sity for accommodating to the informal organization of workers in the early twentieth century (the sort of thing which has been popularized by Elton Mayo and others in the field of human relations). The development of formal counter organizations consciously aimed at wresting away a part of management's control of decision making necessitated a completely different process of accommodation and has been the subject of a vast amount of recent literature.[17]

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FIVE DECADES OF UNITED STATES SAVING*

This massive work on saving by Raymond Goldsmith merits the economium "definitive," that no important qualifications can blur. It should be emphasized that this opinion is not based primarily on bulk, although on that score some admiration is due since the first volume alone contains over 850 pages of tables. With evident skill Goldsmith has assembled information from hundreds of diverse sources, and in addition he has created some new series, welding these into the distinctly best estimates of savings yet to appear. The first two volumes set out the conceptual framework and detail the specific problems that arose in the process of compiling the actual estimates. Volume I also contains major analytical conclusions based on the study. Detailed information about a national balance sheet and annual national income estimates for the years 1897–1949 were by-products of the saving estimates, and these are included in Volume III. Along with these additional statistics appear wealth estimates of the upper income brackets by Horst Mendershausen and analytical studies of saving behavior by Raymond Goldsmith and Dorothy Brady. The one by Goldsmith exploits some aspects of the time series developed in the first two volumes, while Dorothy Brady offers a sophisticated study of consumer expenditures based upon a comparatively novel interpretation of numerous previously collected budget studies.[1]

Saving, defined as the change in net worth for an individual or some particular economic group, can be measured either from the income state-

[17] While the literature on the early history of management policies towards labor is sparse indeed, there has been a voluminous amount of work in the past several decades. See for example, Clinton Golden and Virginia Parker (editors), *Causes of Industrial Peace* (New York: Harper & Bros., 1949), or the Twentieth Century Fund Study, *How Collective Bargaining Works* (New York: Twentieth Century Fund, 1942).

* *A Study of Saving in the United States,* by Raymond W. Goldsmith, Princeton, N. J.: Princeton University Press, 1955, Vol. I, Introduction: Tables of Annual Estimates of Saving, 1897–1949, pp. xxx, 1138, Vol. II, Nature and Derivation of Annual Estimates of Saving, 1897–1949, pp. xxiv, 632, $30 for two volumes. Vol. III, *Special Studies,* by Raymond W. Goldsmith, Dorothy S. Brady, and Horst Mendershausen, Princeton, N. J.: Princeton University Press, 1956, pp. xix, 476, $8.50.

[1] During the past six or seven years Franco Modigliani, Richard Brumberg, Margaret Reid, and Milton Friedman worked on similar hypotheses about income-expenditure relationships.

ment as the difference between revenue and outlay or from two balance sheets as the sum of changes in assets less changes in liabilities. When consistent accounting procedures have been employed, these estimates will, by definition, be equal. Goldsmith has, so far as data permit, based his estimates on changes in balance sheet items rather than on the uniform money total most familiar to economists from the Department of Commerce National Income accounts. Hence many of the variegated forms that savings can take are recorded.

As an example, personal savings is recorded in each of twenty-eight forms. These include residential and non-residential real estate, consumers and producers durables, farm lands, currency, commercial and saving bank deposits, postal saving, credit unions, saving and loan associations, mortgage holdings, life insurance (two types), pension and retirement funds (three types), securities (four types: United States, state and local, corporate and foreign bonds, and stocks), borrowing on securities, consumer debt, residential real estate debt, and real estate debt of non-profit institutions. Many of these series in turn depend upon numerous others. This detail indicates the scope of information made available.

The statistical information has been aggregated in many different ways. First, it has been grouped according to the types of savers, that for most purposes are entered into the following seven classes:

1. Non-agricultural households
2. Agricultural households
3. Unincorporated business
4. Corporations
5. State Governments
6. Local Governments
7. Federal Government

Seven different combinations of these classes were selected for further analysis. These run from the all inclusive category of national saving, down to the least inclusive—individuals' saving and business saving. Other categories are non-federal saving, private saving, collective (that is government) saving, and personal saving. The reviewer's immediate reaction was that seven saving groups was an excessive number. However, the decision made here, as in each of a number of other situations, was to tabulate a large number of variants so that others using the data could make their own choice. The selection of these particular categories in an uncomfortable number of instances was dictated by the availability of data in certain forms. Thus, the categories "Unincorporated business" and, to a slightly lesser extent, "Corporations" encompass a glorious hodgepodge of different economic factors.

