ADJUSTING NET WORTH FOR PRICE CHANGES WITH REFERENCE TO THE CANADIAN SYSTEM OF NATIONAL ACCOUNTS

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This paper develops a rationale for a comprehensive measure of income and provides illustrative calculations within the Canadian System of National Accounts for making adjustments to net worth for price changes.

The paper notes that the System of National Accounts is designed to provide a number of individual aggregates measuring total production, income, savings and net worth. There is no single overall comprehensive measure which reflects the combined effect of changes in income and wealth. Such a measure is of particular importance in periods of rapid or extensive price changes which affect not only purchasing power of income but also the value of assets held and liabilities outstanding with consequences on net worth positions. This paper explores these issues and develops techniques for measuring the effects of specific and overall price changes with respect to net worth of the various sectors in the economy, illustrated with data from the integrated Canadian System of National Accounts.

1. INTRODUCTION

This paper is a step towards development of techniques for measuring the effects of specific and overall price changes with respect to income and wealth for all groups of transactors in the economy in the context of the integrated Canadian System of National Accounts (CSNA). The existing national accounts concepts provide for a number of aggregates representing incomes, consumption, savings and nominal net worth. However, value changes in asset holdings and in liabilities are not taken into account when these occur as a consequence of changes in specific prices and from inflation so that the combined effect from underlying shifts in net wealth and in income positions of transactors is not fully revealed by existing concepts or statistics.

One concept which is often considered for the role of such an overall measure is that of comprehensive income, proposed by Hicks in 1946. Hicks defined comprehensive income as the maximum amount which an individual can consume during a given period, and still expect to be as well off at the end of the period as at the beginning. This Hicksian comprehensive income is, in general terms, the sum of consumption and changes in net worth over the period measured.

Hicksian income reflects the belief that in addition to conventionally measured income, changes in net worth position are also important in the decision making of individuals and other economic entities with regard to expenditures, savings, and investment. The emphasis on the importance of changes in wealth

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distinguishes this approach from numerous other studies which, with perhaps one exception, focus only on the inflationary effect on income, savings and allocation of resources in the economy.[1]

Including the introduction the paper is organized into six sections. The second section deals with basic considerations and the rationale for inflation adjustment; the next section deals with measurement in the context of the CSNA; the fourth with methodology of adjusting net worth; the fifth section provides an illustrative analysis of selected data; the sixth section is the conclusion; in addition there is a statistical appendix.

2. Some Basic Considerations in Adjusting for Inflation

2.1. *Comprehensive Income and Changes in Net Worth*

Economic behaviour, decision making and command of purchasing power are influenced not only by the size and growth of incomes, but also by the level of and changes in net wealth positions of economic units.

This is especially relevant in periods where there are diverse price movements both with respect to variations in prices of specific items and to general change in price levels, characteristic of inflation. These situations give rise to dissimilar effects on nominal values of net worth. The change in each net worth is dependent on the composition of assets held and debts outstanding and the extent to which those components have been affected by relevant price changes. These perceived reductions or accretions in nominal net worth can have a significant impact on economic decisions.

Conventionally the SNA focusses on individual aggregates of incomes, consumption, savings and net worth. It provides no single measure which encompasses changes in consumption and in wealth to enable assessment of change in the overall economic position of transactors. The concept which comes closest to meeting such a requirement is that of comprehensive income, proposed by Hicks. Hicks' exposition of comprehensive income, however, is somewhat unclear and parts of it are subject to different interpretations. One interpretation, by Peter Hill, is:[2]

> "There is substantial literature on the concept of 'income' which predates recent concerns about the measurement of income and saving under inflationary conditions. The most widely accepted definition to be put

[1]Examples of such studies include: those of the Sandilands Committee of the United Kingdom and the Canadian Institute of Chartered Accountants concerned with the consequences of historical cost accounting on corporate profits, taxes and operational viability; the report by Chant and McFetridge for the Canadian Anti-Inflation Board, which discusses the allocative effects of inflation; those of C. T. Taylor and G. V. Jump which focus on inflation effects on reported sectoral saving; and finally, from a public finance perspective, a recent article by Robert Eisner and Paul Pieper on the real value of U.S. federal government debt and Annex F of the April 1983 Canadian budget papers showing federal government deficit in inflation-adjusted terms. The exception noted above refers to Jack Hibbert's report to the OECD on a study of the effects of inflation on the measurement of income and saving.

[2]Peter Hill, Inflation, Holding Gains and Saving, *OECD Economic Studies*, No. 2/Spring 1984, OECD, Paris, pp. 151-164.

forward during these early debates was that advanced by Hicks (1946) who defined income as the maximum value which an individual can consume during a given period and still expect to be as well off at the end of the period as at the beginning. This definition can be rendered more operational by defining income as the maximum amount which can be consumed within any given period while maintaining real net worth intact, which in turn can be translated into actual consumption plus the change in real net worth."

From Peter Hill's interpretation above it is clear that there are two important components of comprehensive income, actual consumption and change in real net worth. In this paper it has been possible only to state the general concept of comprehensive income, articulate the issues involved in the derivation of changes in real net worth and illustrate this by statistical implementation.

Changes in net worth can be readily perceived as being important because net worth, the difference between assets and liabilities, represents the net wealth position of economic units or in aggregate form, of sectors. Assets held in one form or another represent accumulated value, and liabilities outstanding indicate claims or legal obligations which must be met. This net worth or proprietary right to command resources provides an indication of the ability of economic transactors to implement economic decisions.

Two types of price changes with potential effect on net worth are considered in this paper. The first of these pertains to changes in prices of specific items or in prices of items related directly to the price movement of items under consideration, such as, for example, changes in interest rate to prices of long-term fixed-money assets held in investment portfolios. Using long term marketable bonds as an example of fixed-money assets, differences between going long-term interest yield rates and rates which prevailed at the time of acquisition of such bonds result in changes between their purchase and market values when the market value is taken at going market quotations. The specific relationship between movements in yield rates and market prices is discussed more fully in the next section. At this point it is sufficient to note that an increase in yield rates is associated with a drop in the value of the instrument and a decline in yield rates with a value increase. Hence one consequence of changes in interest yield rates is a change in net worth.

This effect on net worth, however, is not as clear cut in the case of bonds where the liability of the original issuer remains at the nominal issue price on the books of the issuer and the repayment obligations remain unchanged until maturity date. It has been argued that during the life of the bond the nominal value of the obligation is invariant to changes in market interest yields and therefore the debt figures should not be changed. It can also be argued, however, that if interest rates rise the market places a lower value on the debt obligation represented by the outstanding issue and in such a case, the net worth position of the issuer can be said to have improved relatively to the general economic situation. This is because the issuer can, if he wishes and to the extent available, purchase back his own bonds on the open market at the lower price. Further, even if he opts not to enter the market his competitive position is improved since

the relative cost of servicing this debt is lower thereby enhancing his profit position in relation to others who are obliged to borrow at market rates. On this basis, it is concluded that fixed-money liabilities should be treated in the same way as fixed-money assets, that is, adjusted for changes in yield rates even though nominal values remain constant.

A second factor which has the same influence on all values is inflation, i.e. a rise in the general price level which lowers the value of the purchasing power of the monetary unit. Under inflationary conditions holders of fixed value financial assets implicitly suffer a reduction in the value of their holdings, while debt obligations of borrowers are reduced. The result is a reduction of net worth for asset holders and a gain for debtors.

