimates of the value of real estate owned by individuals. Similarly, there is no reliable information on net acquisitions of new and existing houses by individuals during this period.

But a lot of information is available for 1950 and 1960 in the two censuses of housing. Therefore, we derived the market value of various types of real estate for 1950 and 1960 and used these as the benchmarks. Value figures for other years were computed by interpolating between and extrapolating from these benchmark estimates.[20] Net acquisitions of real estate (A_t^r) were computed by estimating the market value of new nonfarm 1-family housing units *and* the value of construction put in place for larger structures.[21] Accrued capital gains were estimated according to equation (2),

$$G_t^r = H_t^r - H_{t-1}^r - A_t^r.$$

Capital gains on farm real estate and livestock were also computed by using equation (2). Data on market value of all farm assets appear in the *Balance Sheet of Agriculture* and information on net acquisitions was obtained from the U.S. Department of Agriculture. Several adjustments had to be made to correct some inconsistencies in these series but all the calculations were based on the official data series.[22]

These estimates of capital gains accruing to individuals are presented in Table 1. The aggregate capital gains (Table 1, column 5) are

$$G_t = G_t^c + G_t^r + G_t^f + G_t^l.$$

The estimates developed here show that between 1948 and 1964 accrued net capital gains on corporate stock, real estate, and livestock owned by individuals in the United States have amounted to $682.46 billion. It implies that on average gains have accrued at the rate of roughly $40 billion a year during this period. Net losses have accrued in only four years and except in 1962 the amount of losses has been much lower than the average amount of net gains during 1948–1964. Corporate stock and real estate are the most important sources of capital gains and although in some years accrued gains on real estate exceed those on corporate stock, corporate stock accounts for more than 60 per cent of the accrued

[20]Data reported in the various *Surveys of Consumer Finances* [13] were used in deriving the annual estimates. This is the "Census and Survey" method outlined in [6], Appendix A. For a review of earlier estimates of market value and details of the estimates derived here, see [1], Chapter V and Appendix B.

[21]Data from various sources had to be combied to estimate A_t^r. The monthly series on, housing starts published in *Construction Reports* [15] was lagged four months to allow for completions. Average prices reported in the *Survey of Consumer Finances* [17] for 1957–1959 and *Construction Reports* [16] for 1964 were used as the benchmarks from which average prices for other years were estimated with the help of average prices of new nonfarm one-family housing units financed by the Veterans Administration. For details of calculations and a discussion of the plausibility of these results see [1], pp. 98–106.

[22]Cf. Bhatia [1], Chapter VI.

gains during this period. Goldsmith observed that between 1900 and 1949 real estate was the most important source of valuation gains for individuals.[23] The value of real estate owned by individuals still exceeds the value of their holdings of corporate stock, but due to the greater increase in stock prices in recent years, larger amounts of gains have accrued on corporate stock.

TABLE 1

ACCRUED AND REALIZED CAPITAL GAINS, 1948–1964
(billion dollars)

	Corporate Stock (1)	Nonfarm Residential Real Estate (2)	Farm Real Estate (3)	Livestock (4)	Total Accrued Gains (5)	Total Realized Gains (6)
1948	−0.65	11.89	3.11	1.2	15.55	4.20
1949	10.19	−12.41	−0.81	−1.7	−4.73	3.01
1950	23.44	15.95	6.59	3.6	49.58	5.81
1951	16.07	16.80	8.34	1.4	42.61	6.02
1952	10.47	16.88	2.43	−5.3	24.48	4.86
1953	−1.62	−4.02	−1.41	−3.0	−10.05	4.00
1954	57.18	5.35	2.15	−0.8	63.88	6.66
1955	52.37	15.98	4.55	−0.6	72.30	9.33
1956	6.34	29.36	7.29	0.7	43.69	8.97
1957	−34.65	4.90	7.33	3.1	−19.32	6.93
1958	91.89	2.43	7.85	3.2	105.37	8.58
1959	35.05	15.63	5.77	−2.9	53.55	12.33
1960	−14.40	17.51	3.61	0.3	7.02	10.38
1961	81.38	18.70	4.92	0.4	105.40	16.12
1962	−52.95	−6.75	6.34	0.3	−53.06	11.01
1963	73.91	7.85	8.75	−1.9	88.61	12.85
1964	59.07	30.42	9.29	−1.2	97.58	15.71
	413.09	186.47	86.10	−3.2	682.46	146.77

SOURCE: Columns 1–4: See text. 5: Sum of Columns 1–4. 6: Derived from [18]; various years.

The small amounts of accrued capital gains on livestock could lead to a misleading impression about the size of income derived from livestock. Cash receipts from sale of livestock have always been substantially larger than accrued gains.[24] Capital gains have been estimated here on livestock inventory left on the farms at the end of each year. Most of the gains that accrue during a year are realized by sale of livestock. In this respect there is a basic difference between livestock and real estate assets which, as fixed assets, are not depleted and replenished every year.