A second problem of scope relates to "optional" adjustments to the saving data. One obvious step is to measure saving in real terms, real in the sense that changes in the general level of prices do not distort comparisons among the different years. Since no uniquely best deflator exists, Goldsmith presents three alternative forms of real savings, as deflated by a Gross National Product price index, a wage index, and price indexes appropriate to expenditures of the different saving sectors. The wage index seems needlessly disinterred from Keynes's *General Theory*.

Most annual savings estimates for the years 1897–1949 have been grouped into thirteen quadrennial periods, and alternatively "economic" periods selected to include "an integral number . . . of business cycles." It is quite largely on inter-period comparisons that Goldsmith bases his generalizations about long-term trends in saving. His main conclusions from perusal of the data are:

(1) The annual rate of growth in unadjusted national saving for the period 1897–1929 was about seven per cent. Goldsmith found about half of this increase was due to price inflation. When price-deflated saving is expressed in per capita figures, savings increased about 1.8 per cent per year. It is this last figure which best expresses the "real" increase per year in saving.[2]

Comparisons of national price-deflated saving rates for the period 1897 to 1949 with the scantier data available for the preceding several decades permit the inference that the trend in saving has been slowly declining. However, on a per capita basis, the change in trend is much less noticeable, so that Goldsmith suggests that changes in population rates of increase are responsible for the change in saving trend.

Personal saving per capita trends are noticeably affected by the exclusion of consumer durables from the definition of personal saving. If this category is excluded, the rate of increase for the last half of the period surveyed is distinctly less than that for the first half. If consumer durables are included, little change between these periods can be observed.

(2) Cycles of about 20 to 30 years duration in personal saving are discernible when the data are graphed as nine-year moving averages. We can look forward to an analytical treatment of these fluctuations in a future volume by Simon Kuznets, to be entitled *Capital Formation and Financing in the United States, Trends and Prospects.*

(3) Apart from sharp cyclical variations and war experience, the saving-income ratio has been quite stable. This is true for national saving as well as personal saving and saving of non-farm individuals. In the case of the latter two measures, however, the exclusion of consumer durables from savings ratios results in a moderately lower figure for the period after the Second World War than those for the twenties and earlier. Goldsmith

[2] These conclusions were obtained through least-squares curve fitting.

cautions, however, that "this hypothesis is tentative. It may be upset insofar as it deals with secular trend by the experience of the 1950's. It may also have to be modified by revisions in the estimates for earlier years, particularly for the period before World War I" (Vol. I, p. 75).

(4) No marked secular trend can be seen in the distribution of saving among the seven major saving groups. This finding must be qualified, as are several others, by the nature of savings definitions used. If personal savings includes consumer durable goods, and also if savings accumulating in government pension and retirement funds are attributed to government rather than the private sector, the results are radically changed. Under this set of definitions, personal savings stood at 47 per cent of national saving in 1946 to 1949 and the government's share at 28 per cent. At the beginning of the survey, for the years 1897 to 1908, the corresponding figures were 69 per cent and 7 per cent.

(5) Among the most revealing findings of these volumes are those concerning historical changes in the relative importance of different forms of personal saving. From the beginning of this century through 1929, corporate securities accounted for about one third of annual personal saving. In 1946 to 1949, the figure stood at about 5 per cent. Another "structural" break occurred in bank deposits which until 1914 accounted for 25 per cent of saving but which were half that amount in the succeeding "normal" periods, 1922 to 1929 and 1946 to 1949. Residential real estate also has shown a sharp relative decline as a form of net personal saving.

Of all forms of savings, pension and retirement funds showed the most dramatic increases. These funds were virtually unknown at the beginning of the period covered by this survey and were of minute significance in the years 1922 to 1929, yet comprised 20 per cent of net saving in the period after the Second World War. If we combine these funds with additions to life insurance reserves, direct individual security provisions absorbed slightly over one third of 1946 to 1949 saving. Life insurance has become a steadily rising share of saving, perhaps reflecting the rapidly increasing life expectancy of the average individual, as well as redistributions of income. Consumer durables absorbed about 10 per cent of saving before the First World War, increased to 15 per cent in the 1922 to 1929 period and, during the years after the Second World War rose to about 25 per cent.

(6) There has been a steady trend toward the relatively more illiquid forms of saving. If we dichotomize saving into cash plus all securities versus all other forms (mainly, pensions and other "tied" forms of saving, consumer durables, and real estate), the liquid component gradually declined from about 60 per cent of total personal saving in 1897–1908 to about 30 per cent in 1946–1949. Closely related is the fact that in comparison with previous "normal periods"—those covered in the study, but excluding war

years and the Great Depression—the relative share of personal saving obtained by financial intermediaries in 1946–1949 rose sharply, from 35 per cent to 55 per cent. Increases in saving through this medium were mainly at the expense of securities issued by borrowers, so that the remaining category, "for self-use," showed little change.