Holders of tangible assets, on the other hand, may experience either a net gain or loss in the marketable value of their holdings. This depends on whether changes in the specific prices of their assets are larger or smaller than the general change in prices.

Thus, whether due to changes in specific prices or changes in the general price level through inflation, changes in the value of assets or liabilities give rise to implicit transfers of wealth between lenders and borrowers of financial resources, with consequent effects on their net worth and economic behaviour. As well there may also be a change in their positions relative to that of others who hold assets.

2.2. *Comprehensive Income—Simple Illustration*

Although full procedures for the derivation of comprehensive income are not worked out in this paper the need for the use of a comprehensive income concept in contrast to conventional measures of income for economic analysis might be understood better by a simple example of a person's financial accounts say in periods t−1 and t shown below on both bases.

On a Conventional Basis (in dollars)

	Year t−1	Year t	Changes Between t−1 and t
Income	20,000	20,000	—
Consumption	20,000	30,000	+10,000
Assets:			
House	150,000	150,000	—
Bonds	5,000	5,000	—
Liabilities:			
Mortgage	50,000	50,000	—
Short-term loan	—	10,000	+10,000
Net Worth (Assets − Liabilities)	105,000	95,000	−10,000

In the above case consumption between period t−1 and t has increased by $10,000 whereas income has not. The shortfall has been met by a loan of $10,000 resulting

in a drop in net worth of a like amount. It is assumed, however, that in the two periods there were also changes in relevant prices which contributed to an underlying change in this person's economic position and command over purchasing power. For illustrative purposes the relevant price indexes are as follows:

Price indexes	t−1	t
Index of residential construction	100.0	110.0
Long-term bond yields (%)	8.0	10.0
Mortgage rates (%)	12.0	15.0
G.N.E. Implicit Price	100.0	105.0

Applying the Hicksian form of comprehensive income to this case, *i.e.* actual consumption plus change in real net worth, would result in calculations shown in Chart 1.

The adjustment calculations in the chart are obtained as follows. The index of residential construction has moved from 100 to 110; it is assumed, therefore, that the replacement value of this person's $150,000 house has increased by $15,000. In order to simplify the model depreciation on the house has not been taken into account. In the case of bonds, an increase in long term interest yields from 8 to 10 percent has reduced the market value from $5,000 to $4,000. The reduction is based on the fact that at 10 percent, $4,000 yields an interest of $400, the same as $5,000 did at 8 percent. The rationale for the mortgage adjustment is similar to that applicable to bonds, although it might be argued that mortgages do not enjoy a ready after-market. Finally, all items are subjected to the GNE implicit price adjustment to reflect erosion from general inflation in the purchasing power value of dollar denominated assets and liabilities.

Change in the net worth of this household may be analysed either in the conventional way or by taking into account changes in the implicit market value of its assets and liabilities. The two methods yield considerably different results. For example, as noted from Chart 1, the conventional approach yields a reduction in net worth of $10,000. Application of adjustments to values, however, results in a positive change in net worth of $8,334, the difference between $105,000 at the end of year t−1 and the adjusted position of $113,334 or the end of year t. The amount of the change, calculated at end of year t−1 prices, i.e. those prevailing at the beginning of period t, is composed of a gain of $5,953 in assets, plus a drop of $2,381 in liabilities. In this example, although a $10,000 loan ($9,524 in t−1 prices) was incurred in year t, there was a net drop of $2,381 in total liabilities because of the drop in mortgage debt of $11,905, expressed in t−1 terms.

If one were to proceed towards a derivation of Hicksian comprehensive income, a concept still in the discussion stage, a comprehensive income of $38,334 is obtained, compared to the conventionally measured income figure of $20,000.

2.3. *Implicit Price Indexes in Adjustment Calculations*

Under conditions of rapid or widespread movement in prices current value series become unsatisfactory as a measure of growth since the underlying "real"

CHART 1

DERIVATION OF REAL CHANGE IN NET WORTH (IN DOLLARS)

	Unadjusted Balance Sheet		Adjustment to Balance Sheet			Change
	Year t−1 (1)	Year t (2)	Gain/Loss re Changes in Specific Prices (3)	Gain/Loss re Inflation (4)	Year t Adjusted (5) = (2) + (3) + (4)	t−1 Unadjusted to t Adjusted (6) = (5) − (1)
Assets						
House	150,000	150,000	15,000	−7,857	157,143	7,143
Bonds	5,000	5,000	−1,000	−190	3,810	−1,190
	155,000	155,000	14,000	−8,047	160,953	5,953
Liabilities						
Mortgage	50,000	50,000	−10,000	−1,905	38,095	−11,905
Short-term Loan	—	10,000	—	−476	9,524	9,524
	50,000	60,000	−10,000	−2,381	47,619	−2,381
Net Worth	105,000	95,000			113,334	
Change in Net Worth t−1 to t		−10,000				+8,334

changes are masked or obscured by price movements. In this sense "real" refers to quantity or volume represented by value expressed in constant prices. Series in constant prices are obtained by deflation, that is, dividing current market value expenditure by changes in appropriate price indexes.

Specific price indexes are suitable for depicting changes in prices of a single commodity or a group of homogeneous commodities. This approach cannot be applied, however, where dissimilar commodities are involved or where the commodity mix forming expenditure series shifts over time. For determining changes in overall prices where composite series are involved such as for example, personal expenditures on consumer goods and services, an implicit price index is used to represent a weighted average of the price indexes specific to each component series.

Implicit price indexes are current rather than base weighted. This feature is essential to the development of Hicks' concept of comprehensive income which calls for changes in real net worth from the beginning to the end of the year. This entails that price indexes used in deflation must be rebased either to the beginning or to the end of the year under consideration. In the case of composite components of net worth the rebasing of the corresponding price index is only meaningful in terms of current weights.

3. Measurement Issues in the Context of the CSNA

3.1. *The Balance Sheet*

At the time of the development of this paper only preliminary unpublished data were available and these were used for the calculation of changes in net worth.[3] The figures have not been updated partly on account of time considerations and partly because, as noted, the primary objective of this project is the development of requisite concepts and methods; the figures are for illustrative purposes only.

Although it was not possible to develop this paper to the stage of deriving comprehensive income, nevertheless it should be recognized that this concept combines data from both balance sheets and income and expenditure accounts and therefore it might be useful to differentiate some of the basic characteristics of the two sets of accounts.

First, income and expenditure accounts are concerned with measuring flows whereas balance sheet accounts are concerned with levels and composition of assets and liabilities. Thus, whereas income and expenditure accounts measure the value of transactions that occur over a period of time, the balance sheet accounts portray values of tangible assets and the composition of a sector's financial structure at a point in time. These differences have implications in the selection of price indexes for deflation and of time periods which must coincide with that of the value data.

[3]Subsequently *Statistics Canada* has published an updated version of these figures in its publication, *The National Balance Sheet Accounts 1961–1984*, System of National Accounts, catalogue number 13-214.