VI. EFFECT ON ESTIMATES OF PERSONAL INCOME AND SAVING

The official estimates of personal saving (S^p) are derived by subtracting the amount of personal outlays from disposable personal income (Y^p). Personal

[23]Goldsmith [5], vol. I.
[24]Data reported in *Farm Income Situation* (July, 1969), Table 11-H, p. 54, show that cash receipts from sale of hogs, cattle and calves, and sheep and lambs, amounted to about $9 billion in 1950, about $8 billion in 1965, and about $11 billion in 1960. The amount of accrued gains in these years was $3.6 billion, $0.7 billion, and $0.3 billion, respectively.

outlays include personal consumption expenditures (C^p), interest paid by consumers (R^p) and personal transfer payments to foreigners (T^p).

$$(24) \qquad S^p = Y^p - C^p - R^p - T^p.$$

Personal consumption expenditures are the largest component of personal outlays. The commodity flow method is used to measure consumption expenditure on commodities and the expenditure on services is estimated from various types of census and survey data. Since Y^p does not include the amount of capital gains accruing in the personal sector (G), whenever G is positive the official estimates understate the amount of personal saving and vice versa. The correct estimate of personal saving can be obtained by adding G to Y^p in equation (24).

$$(25) \qquad S^{*p} = Y^{*p} - C^p - R^p - T^p$$

where S^{*p} represents the correct amount of personal saving, and

$$(26) \qquad Y^{*p} = Y^p + G.$$

Substituting equation (26) in (25) we get:

$$(27) \qquad S^{*p} = Y^p + G - C^p - R^p - T^p$$
$$= S^p + G.$$

TABLE 2

EFFECT OF ACCRUED CAPITAL GAINS ON PERSONAL INCOME AND SAVING
(billion dollars)

	Reported Personal Income (1)	Reported Personal Saving (2)	Personal Income Including Capital Gains (3)	Personal Saving Including Capital Gains (4)
1948	210.2	13.4	225.75	28.95
1949	207.2	9.4	202.47	4.67
1950	227.6	13.1	277.18	62.68
1951	255.6	17.3	298.21	59.91
1952	272.5	18.1	296.98	42.58
1953	288.2	18.3	278.15	8.25
1954	290.1	16.4	353.98	80.28
1955	310.9	15.8	383.20	88.10
1956	333.0	20.6	376.69	64.29
1957	351.1	20.7	331.78	1.38
1958	361.2	22.3	466.57	127.67
1959	383.5	19.1	437.05	72.65
1960	401.0	17.0	408.02	24.02
1961	416.8	21.2	522.20	126.60
1962	442.6	21.6	389.54	−31.46
1963	465.5	19.9	554.11	108.51
1964	497.5	26.2	595.08	123.78
		310.4		992.86

SOURCE: Columns 1–2: *Economic Report of the President*, January,1969, Table B–15, p. 244. Column 3: Column 1 plus column 5, Table 1. Column 4: Column 2 plus column 5, Table 1.

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Thus the amount of accrued capital gains estimated here should be added to the reported estimates of personal saving to derive the correct estimates.

The official estimates of personal income and saving are presented in Table 2. Y^p and Y^{*p} are plotted in Figure 1 and S^p and S^{*p} in Figure 2 to illustrate the difference caused by including accrued capital gains in personal income and saving. Both income and saving are affected but because of the smaller magnitudes involved, personal saving is affected much more than the official estimate of personal income. Between 1948 and 1964 capital gains accruing to individuals
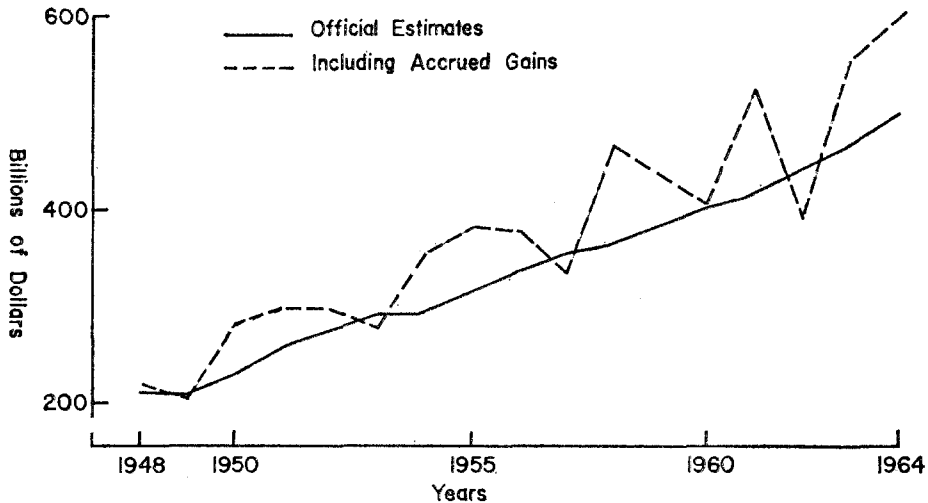