How accurate are the savings figures? Goldsmith states that "any estimate of personal saving that is limited to data now available is not likely to come closer to the 'true' value than (taking the average over a fairly long number of years) about 20 per cent" (Vol. II, p. 222).

This informed judgment about the average error should not be too discouraging. Rough orders of magnitude often suffice. Furthermore, the thought and effort that went into these estimates make them at least as good, and probably better, than previous estimates. While more accurate data are a major need in all the social sciences, it is doubtful if errors in these estimates invalidate their use for many purposes. Users of these data should be warned, however, that the accuracy differs largely from one series to another, so that each application demands careful prior scrutiny. The sources of error are manifold, although the most important sources can be isolated. There is insufficient information about correct depreciation rates, and woefully inadequate data about certain groups, especially the unincorporated business sector. The further back in time the study goes, the less complete are the original statistics. Goldsmith has been meticulous in evaluating errors and, where possible, has made comparisons with previous saving estimates.[3] This is a most valuable aspect of the study.

The usefulness of the estimates hinges upon the choice of one or more appropriate definitions. These raise a number of difficult conceptual problems that Goldsmith has attacked with astonishing perseverance. While one can occasionally disagree with a conclusion, it is almost impossible to find that he neglected alternative viewpoints before taking a position. To those reared in the belief that savings is the simple difference between income and consumption, these volumes promise a valuable addition to their education.

The basic social accounting definition of national saving favored by Goldsmith has the following content: It is the change in net worth of all non-military assets with an expected service life greater than a year from which revaluation changes have been excluded and from which straight-line depreciation based on replacement cost have been deducted.

[3] The reviewer believes that Goldsmith places unwarranted faith in the reduction of errors because the total estimate of saving has been derived from "a combination of essentially independent component" (Vol. II, p. 140). The fact that the series were estimated independently does not imply that the errors are random and independent in the strict statistical sense. Fallacious estimating techniques could well have been learned in common by the independent compilers of the series.

A less acceptable variant, but one for which figures have been developed, has been called the business accounting definition. In this case, depreciation has been computed at original cost, inventory revaluations are not explicitly taken into account, and depletion is counted as a charge against income. The final possibility considered is the cash flow concept which differs from the other variants by not considering depreciation or other accruals, that is, it is a type of gross saving.

At this point it is appropriate to ask: which is the best concept of saving, both with regard to the analytical content of saving and the group of savers selected? The obvious answer is that the purposes to which the data are to be put will determine the appropriate set of definitions. For many purposes the national saving measure, which includes consumers, business, and government, will prove much too inclusive; disparate motivations of the several groups make this measure an incoherent mass for the analysis of behavior. Yet, if the object instead was to make international or, in numerous circumstances, intertemporal comparisons of savings, this agglomerated measure would avoid distortions originating from differences in the relative importance of the private and public sectors. To study economic development, it is surely correct to concentrate on the crucially important behavior of the private sector, yet a correct over-all view clearly demands that recognition be given the public sector's saving, mostly in the form of roads, bridges, some public utilities, and schools. Thus for many purposes a form of national saving should be the type of saving examined. Equally clear, those who are interested in consumers' behavior or in obtaining statistical estimates of consumption functions should utilize more homogeneous and relevant economic groups.

Goldsmith's definition of social accounting saving has behind it all the logic of modern accounting theory as well as much economic theory, yet this "logic" could be misleading if applied indiscriminately. In particular, the question arises as to whether saving always should be measured net of depreciation. Clearly, if we wish an instantaneous view of how rapidly the net capital stock is growing and can potentially grow, a net aggregate figure of saving (which is defined equal to investment) is desirable. By subtracting an estimate of depreciation we avoid counting the contribution to output of durable assets and their savings counterpart twice.