Secondly, the emphasis on sector categories is different between income and expenditure accounts and their balance sheet counterpart with the latter's focus on financial rather than on production and distribution aspects. In the Canadian National Income and Expenditure Accounts, for example, the production account consists of four sectors: Persons and Unincorporated Business, Government, Corporate and Government Business, and Non-Residents. In the National Balance Sheet Accounts there are thirteen major sectors which for the purposes of this paper, have been rearranged as: Persons and Unincorporated Business, Non-Financial Corporations, Banks and Near-banks, Other Financial Institutions, Governments and Rest of the World. The two sets of accounts, of course, are reconcilable although the amount of sectoral detail that is deemed appropriate for each will depend on the purpose of analysis and on the data available.

3.2. *Valuation in the Balance Sheet Accounts*

For sake of consistency and accuracy in this type of exercise, it would be preferable to have balance sheet accounts at uniform current market valuation for all assets and liabilities, across all sectors. Business financial records, however, are not kept on this basis and for many series data are just not available to enable conversion to current market values. Historical cost, i.e. at purchase prices, is the accepted method of recording acquisitions in normal business accounting. For current reporting tangible assets are shown usually at book values which may vary between historical cost and current market value.

Value variation is not a serious problem in the case of short-term financial instruments, where differences between market and book valuations are likely to be small, but on the other hand, long-term instruments usually appear in the Balance Sheet Accounts at different prices. For example, governments and corporations issue marketable bonds which stay on their books at that price until maturity as a part of their liabilities. In the meanwhile these bonds, as financial assets, may be widely traded and held in portfolios of different sectors at different values depending on prices paid at time of purchase. A further complication is the business practice of amortizing the premium or discount from par value over the remaining life of the bond. Therefore the outstandings data for a variety of long-term instruments, such as bonds, are a mixture of valuations for items which for all intents and purposes except price are otherwise identical.

Inconsistent valuation creates some distortions in matching some categories of assets and liabilities. The greatest impact probably occurs in the persons and unincorporated business sector, where data for some series of financial assets and liabilities are derived residually within the overall constraints that assets match liabilities for the balance sheet as a whole.

3.3. *Valuation and Adjustment of Net Worth*

Despite the mixture of data in the balance sheets which reflect different valuations it is contended that the adjustment of these figures to reflect yearly change in net worth is meaningful. First, and most important, the periods under consideration are in segments of one year, that is, it is the change from the

beginning to the end of the year that is being analyzed. It is felt that within the year the composition of assets and of liabilities would not change significantly. Second the magnitude of adjustments, representing capital gains and losses, depends primarily on fluctuations in prices that influence market values of certain components rather than on the incremental changes in the components. Price changes include those in interest yields which affect market values of fixed-money denominated instruments, changes in prices which affect the market value of tangible assets, and changes in general purchasing power of the monetary unit which affect all transactions and values. Third, most long-term balance sheet items are revalued infrequently; thus their contribution to a change in the aggregate is minimal. Finally short-term assets, by definition, turn over rapidly and therefore their book values appear in the records at or near market prices.

The critical requirement for the adjustments under discussion in this study is that balance sheet items, whether shown at book value or recorded on a current basis, remain at a fairly consistent valuation, at least over the intervals under consideration. On this basis it is assumed, therefore, that relevant parts of year to year changes in net worth can be obtained through the application of appropriate price indexes to balance sheet items.

3.4. *Adjustment Indexes*

Two categories of adjustments were carried out. First, capital gains and losses on tangible assets and on long-term financial assets and liabilities were calculated by using price indexes specific to or closely associated with price movements in series under consideration. The item in question, whether an asset or liability and irrespective of sector, was adjusted by the same specific price index. The second is a general adjustment to account for the change in the purchasing power of the monetary unit. This is obtained by using the implicit deflator for Gross National Expenditure.

As described later, the relationships between end of year price levels of the current and the preceding year were used to adjust end of the year balance sheet outstandings figures. Some might argue that mid-year figures instead of year end data, both for outstandings, i.e. balance sheet series, and for prices would have been more appropriate for these calculations as they would better represent the average experience for the periods. It might be recalled however, that these are balance sheet figures which represent the situation at a point in time and not flows which cumulate through the period. Using mid-year data would serve to distort representation of the actual situation. The concept of comprehensive income, to which these adjustments are tied, is cast with respect to sectoral positions at the beginning and at the end of the period.

3.5. *Considerations re Shares, Term Deposits and Currency Valuation*

It should be noted that no adjustments are made for specific gains or losses on the holdings of shares, or shares as a liability of the enterprise sector to other sectors, or on term deposits as assets and as liabilities. These items can be significant elements in particular sector balance sheets and their values can

fluctuate sharply so that omitting them from items affected by other than general inflationary price changes would seem to call for an explanation.

Shares as asset holdings were not adjusted according to the movement of stock indexes because these shares were recorded at market or close to market price in the balance sheet figures of stock holdings. On this basis these data require no adjustment. A similar reason applies to the liability side since share liabilities are calculated at book value of shareholders equity including retained savings, in other words at the reported net worth of the company.

It might have been noticed that the estimation of capital gains and losses is limited to bonds and mortgages. This ignores the fact that there are financial institutions who typically fund their mortgages with term deposits of equivalent maturity. Thus a large part of capital gains and losses incurred on mortgages extended by these institutions may have been offset by equivalent and offsetting losses and gains on fixed term deposits. This adjustment should have, but has not been made.

As a final point, all data in the balance sheet are values in Canadian currency. Non-Canadian currency transactions such as official international reserves and foreign currency denominated investments had already been converted, where possible, to Canadian equivalents with the use of year-end exchange rates when the basic balance sheet series were compiled. To this extent, therefore, gains and losses arising from movements in exchange were already embodied in the net worth figures, and such gains and losses should have been identified. This was not done, however, so that although the aggregate adjustment series in Table 3F would not change, the aggregates are not split between amounts arising from changes in the exchange value of the currency and other changes.

4. Methodology for Deriving Adjustments to Net Worth

4.1. *General*

Changes in the value of net worth, represented by the total adjustment shown in Tables 3A through 3F, can occur through changes in prices specifically affecting the current value of particular items or through changes in the general price level.

Adjustments to net worth from these can be decomposed into three components:

(i) gains or losses on tangible assets
(ii) gains or losses on fixed-money assets
(iii) general inflationary gains or losses on tangible assets, and financial assets and liabilities.

The formulae used to calculate the adjustments presented in the appendix are explained in the following sections.

4.2. *Gains and Losses on Tangible Assets*

The preliminary balance sheet data show tangible assets at current values, and therefore already include gains due to price changes for such assets. Since an objective of the analysis is to show such gains explicitly, the amount of this gain, $GLTA_t$ was subtracted from the balance sheet data, and added back in

Tables 3A-3F. The calculation of $GLTA_t$ is discussed below. An example of the treatment of this gain, for the personal sector in 1983, is the following.

	(millions of dollars)
Preliminary series (not shown in tables)	943,026
Less gain on tangible assets (Table 3A)	10,376
Unadjusted series (Table 2)	932,650
Gain on tangible assets (Table 3A)	10,376
All other adjustments (Table 3A)	−45,147
Total	−34,771
	932,650
	−34,771
Adjusted series (Table 2)	897,879

With this treatment the unadjusted series rather than the preliminary becomes the base figure for comparison with the adjusted series. It might be noted that all adjustments, including the one for tangible gains, are grouped together in Tables 3A-3F.

