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THE REAL RATE OF U.S. NATIONAL SAVING

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The conventional measure of national saving in U.S. accounts does not include saving in consumer durables, public investment, or intangible capital. It reflects a measure of net foreign investment that relates in considerable part to original cost rather than market values. It also does not include real capital gains.

Comprehensive, adjusted measures of national saving are calculated for as many of the years from 1946 to 1989 as relevant components are available. They generally suggest much larger rates of national saving than are usually recognized. They also cast a sharp and substantially different light on the likely effects of policies designed to increase provision for the future.

1. ISSUES AND CONCEPTS

Are termites eating away at the foundations of our future well-being? Without the metaphor, is the United States rate of national saving too low? The answer is, you can't tell unless you measure it right. If it is too low, you can't tell what to do about it unless you know what you are talking about.

The conventional measure of "gross saving," as reported by the United States Bureau of Economic Analysis, is identically equal to the sum of gross private domestic investment and net foreign investment, minus the statistical discrepancy. On the saving side of the account, it is the sum of personal saving, corporate saving (undistributed corporate profits), private capital consumption allowances, and the government budget surplus (Federal and state and local, combined).[1] The "national saving" of common parlance is then *net* national saving, calculated by subtracting capital consumption allowances. This measure is deficient or misleading on several major counts.

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[1]We might suggest that here, as elsewhere, it is perfectly appropriate to include the total national income accounts surplus (or deficit) without distinguishing among surpluses in social security trust funds and deficits in the rest of the budget. The fact that politicians or others may choose to designate some revenues for one subaccount does not alter the relevant totality. They all go into the same pot. It may be added that what accountants designate as "in" the social security trust funds has nothing to do, in any economic sense, with what may be available to pay retirees or other beneficiaries in the future. That will depend upon the productivity of the people producing in the future, in turn related to the real wealth that has been accumulated. This will relate to the real saving discussed in this paper.

First, personal saving is defined as personal income minus personal taxes (and nontax payments) and personal outlays. The personal outlays in turn include personal consumption expenditures, interest paid by consumers to business and personal transfer payments to foreigners. The problem here is that "personal consumption expenditures" include vast amounts for consumer durables and semi-durables, which in meaningful terms would properly be counted as investment, and hence as saving.

Second, unlike in the United Nations System of National Accounts followed in much of the world, none of U.S. government expenditures for goods and services is included in investment, which, as designated, includes only *private* investment. Correspondingly, all government expenditures for goods and services are subtracted from government revenues in arriving at the budget surplus, which is the conventional definition of government saving.

Third, the net foreign investment figure, highly negative in recent years, reflects changes in the U.S. net international investment position where a major component, direct investment, is measured at original cost rather than current value. Appropriate corrections here (see Eisner and Pieper, 1990) very substantially eliminate the negative U.S. position and imply a considerable increase in the appropriate measure of national saving.

Fourth, while the net foreign investment measure is a particularly significant example, in general, measures of both income and saving and investment exclude the value of real capital gains and losses, so that net saving will correspond only by chance to economically relevant changes in wealth.

Fifth, and of overwhelming importance for critical questions of growth for which saving matters, our conventional measures exclude all saving and investment in intangible and human capital. Such saving and investment far exceed in magnitude, and very likely in importance, the private saving in tangible capital that gets so much attention.

And sixth, a dominant factor in the presumed decline of net national saving has been the very large relative, as well as absolute, increase in depreciation or capital consumption allowances. This, however, as shown by Pieper (1989), may well be viewed as a consequence rather than a cause of declining real growth. As growth of output approaches zero, unless the capital-output ratio *in*creases, the net saving and investment rates must also approach zero. At any point in time, the ratio of depreciation to fixed investment, and hence of net saving to gross investment and saving, may depend much more on the rate of past investment than the propensity to save.

An appropriate measure of national saving might then be written:

$$(1) \qquad NS^* = NS0 + INVCD + INVPUB + NFICOR + NR + INVINTAN - CCAADD,$$

where

NS^* = real net national saving (in current dollars)
NSO = the conventional measure of national saving
INVCD = gross investment in consumer durables and semidurables
INVPUB = gross public investment in tangible capital

NFICOR = the net correction to the measure of net foreign investment[2]
NR = net revaluations or real capital gains not included in NS0 or NFICOR
INVINTAN = investment in intangible capital in all sectors, particularly in research, education and health, and
CCAADD = the additional capital consumption related to the additional components of gross investment.

There might then be a further capital consumption correction (that we shall not undertake in this paper), which we may designate CCACOR, to reflect previous fluctuations in gross investment. This would enable us to calculate an adjusted rate of national saving, NS**, equal to the real net saving that would be generated by current gross saving if previous investment had been on a specified path of smooth growth. Thus,

$$NS^{**} = NS^{*} + CCACOR, \tag{2}$$

where CCACOR would depend upon the assumed rate of growth.[3]

The differences between real net national saving and the conventional measure of national saving about which there has been so much hand wringing are enormous. These differences have substantial import for international and intertemporal comparisons. With proper focus on the first, relevant measure we may still find cause for concern. The causes, however, will prove different. And so will reasonable remedies.