However, if our interest is less narrowly confined than that pictured above, it might perhaps be more satisfactory to look at gross instead of net saving. Of the two major potential causes of asset value erosion, physical wear and tear on the one hand and obsolescence on the other, it will ordinarily be the latter that predominates. Indeed, the physical aspects of depreciation are likely to reflect, to some extent at least, the economic influence of obsolescence, since there is no advantage to great sturdiness when it is known that the equipment will be junked after a short time. Should this be the case, a low net saving rate could be an indication of two quite different patterns. One, of course, is that saving and capital accumulation are lagging. The other, and not so immediately obvious, possibility is that a particular economy has experienced rapid technological progress so that new production methods are constantly replacing older techniques. Objectively similar items of capital equipment can have different economic lives depending upon differences in the technological progress and innovating pace of the country where they are located. Hence, the causes of depreciation and the relation between depreciation and gross saving must be observed if we are to determine the economic influence of low secular net saving rates. The savings counterpart of rapid technological advance will be large gross saving that contains an unusually large depreciation component.[4]

Some of Goldsmith's major findings listed earlier also suggest questions. The savings-income ratio has, apart from cyclical variations, been rather constant, although marked changes occurred in the composition of saving. It appears, therefore, that the composition of saving could not have appreciably influenced the saving ratio. If so, the importance of a changing saving "portfolio" must be sought elsewhere. To some extent the changed composition of personal saving reflects a substitution of consumer for business-owned capital goods. The electric refrigerator and automobile are partial substitutes for the icehouse on the one hand and the streetcar and railroad on the other. While this study can therefore shed light on the role of technological change in the saving process, the saving-income relation first established by Duesenberry and Modigliani[5] has received further confirmation.

Observation that the division of saving among the seven different saver groups has changed little over the fifty-year period of this study provides ground for further speculation. Despite important changes in the composition of output, the labor force, and social and political institutions over this period, it appears that saving attitudes of individuals and of business have not been greatly affected. Thus, those who proclaim that the "New Deal" exerted a noticeable deterrent effect upon the private sector's attitudes towards thrift must seek evidence in other quarters. More broadly put, the stability of this relationship under varied circumstances, including important political changes, can be construed as support for the view that savings attitudes are subject to change only under rather extreme pressure. Possibly,

[4] Many more ramifications of the net-gross investment relationship are probed by Simon Kuznets, particularly the effects of growth and durability of capital. "International Differences in Capital Formation and Financing," in *Capital Formation and Economic Growth,* A Conference of the Universities-National Bureau Committee for Economic Research (Princeton, N. J.: Princeton University Press, 1955), pp. 19–106, especially Appendix B, pp. 76–81.

[5] James S. Duesenberry, *Income, Saving and the Theory of Consumer Behavior* (Cambridge: Harvard University Press, 1949), and Franco Modigliani, "Fluctuations in the Saving-Income Ratio," *Studies in Income and Wealth,* Volume II (New York: National Bureau of Economic Research, Inc., 1949).

attitude changes require a much longer period of time to reveal themselves than has elapsed from the thirties to 1949.

Long-run national saving ratios require a final word. As saving becomes more institutionalized, both through the expanded activities of social security and private devices, it may turn out that the saving ratio will be increased. This outcome, rather than the more frequently voiced reverse possibility, will depend on the extent to which the traditional saving habits of the upper income groups continue unchanged, while the middle and lower income groups, which previously saved small or negative amounts, become larger net positive savers.[6]

Another major conclusion, that we have entered the era of "contractual saving" in the form of pensions, insurance, and social security, deals with a change which has occurred so recently that its significance is hard to evaluate. Clearly, profound changes have taken place comparatively recently in the entire structure of finance. The financial intermediaries, insurance companies in particular, have become of great importance in the past several decades. Has this caused other changes in the economy? Future studies of economic development must assess more fully than has been done heretofore the influences, both quantitative and qualitative, that institutions exert on the savings and investment process. Has a shift of saving funds towards the hands of financial conservatives, like the insurance companies, influenced corporations to obtain their funds so heavily from internal sources, depreciation and retained earnings? How will this same shift affect the control of business enterprise? Has the enhanced role of consumer credit tended further to reduce the relative importance of the banking system in the economic structure? These rapid changes in the monetary sphere will force economic historian and economist alike to re-evaluate the interactions between financial and real factors in the development of an economy and its constituent parts. And, in that re-evaluation Goldsmith's data will be crucial.

These volumes largely meet the need for time series information on aggregate saving. In addition, Volume II is sure to become a primer in national income accounting methods. The great detail and clear exposition of how each estimate was obtained make this an extraordinarily useful work and a model for future enterprises of a similar nature.

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[6] Support for this proposition can be found in Table 17 of Simon Kuznets' *Shares of Upper Income Groups in Income and Saving,* National Bureau of Economic Research, Occasional Paper 35 (New York: National Bureau of Economic Research, Inc., 1950). This table shows that the ratio of saving to income before taxes changed little for the top one through the top five per cent of the income distribution in the years 1920 to 1940.