The adjustment to tangible assets can be expressed as

$$GLTA_t = TA_t \times ((PTA_t - PTA_{t-1})/PTA_t)$$

where

$GLTA_t$ = Gains or losses on tangible assets for year t
TA_t = Tangible assets at current values for year t
PTA_t = Price index for tangible assets for year t

Specific indexes used for determining approximate gains or losses on tangible assets were as follows:

(i) Residential Structures—GNE residential construction implicit deflator
(ii) Non-residential Structures—GNE non-residential construction implicit deflator
(iii) Machinery and Equipment—GNE machinery and equipment implicit deflator
(iv) Consumer Durables—GNE consumer durables implicit deflator
(v) Inventories—GNE non-farm business inventories deflator
(vi) Land—Consumer Price Index

In addition, tangible assets, like all others, are subject to the general inflationary adjustment described in section 4.4. It might be mentioned, however, that question was raised as to whether the Consumer Price Index was appropriate for reflecting changes in land prices. A number of experts in this area had been consulted and it was upon their recommendation that this index was selected.

4.3. *Gains and Losses on Bonds and Mortgages*

Adjustment for gains or losses on fixed-money denominated instruments were derived by applying appropriate interest yield rates to the book value series.

Long-term bonds for example, were adjusted for gains or losses resulting from changes in interest rates by applying percentage changes in the interest yield rate on long term bonds. It should be noted, however, that non-marketable bonds, such as Canada Saving Bonds and special bonds associated with loans to provincial governments from Canada Pension Plan and Quebec Pension Plan funds were not subjected to the interest yield adjustment. By special arrangement these bonds are not traded in the market and can only be sold back to the issuer at face value. Value figures of mortgages outstanding were adjusted for effect of interest rate changes by the use of five year conventional mortgage interest rate. Although there was considerable shortening of the mortgate period in the 1980's with rises in interest rates, the bulk of mortgages outstanding are assumed to be long term over the series covered.

Theoretically, the formula for adjusting the market prices of debt instruments for changes in interest rates would be as follows:

$$\text{Percent change in market price of bond} = \frac{-1}{1+r} \times \Delta r \times D$$

where: r is the market interest rate, Δr is the change in the rate, and D is the duration of the bond (or mortgage). Duration (D) is the present-value weighted average term to maturity.

This formula is suited for the adjustment of bond prices when the duration characteristics of individual bonds are known.[4] However, each balance sheet category is an aggregate of issues with different maturities. Data on individual issues are not generally available and therefore, the more approximate formula given below is actually used. It is believed that this approximation is reasonable, given the expository nature of the analysis in section 5 and the data distortions caused by differing valuations.

Another factor which is not taken into account, either by the formula $-1/(1+r) \times \Delta r \times D$ or by its approximation is the shift in the term structure of a particular instrument. It is believed that usually such shifts are slow, and therefore have little effect on year-to-year adjustments, and that the size of such shifts is small compared to the imperfections in the data.

The approximation for the adjustment to net worth for gains and losses on fixed-money instruments can be expressed as:

$$GLF_t = CF_t \times ((IN_{t-1} - IN_t)/IN_t)$$

for fixed-money assets (column 2 of Table 3)

$$GLF_t = CF_t \times ((IN_t - IN_{t-1})/IN_t)$$

for fixed-money liabilities (column 3 of Table 3)

where

GLF_t = Gains or losses on fixed-money instruments for year t

CF_t = Reported value for fixed-money instruments at the end of year t

[4]For a fuller discussion on this topic, see "Deep Discount Bonds and Duration", *Financial Flows*, Third Quarter 1981, Statistics Canada, catalogue no. 13-002, pp. XXIV-XXX.

IN_t = Interest rate for fixed-money instruments at the end of year t
IN_{t-1} = Interest rate for fixed-money instruments at the end of year $t-1$

4.4. *General Inflationary Adjustment*

Finally, all series were adjusted by changes in the implicit Gross National Expenditure (GNE) deflator to take into account changes in the general purchasing power of the monetary unit.

The adjustment to net worth for inflation in columns 4, 5 and 6 of Tables 3A through 3F were calculated by the use of the following formulae.

$$A_t = CAF_t \times ((P_{t-1} - P_t)/P_t)$$

for fixed-money assets

$$A_t = C_t \times ((P_{t-1} - P_t)/P_t)$$

for all tangible assets and all other financial assets

$$A_t = CAF_t \times ((P_t - P_{t-1})/P_t)$$

for fixed-money liabilities

$$A_t = C_t \times ((P_t - P_{t-1})/P_t)$$

for all other financial liabilities

where

A_t = Adjustment for inflationary gains or losses for year t
CAF_t = Current value adjusted for gains or losses on fixed money instruments at the end of year t
C_t = Current value at the end of year t
P_t = Price prevailing at the end of year t
P_{t-1} = Price prevailing at the end of year $t-1$.

5. Illustrative Analysis of Data

5.1. *General*

The principal objective in this section is the analysis of figures of real changes in net worth. The analysis utilizes net worth data from the National Balance Sheet Accounts, and therefore allowances should be made for the limitations which were discussed in section 3. These are the provisional nature of the figures, valuation problems, the fact that foreign denominated assets and liabilities are not separately identified, and the exclusion of stocks and term deposits. In addition, the formula used to calculate the gain or loss on bonds is an approximation.

5.2. *Analysis of Changes in New Worth*

The real change in net worth is shown in the second column for each sector, and for national wealth as a whole in Appendix Table 1.

The relationship between Appendix Tables 1 and 2, and 3 is as follows. Taking as an example the situation of the personal sector for the years 1982 and 1983, unadjusted net worth increased from $874.5 to $932.7 billion (Table 2), or

by $58.2 billion. However, on an adjusted basis the net worth of the sector in 1983 is reduced by $34.8 billion to $897.9 billion taking into account net gains on real assets, losses on financial assets and general inflationary gains and losses. The details on these losses, and the total loss for the sector is shown in Table 3A.

Therefore, the real change in net worth shown as $23.4 billion in 1983 in Table 1 can be derived in two ways: first, as the difference between the unadjusted net worth of year $t-1$ and the adjusted net worth of year t respectively, in Table 2; and second, as the subtraction of total sector losses for year t from the unadjusted change in net worth between t and $t-1$. The second approach requires the subtraction of $34.8 billion (total net adjustment—Table 3A) from $58.2 billion (change in unadjusted 1982 to 1983 Table 2), to obtain the real change in net worth of $23.4 billion. In other words losses have reduced the gain in the sector's net worth between 1982 and 1983 from $58.2 to $23.4 billion.

Table 1 shows large gains in (unadjusted) net worth for persons and unincorporated business. However, gains in real net worth are much smaller in most years of the 1961–1983 period, and a loss was sustained in 1982. Non-financial corporations appear to have gained in most years on an unadjusted or nominal basis, but on the whole the sector's real gains seem to be larger, in some years far larger, than unadjusted gains. In the government sector the pattern is similar to that of non-financial corporations with the exception of a few more years when real gains are smaller than nominal gains. The small and fluctuating net worth of banks and near-banks (Table 2) translated into a mixed pattern of unadjusted net worth in Table 1. Adjusted net worth is lower than the unadjusted in 15 years out of 22 for this sector, suggesting fairly consistent inflationary losses. The pattern for other financial institutions is similar. The rest of the world sector shows consistent nominal gains in net worth, but either smaller increases or actual decreases in real net worth changes for most years.