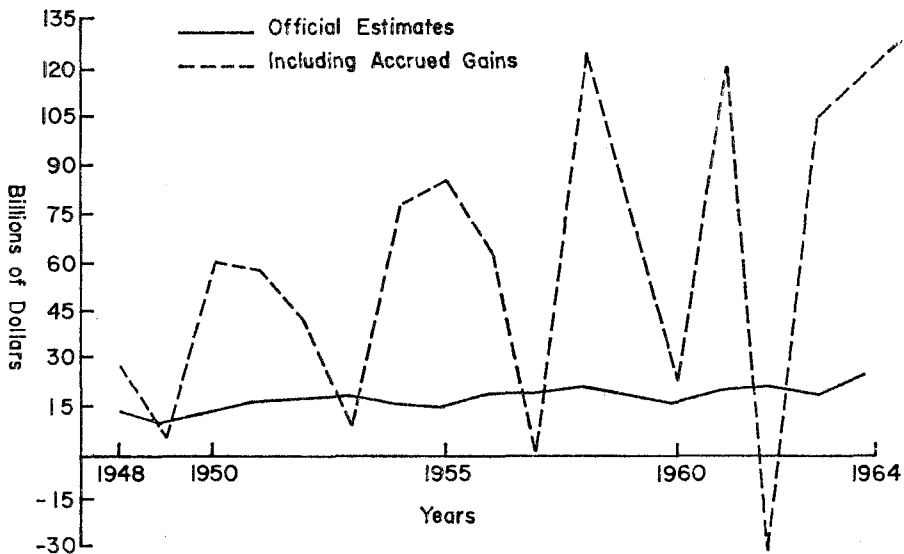Figure 1   Personal Income Including and Excluding Accrued Capital Gains (billion dollars)

Figure 2   Personal Saving Including and Excluding Accrued Capital Gains (billion dollars)

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amount to more than twice the official estimates of personal saving and when accrued gains are incorporated into personal savings, both the annual and aggregate estimates are altered significantly. In 1962 accrued losses exceed the official estimate of personal saving resulting in a net dissaving.

VII. CONCLUSION

Evaluation of the Results

This paper has concentrated on the methodology of estimating accrued capital gains and although data adjustments have not been discussed in detail, a lot of careful search and research has been devoted to making these estimates. Whenever alternative sets of data were available, a choice was made on the basis of a thorough evaluation of the quality of data and the procedures and assumptions used in deriving them. But it is very difficult to evaluate the reliability of the final results. For corporate stock the results could be checked for consistency because equations (2) and (22) provide two alternative ways of estimating accrued gains. Such alternatives are not possible for other asset classes and for this reason at least, one can have the greatest confidence in the estimates of accrued gains on corporate stock.

The final estimates of gains accruing on nonfarm real estate and farm assets could not be cross checked, but inputs like H_t^r, A_t^r, etc. have been compared with alternative estimates where possible. Estimates of net acquisitions of nonfarm real estate by individuals and net investment in farm real estate are by far the weakest and a lot of further research would be necessary to revise them. Many input series will improve in quality when the 1970 census benchmarks become available. Estimates of accrued gains on these assets, therefore, should be regarded as tentative because they are likely to change when the data series are revised.

It must be emphasized that the estimates derived here merely suggest the orders of magnitude involved in adjusting the official estimates of personal income and saving. Much more research is needed to estimate accrued gains on other asset-types and to isolate the sources of capital gains before they can be incorporated into the national accounts.

Suggestions for Further Research

There is room for considerable improvement in the data series used in deriving these estimates of accrued gains. Besides the points made above, there is immediate need to develop new indices of asset prices and improve the quality of the existing ones. The lack of good price indices has always been the bane of researchers in the area of capital gains. Price indices are not available for many types of assets and most of the indices for real estate relate to construction cost and may not reflect real estate prices properly. Development of good price indices would provide an alternative way of estimating accrued gains and checking some of the results derived here.

A more challenging job for future research is to estimate the income distribution of accrued capital gains which would have far reaching implications for

studies of the size distribution of personal income and saving, measures of income inequality and the broad area of personal income taxation in the United States. The rate structure of personal income tax is highly progressive but only a portion of realized gains is taxed. Thus large amounts of income in the upper income groups escape taxation thereby reducing the progressiveness of the tax-structure.[25]

The estimates derived here relate to the United States but the methodology is quite general and could be used to derive similar estimates of accrued gains in other countries. Of course, data problems will differ from place to place and the model presented in this paper would be a useful indicator of the type of data needed for estimating accrued capital gains.

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[25]"After allowing for all special provisions, the maximum average effective rate for any income class is less than 30 per cent and the tax becomes slightly regressive above $200,000 of income." Pechman included realized and not accrued gains in this computation. The inclusion of accrued gains would probably further reduce the effective progressiveness of the personal income-tax structure. Pechman [12], p. 65.