A clearer understanding of the patterns shown in Table 1 requires an examination of the detail and the trends in Tables 3A–3F. The following analysis deals with these and links them in a very rough way to inflation rates in the post-1975 period.

5.3. *Analysis of Gains and Losses by Sector*

The net worth of the personal sector has been consistently eroded by general inflationary losses on financial assets (mainly term deposits) in the past decade. These losses were stemmed to some extent in years when the inflation rate diminished, as for example in 1983. The principal long-term liability of the sector is mortgages. The sector tends to gain on these when inflation is high and rising since it is paying off mortgages contracted earlier at lower rates. The reverse is true when the rate of inflation drops. The personal and non-financial corporate sectors are the major holders of real assets. In both cases general inflationary losses on these assets have exceeded unrealized gains in the post-1970 period.

The non-financial corporate sector balance sheet has benefited from the erosion of the value of its loan and bond liabilities through general inflation.

These translate into overall gains in net worth for most of the post-1970 period (Table 3B). In this period net losses were incurred in 1976 and 1982 when drops in interest rates reversed gains resulting from the erosion of liabilities in other years due to interest rate increases.

In the bank and near-banks sector and the other financial institution sector real assets are small compared to the personal and non-financial corporate sectors, and general inflationary losses on financial assets and liabilities net out to a very small number in most years. Therefore gains and losses, particularly on financial assets, largely determine changes in net worth. For banks and near-banks, mortgages form by far the largest part of the assets subject to adjustment. The trend is the opposite and the size is roughly comparable to the mortgage liabilities in the personal sector. Other financial institutions have substantial mortgage and bond holdings. The overall trend for both sectors appears to be losses in net worth in times of high and rising inflation and gains in periods of lower and falling inflation rates.

Next to non-financial corporations, the other major debtor is government. Comparison of the experience of these two sectors (Tables 3B and 3E) reveals virtually identical trends. The key features are the pattern of gains and losses on bond liabilities depending on inflation rates and the erosion of the real value of the liability on account of inflation leading to positive changes in net worth in most years. As in the case of non-financial corporations, 1976 and 1982 are exceptions, and apparently for the same reasons.

Canada has been a net debtor to the rest of the world in the postwar period. Since this sector is a net supplier of funds to Canada, it is not surprising that Table 3F bears similarities to 3C and 3D. Although the change in net worth is negative (or in Canada's favour) in nearly all years, there is some indication that the sector's loss is higher in years with high and rising inflation rates, for example 1978–1981, in parallel with the trend which was identified for financial institutions.

The foregoing analysis suggests that non-financial corporations and government have consistently benefited from changes in net worth which are related to inflation rates while persons and the foreign sector lost. Financial institutions tend to gain in years with low or falling inflation and lose in other years. It is worthwhile recalling that this analysis does not include possible effects on net worth from changes in the value of stocks or of term deposits. The results do, however, indicate that the size of changes in net worth by sector are affected by its composition and the impact of interest and other rate changes.

Table 4 shows relative sector shares of total net worth before and after adjustment for valuation changes in sector assets and liabilities components of net worth. These percentages are based on data from Table 2.

These percentages show that the persons and unincorporated business sector share of adjusted total net worth is lower than that indicated by the unadjusted data every year from 1962 to 1983, with the largest differences registered from 1971 on. On the other hand, the relative share of nonfinancial corporations increased during the same period. Banks and other financial institutions indicate a mixed experience, although on balance their data too suggest decreases. Governments on the other hand gained with minor exceptions whereas the rest of the world sector shows declines for most years.

6. Conclusion

A number of points emerged in the development of this paper which are summarized below.

(a) The conventional measures of income are incomplete and inadequate for some types of analysis of economic behaviour especially in the presence of significant price changes. A more suitable measure for this purpose is comprehensive income along the lines formulated by Hicks. Comprehensive income consists of consumption in a given period plus the real change in net worth between the beginning and end of that period. Further research is required, however, to ensure that this interpretation is fully consistent with the Hicksian concept.

(b) The paper develops a method for operationalizing the part of the concept pertaining to net worth in order to determine effects of price changes on sectoral net wealth positions in any given year. It uses balance sheet data for Canada for 1961-83 according to a six sector breakout of the economy. The result is an illustrative calculation of changes in real net worth, from which preliminary analysis is provided.

(c) The analysis is considered preliminary on account of a number of statistical shortcomings, i.e. relationship between interest yields and capital gains and losses, estimation of gains and losses on term deposits, valuation problems, and because the meaning of corporate net worth needs further examination and refinement.

(d) Although not specifically discussed in the paper, it might also be mentioned that research associated with the paper raised questions with respect to the current treatment of the inventory valuation adjustment, purchases of land and the capitalization of consumer durables. It is hoped that some attention will be directed to the resolution of these issues in the not too distant future.

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APPENDIX

TABLE 1

COMPARISONS OF CHANGES IN NET WORTH BY MAJOR SECTORS
(Millions of Dollars)

	Persons and Unincorporated Business		Corporations Including Government Enterprises											
			Non-Financial		Banks and Near Banks		Other Financial		Government		Rest of the World		Total	
Years	Unadj.[1]	Real[2]	Unadj.	Real	Unadj.	Real	Unadj.	Real	Unadj.	Real	Unadj.	Real	Unadj.	Real
1962	3,839	1,617	−1,656	−256	−43	−411	−253	−1,102	−1,375	82	1,026	250	1,538	180
1963	6,472	5,115	381	2,542	−26	−174	62	−258	911	1,943	952	398	8,752	9.566
1964	7,020	4,954	2,643	3,985	2	12	28	55	1,830	1,988	740	149	12,263	11,143
1965	9,278	7,903	1,907	6,470	37	−795	−55	−1,735	2,861	6,084	2,237	794	16,265	18,721
1966	12,565	12,656	2,627	7,057	65	−635	27	−1,348	4,164	6,319	1,825	646	21,273	24,695
1967	13,242	9,985	4,701	7,439	95	−1,129	189	−2,300	2,910	5,692	1,796	−365	22,933	19,322
1968	10,862	8,008	−192	2,967	−8	−1,058	367	−1,653	2,680	4,745	1,743	19	15,452	13,028
1969	10,024	6,191	158	7,524	−167	−2,092	46	−3,614	4,728	8,577	2,046	−1,009	16,835	15,577
1970	13,531	10,756	5,601	1,750	197	3,281	−9	6,194	4,955	−3,094	635	3,104	24,910	21,991
1971	16,486	13,549	5,561	7,596	−10	2,279	127	3,656	6,517	5,524	1,689	1,893	30,370	34,479
1972	21,166	15,574	6,597	15,079	55	−1,057	175	−2,175	4,308	8,581	2,578	−684	34,879	35,318
1973	28,102	19,945	5,029	17,512	95	−2,124	−6	−3,280	8,035	10,390	2,661	−2,514	43,916	39,929
1974	44,725	35,676	4,662	29,079	55	−3,335	226	−2,595	12,246	14,499	4,326	−1,316	66,240	72,008
1975	55,972	38,673	33,418	53,176	206	−1,002	552	−3,042	−11,429	17,568	8,309	415	109,886	105,778
1976	47,865	34,001	32,706	30,057	3,535	6,486	1,076	6,417	14,362	6,117	10,731	9,608	110,275	92,686
1977	68,227	57,541	−1,368	18,528	−3,295	244	−804	559	4,971	9,199	7,159	1,582	74,890	87,653
1978	53,896	52,481	17,807	51,222	54	−6,762	471	−8,271	1,669	12,905	17,079	5,314	90,976	106,889
1979	111,181	79,422	−7,678	28,319	417	−9,578	−287	−10,452	6,996	15,760	10,052	−6,477	120,681	96,994
1980	80,064	59,650	15,432	61,338	209	−9,245	162	−9,359	8,177	20,566	8,451	−7,508	112,495	115,442
1981	85,096	52,410	34,745	88,754	655	−9,270	491	−13,163	15,480	34,760	23,406	−98	159,873	153,393
1982	70,468	−7,927	64,137	41,825	−1,133	20,472	97	34,396	11,161	−18,942	4,739	21,237	149,469	91,061
1983	58,188	23,417	78,617	90,309	2,669	14,994	−267	4,072	4,202	12,586	9,700	3,170	153,109	148,548

[1]Year-to-year change in unadjusted net worth shown in Table 2.
[2]Derived from table 2 as differences between unadjusted net worth of year $t-1$ and adjusted net worth of year t (see also section 5).

TABLE 2

NET WORTH BY SECTOR BEFORE AND AFTER ADJUSTMENT

(Millions of Dollars)

Years	Persons and Unincorporated Business		Corporations Including Government Enterprises						Government		Rest of the World		Total	
			Non-Financial		Banks and Near Banks		Other Financial							
	Unadj.	Adj.[1]	Unadj.	Adj.	Unadj.	Adj.	Unadj.	Adj.	Unadj.	Adj.	Unadj.	Adj.	Unadj.	Adj.
1961	104,381	104,109	15,998	14,621	−62	435	−85	963	11,521	9,563	17,006	17,330	148,759	147,021
1962	108,220	105,998	14,342	15,742	−105	−473	−338	−1,187	10,146	11,603	18,032	17,256	150,297	148,939
1963	114,692	113,335	14,723	16,884	−131	279	−276	−596	11,057	12,089	18,984	18,430	159,049	159,863
1964	121,712	119,646	17,366	18,708	−129	119	−248	−221	12,887	13,045	19,724	19,133	171,312	170,192
1965	130,990	129,615	19,273	23,836	−92	−924	−303	−1,983	15,748	18,971	21,961	20,518	187,577	190,033
1966	143,555	143,646	21,900	26,330	−27	−727	−276	−1,651	19,912	22,067	23,786	22,607	208,850	212,272
1967	156,797	153,540	26,601	29,339	68	−1,156	−87	−2,576	22,822	25,604	25,582	23,421	231,783	228,172
1968	167,659	164,805	26,409	29,568	60	−990	280	−1,740	25,502	27,567	27,325	25,601	247,235	244,811
1969	177,683	173,850	26,567	33,933	−107	−2,032	326	−3,334	30,230	34,079	29,371	26,316	264,070	262,812
1970	191,214	188,439	32,168	28,317	90	3,174	317	6,520	35,185	27,136	30,006	32,475	288,980	286,061
1971	207,700	204,763	37,729	39,764	80	2,369	444	3,973	41,702	40,709	31,695	31,899	319,350	323,477
1972	228,866	223,274	44,326	52,808	135	−977	619	−1,731	46,010	50,283	34,273	31,011	354,229	354,668
1973	256,968	248,811	49,355	61,838	230	−1,989	613	−2,661	54,045	56,400	36,934	31,759	398,145	394,158
1974	301,693	292,644	54,017	78,434	285	−3,105	839	−1,982	66,291	68,544	41,260	35,618	464,385	470,153
1975	357,665	340,366	87,435	107,193	491	−717	1,391	−2,203	77,720	83,859	49,569	41,675	574,271	570,173
1976	405,530	391,666	120,141	117,492	4,026	6,977	2,467	7,807	92,082	83,837	60,300	59,177	684,546	666,956
1977	473,757	463,071	118,773	138,669	731	4,270	1,663	3,026	97,053	101,281	67,459	61,882	759,436	772,199
1978	527,653	526,238	136,580	169,995	785	−6,031	2,134	−6,608	98,722	109,958	84,538	72,773	850,412	866,325
1979	638,834	607,075	128,902	164,899	1,202	−8,793	1,847	−8,318	105,718	114,482	94,590	78,061	971,093	947,406
1980	718,896	698,484	144,334	190,240	1,411	−8,043	2,009	−7,512	113,895	126,284	103,041	87,082	1,083,588	1,086,535
1981	803,994	771,308	179,079	233,088	2,066	−7,859	2,500	−11,154	129,375	148,655	126,447	102,943	1,243,461	1,236,981
1982	874,462	796,067	243,216	220,904	933	22,538	2,597	36,896	140,536	110,433	131,186	147,684	1,392,930	1,334,522
1983	932,650	897,879	321,833	333,525	3,602	15,927	2,330	6,669	144,738	153,122	140,886	134,356	1,546,039	1,541,478

[1]The adjusted columns in this table represent the sum of unadjusted net worth and the total adjustment (Tables 3A through 3F respectively). The columns should not be taken as a continuous time series because of moving rebasing, i.e. each year has been adjusted by price changes.

COMPOSITION OF ADJUSTMENT BY SECTORS

TABLE 3A

PERSONS AND UNINCORPORATED BUSINESS

(Millions of Dollars)

	Gains and Losses[1]			General Inflationary Gains and Losses			
		Long-Term Bonds and Mortgages					
	Tangible Assets	Assets	Liabilities	Tangible Assets	Financial Assets	Liabilities	Total
1961	−26	806	—	−610	−618	176	−272
1962	617	−677	—	−1,261	−1,297	396	−2,222
1963	1,210	−255	1	−1,347	−1,405	439	−1,357
1964	1,634	—	—	−2,157	−2,297	754	−2,066
1965	3,004	−1,109	738	−2,387	−2,459	838	−1,375
1966	4,188	−779	1,125	−2,638	−2,695	890	91
1967	3,328	−1,504	1,318	−3,842	−3,911	1,354	−3,257
1968	2,092	−1,108	1,259	−3,065	−3,216	1,184	−2,854
1969	4,313	−2,010	3,014	−5,526	−5,713	2,089	−3,833
1970	3,749	4,215	−821	−5,939	−6,437	2,458	−2,775
1971	5,116	1,693	−3,413	−3,897	−4,176	1,740	−2,937
1972	7,269	−1,477	366	−7,359	−7,464	3,073	−5,592
1973	18,220	−1,902	3,170	−17,617	−16,964	6,936	−8,157
1974	28,632	−1,237	7,284	−28,020	−25,520	9,812	−9,049
1975	22,667	−2,223	76	−25,141	−22,565	9,887	−17,299
1976	22,196	2,051	−4,052	−23,284	−20,642	9,867	−13,864
1977	25,626	144	−6,868	−19,782	−18,375	8,599	−10,686
1978	26,012	−2,845	9,007	−21,988	−20,585	8,984	−1,415
1979	31,804	−3,155	14,623	−46,592	−45,596	17,157	−31,759
1980	46,297	−2,971	13,869	−47,827	−47,100	17,318	−20,414
1981	43,673	−4,759	14,101	−53,045	−52,162	19,506	−32,686
1982	20,780	8,684	−29,127	−48,926	−51,444	21,638	−78,395
1983	10,376	1,036	−18,413	−16,892	−18,281	7,404	−34,771

[1]These gains and losses are calculated using specific indexes.

TABLE 3B

NON-FINANCIAL CORPORATIONS

(Millions of Dollars)

	Gains and Losses[1]			General Inflationary Gains and Losses			
		Long-Term Bonds and Mortgages					
	Tangible Assets	Assets	Liabilities	Tangible Assets	Financial Assets	Liabilities	Total
1961	−117	140	−1,254	638	−201	693	−1,377
1962	789	−117	1,052	−1,316	−440	1,432	1,400
1963	2,130	−49	416	−1,404	−463	1,531	2,161
1964	1,920	—	—	−2,280	−777	2,479	1,342
1965	3,614	−249	1,936	−2,542	−857	2,661	4,563
1966	4,058	−163	1,349	−2,848	−940	2,974	4,430
1967	1,453	−293	2,801	−4,101	−1,336	4,214	2,738
1968	2,155	−197	2,115	−3,261	−1,084	3,431	3,159
1969	5,698	−363	3,817	−6,012	−1,931	6,157	7,366
1970	5,690	544	−8,594	−6,590	−2,144	7,243	−3,851
1971	6,274	268	−3,277	−4,389	−1,410	4,569	2,035
1972	8,198	−228	3,292	−8,133	−2,571	7,924	8,482
1973	15,668	−282	3,968	−18,885	−5,896	17,910	12,483
1974	34,111	−349	2,376	−30,322	−9,136	27,737	24,417
1975	26,070	−189	5,787	−27,530	−7,653	23,273	19,758
1976	13,798	285	−6,515	−25,124	−6,724	21,631	−2,649
1977	27,607	195	946	−21,444	−6,070	18,662	19,896
1978	34,251	−546	10,561	−24,366	−7,228	20,743	33,415
1979	45,297	−660	11,739	−52,008	−16,396	48,025	35,997
1980	56,983	−596	10,656	−53,992	−17,246	50,101	45,906
1981	63,718	−813	17,004	−62,567	−20,001	56,668	54,009
1982	38,050	1,725	−40,238	−61,508	−19,469	59,128	−22,312
1983	22,634	669	−1,296	−22,720	−6,777	19,182	11,692

[1]These gains and losses are calculated using specific indexes.

TABLE 3C

BANKS AND NEAR BANKS

(Millions of Dollars)

	Gains and Losses[1]			General Inflationary Gains and Losses			
		Long-Term Bonds and Mortgages					
	Tangible Assets	Assets	Liabilities	Tangible Assets	Financial Assets	Liabilities	Total
1961	−2	503	—	−3	−190	189	497
1962	2	−380	—	−6	−385	401	−368
1963	8	−161	—	−7	−499	511	−148
1964	6	—	—	−11	−841	856	10
1965	22	−883	—	−13	−920	962	−832
1966	22	−749	—	−15	−990	1,032	−700
1967	16	−1,298	5	−23	−1,479	1,555	−1,224
1968	13	−1,097	4	−19	−1,274	1,323	−1,050
1969	39	−2,078	7	−36	−2,347	2,490	−1,925
1970	42	3,224	−14	−40	−2,900	2,772	3,084
1971	43	2,336	−17	−27	−1,944	1,898	2,289
1972	58	−1,330	109	−52	−3,569	3,672	−1,112
1973	97	−2,670	132	−126	−8,713	9,061	−2,219
1974	231	−4,101	14	−209	−13,336	14,011	−3,390
1975	191	−1,754	277	−196	−11,977	12,251	−1,208
1976	80	3,758	−280	−187	−11,928	11,508	2,951
1977	176	3,532	104	−163	−10,494	10,384	3,539
1978	233	−7,844	409	−191	−12,134	12,711	−6,816
1979	376	−11,925	466	−426	−25,972	27,486	−9,995
1980	492	−11,286	446	−460	−28,227	29,581	−9,454
1981	615	−123,347	933	−567	−32,322	33,763	−9,925
1982	405	25,877	−24,480	−583	−33,932	32,286	21,605
1983	282	12,383	155	−221	−11,241	10,967	12,325

[1]These gains and losses are calculated using specific indexes.

TABLE 3D

OTHER FINANCIAL INSTITUTIONS

(Millions of Dollars)

	Gains and Losses[1]			General Inflationary Gains and Losses			
		Long-Term Bonds and Mortgages					
	Tangible Assets	Assets	Liabilities	Tangible Assets	Financial Assets	Liabilities	Total
1961	−4	1,141	−79	−7	−256	253	1,048
1962	7	−947	69	−13	−514	549	−849
1963	17	−377	29	−15	−579	605	−320
1964	22	—	—	−25	−975	1,005	27
1965	52	−1,953	163	−29	−1,036	1,123	−1,680
1966	64	−1,592	106	−34	−1,166	1,247	−1,375
1967	43	−2,874	235	−51	−1,668	1,826	−2,489
1968	26	−2,252	152	−41	−1,416	1,511	−2,020
1969	74	−4,169	261	−78	−2,506	2,758	−3,660
1970	75	7,197	−734	−87	−3,257	3,009	6,203
1971	101	3,741	−190	−59	−2,019	1,955	3,529
1972	144	−2,926	341	−118	−3,531	3,741	−2,350
1973	343	−4,288	375	−300	−7,926	8,522	−3,274
1974	550	−3,719	51	−500	−11,749	12,546	−2,821
1975	477	−5,041	724	−466	−10,518	11,230	−3,594
1976	393	6,455	−830	−444	−10,738	10,504	5,340
1977	504	690	363	−388	−8,784	8,978	1,363
1978	541	−11,074	1,369	−444	−9,311	10,177	−8,742
1979	695	−13,306	1,415	−938	−19,655	21,624	−10,165
1980	1,008	−12,786	1,423	−970	−20,524	22,328	−9,521
1981	1,009	−18,550	2,648	−1,111	−22,367	24,717	−13,654
1982	520	43,330	−5,900	−1,082	−27,167	24,598	34,299
1983	295	3,887	363	−395	−8,713	8,902	4,339

[1]These gains and losses are calculated using specific indexes.

COMPOSITION OF ADJUSTMENT BY SECTORS (CONCLUDED)

TABLE 3E

GOVERNMENT

(Millions of Dollars)

	Gains and Losses[1]			General Inflationary Gains and Losses			
		Long-Term Bonds and Mortgages					
	Tangible Assets	Assets	Liabilities	Tangible Assets	Financial Assets	Liabilities	Total
1961	−105	253	−2,009	−227	−212	342	−1,958
1962	269	−213	1,638	−443	−447	653	1,457
1963	703	−80	655	−489	−474	717	1,032
1964	561	—	—	−790	−767	1,154	158
1965	1,642	−399	2,566	−905	−808	1,127	3,223
1966	1,655	−324	1,506	−1,030	−884	1,232	2,155
1967	1,054	−802	3,597	−1,490	−1,293	1,716	2,782
1968	862	−704	2,760	−1,185	−1,111	1,443	2,065
1969	2,447	−1,372	4,567	−2,181	−2,059	2,447	3,849
1970	2,575	3,394	−12,590	−2,401	−2,650	3,623	−8,049
1971	2,596	1,095	−3,426	−1,632	−1,722	2,096	−993
1972	3,439	−1,401	4,882	−3,005	−3,010	3,368	4,273
1973	5,479	−1,565	4,707	−6,867	−6,459	7,060	2,355
1974	12,493	−494	496	−11,201	−10,084	11,043	2,253
1975	9,849	−2,871	8,478	−10,020	−8,020	8,723	6,139
1976	3,938	2,902	−7,796	−8,957	−7,443	9,111	−8,245
1977	8,140	−966	3,519	−7,512	−5,971	7,018	4,228
1978	10,184	−4,624	12,695	−8,309	−6,688	7,978	11,236
1979	15,231	−4,735	12,417	−17,130	−13,017	15,998	8,764
1980	18,891	−4,620	12,149	−17,478	−13,591	17,038	12,389
1981	21,949	−8,470	22,319	−20,153	−15,171	18,806	19,280
1982	13,827	421,150	−54,157	−19,887	−17,560	26,524	−30,103
1983	9,531	−1,096	4,685	−7,446	−5,607	8,317	8,384

[1]These gains and losses are calculated using specific indexes.

TABLE 3F

REST OF THE WORLD

(Millions of Dollars)

	Gains and Losses[1]			General Inflationary Gains and Losses			
		Long-Term Bonds and Mortgages					
	Tangible Assets	Assets	Liabilities	Tangible Assets	Financial Assets	Liabilities	Total
1961	—	499	—	—	−267	92	324
1962	—	−425	—	—	−549	198	−776
1963	—	−178	—	—	−626	250	−554
1964	—	—	—	—	−1,019	428	−591
1965	—	−809	—	—	−1,063	429	−1,443
1966	—	−479	—	—	−1,152	452	−1,179
1967	—	−1,184	—	—	−1,627	650	−2,161
1968	—	−932	—	—	−1,344	552	−1,724
1969	—	−1,671	—	—	−2,506	1,122	−3,055
1970	—	4,179	—	—	−2,997	1,287	2,469
1971	—	1,190	—	—	−1,814	828	204
1972	—	−1,629	—	—	−3,161	1,528	−3,262
1973	—	−1,646	—	—	−7,184	3,655	−5,175
1974	—	−319	—	—	−10,400	5,077	−5,642
1975	—	−3,264	—	—	−8,791	4,161	−7,894
1976	—	4,023	—	—	−8,923	3,777	−1,123
1977	—	−1,629	—	—	−7,179	3,231	−5,577
1978	—	−7,120	—	—	−8,635	3,990	−11,765
1979	—	−6,884	3	—	−18,131	8,483	−16,529
1980	—	−6,288	4	—	−19,634	9,959	−15,959
1981	—	−12,067	—	—	−23,257	11,820	−23,504
1982	—	31,104	—	—	−26,275	11,669	16,498
1983	—	−2,375	—	—	−8,349	4,194	−6,530

[1]These gains and losses are calculated using specific indexes.

TABLE 4

PERCENTAGE SHARE OF UNADJUSTED AND ADJUSTED TOTAL NET WORTH BY SECTOR

Years	Persons and Unincorporated Business		Corporations Including Government Enterprises						Government		Rest of the World		Total	
			Non-Financial		Banks and Near Banks		Other Financial							
	Unadj.	Adj.	Unadj.	Adj.	Unadj.	Adj.	Unadj.	Adj.	Unadj.	Adj.	Unadj.	Adj.	Unadj.	Adj.
1961	70.2	70.7	10.8	9.9	−0.0	0.5	−0.1	0.7	7.7	6.5	11.4	11.7	100.0	100.0
1962	72.0	71.1	9.5	10.6	−0.1	−0.3	−0.2	−0.8	6.8	7.8	12.0	11.6	100.0	100.0
1963	72.1	70.9	9.3	10.6	−0.1	−0.2	−0.2	−0.4	7.0	7.6	11.9	11.5	100.0	100.0
1964	71.1	70.3	10.1	11.0	−0.1	−0.1	−0.1	−0.1	7.5	7.7	11.5	11.2	100.0	100.0
1965	69.8	68.2	10.3	12.5	−0.0	−0.5	−0.2	−1.0	8.4	10.0	11.7	10.8	100.0	100.0
1966	68.7	67.6	10.5	12.4	−0.0	−0.3	−0.1	−0.8	9.5	10.4	11.4	10.7	100.0	100.0
1967	67.7	67.2	11.5	12.9	0.0	−0.5	−0.0	−1.1	9.8	11.2	11.0	10.3	100.0	100.0
1968	67.9	67.2	10.7	12.1	0.0	−0.4	0.1	−0.7	10.3	11.3	11.0	10.5	100.0	100.0
1969	67.3	66.2	10.1	12.9	−0.0	−0.8	0.1	−1.3	11.4	13.0	11.1	10.0	100.0	100.0
1970	66.2	65.8	11.1	9.9	0.0	1.1	0.1	2.3	12.2	9.5	10.4	11.4	100.0	100.0
1971	65.1	63.3	11.8	12.3	0.0	0.7	0.1	1.2	13.1	12.6	9.9	9.9	100.0	100.0
1972	64.6	63.0	12.5	14.9	0.0	−0.3	0.2	−0.5	13.0	14.2	9.7	8.7	100.0	100.0
1973	64.5	63.1	12.4	15.7	0.1	−0.5	0.1	−0.7	13.6	14.3	9.3	8.1	100.0	100.0
1974	64.9	62.2	11.6	16.7	0.1	−0.7	0.2	−0.4	14.3	14.6	8.9	7.6	100.0	100.0
1975	62.4	59.7	15.2	18.8	0.1	−0.1	0.2	−0.4	13.5	14.7	8.6	7.3	100.0	100.0
1976	59.1	58.7	17.6	17.6	0.6	1.0	0.4	1.2	13.5	12.6	8.8	8.9	100.0	100.0
1977	62.4	59.9	15.6	18.0	0.1	0.6	0.2	0.4	12.8	13.1	8.9	8.0	100.0	100.0
1978	62.0	60.8	16.1	19.6	0.1	−0.7	0.3	−0.8	11.6	12.7	9.9	8.4	100.0	100.0
1979	65.8	64.1	13.3	17.4	0.1	−0.9	0.2	−0.9	10.9	12.1	9.7	8.2	100.0	100.0
1980	66.4	64.3	13.3	17.5	0.1	−0.7	0.2	−0.7	10.5	11.6	9.5	8.0	100.0	100.0
1981	64.6	62.4	14.4	18.8	0.2	−0.6	0.2	−0.9	10.4	12.0	10.2	8.3	100.0	100.0
1982	62.7	59.5	17.5	16.6	0.1	1.7	0.2	2.8	10.1	8.3	9.4	11.1	100.0	100.0
1983	60.3	58.4	20.8	21.6	0.2	1.0	0.2	0.4	9.4	9.9	9.1	8.7	100.0	100.0