Take investment in transportation, as one salient example. In an earlier century in the United States, this involved in considerable part private investment in railroads. Through much of this century it has entailed huge amounts of government investment in roads and airports and private investment in automobiles. The former is financed by taxes and the latter is counted as consumption. Neither shows up as part of "saving." Is it proper then to judge our saving reduced to the extent the reduction is due to this shift from business to non-business investment?

Similar issues arise in international comparisons. France and more recently Germany have undertaken and are undertaking large amounts of investment in high-speed trains. This swells OECD figures for their total saving and capital

[2]NFICOR equals the change, measured in current dollars, in the real, net international investment position of the United States at market values, ΔUSIIPMV, as described in Eisner and Pieper (1990), minus the official or unadjusted change in the net international investment position as formerly presented by the Bureau of Economic Analysis.

$$\Delta USIIPMV_t = USIIPMV_t - USIIPMV_{t-1}(PEND_t/PEND_{t-1}),$$

where PEND = the mean of the GNP implicit price deflators for the fourth quarter of the current year and the first quarter of the subsequent year.

[3]$CCACOR = CCA - CCA^E$ where $CCA = \sum_{j=1}^{n} w_j I_j$, $\quad CCA^E = I_0 \sum_{j=1}^{n} w_j (1+g)^{-j}$,

I is gross investment subject to capital consumption allowances, the w_j ($=1/n$ for straight-line depreciation) are the depreciation rates on past years' investment, and g is the equilibrium or projected steady-state rate of growth of gross investment. Net national saving is thus corrected for the excess of capital consumption allowances over what they would have been if current gross investment had been reached by the steady-state rate of growth, g.

formation, but U.S. figures include all government investment as "government consumption." U.S. investment in new airports and runways (however inadequate) is generally a government project and not counted in "investment." With comparable inclusion of all public and private investment, the widely commented excess of Japanese over U.S. saving would be reduced.[4] However, if capital formation in education took into account hours spent in school and study and were, properly, to include the opportunity cost of students' time, Japanese investment in this vital form of human capital might be seen to dwarf that of the United States.

2. Measures

In Table 1.1, I present, for those of the years from 1946 to 1989 for which they are available, the major elements of conventional U.S. "national saving" (NS0D) and of suggested alternate measures, all percents of GNP.[5] In tables 2.1 and 3.1, I show the various other measures of national saving, almost all of which, I might suggest, would be more useful for much of macroeconomic analysis than the conventional measure, which receives most attention. Corresponding series on the basis of 1982 dollars are shown in Tables 1.2, 2.2, and 3.2.[6] Lists of abbreviations and definitions precede the tables.

The decline in conventional U.S. national saving over the last two decades may be viewed in the movements of its components. Comparing the periods 1971-81 and 1982-89, we note in Table A that the conventional measure of national saving fell from 6.87 percent to 2.38 percent, a drop of 4.49 percentage points. This represented a drop of 3.38 percentage points in the *gross* saving rate, which was coupled with a rise of 1.13 percentage points in the rate of capital consumption. Gross saving, it may be remembered though, is identically equal to gross private domestic investment plus net foreign investment minus the statistical discrepancy. The total of these last two (NFIDMISD) fell by 2.27 percentage points, which means that gross saving available to the U.S. to finance gross private domestic investment (GSD-NFIDMISD) declined by only 1.11 percentage points. (Gross private domestic investment in 1982 dollars, as a percent of GNP, was virtually unchanged, declining by only 0.20 percentage points.)

Applying the net foreign investment correction (NFICORD) to the conventional measure to obtain NS6D does not make a substantial difference over these entire periods of comparison. There was, however, a substantial swing in that correction from 1981-84 to 1985-89, of 2.38 percentage points, from −1.13 percent of GNP to +1.25 percent, as shown in Table B. This suggests corresponding corrections over those years in the private, business and government components

[4]See Hayashi (1986) for an illuminating analysis of this.

[5]A glossary of symbols for the elements of saving and definitions of the different measures of national saving is found immediately before the tables. The underlying figures, in billions of current and constant (1982) dollars, are available on request to the author.

[6]National saving in 1982 dollars is calculated, using the saving-investment identity, as NS0 = GPDI − CCA + (NFID − SD)/GNPDEF, where GPDI and CCA are gross private domestic investment and capital consumption allowances with adjustment, both in 1982 dollars, NFID and SD are net foreign investment and the statistical discrepancy, in current dollars, and GNPDEF is the implicit price deflator for gross national product.

DESIGNATIONS OF ELEMENTS OF ADJUSTED MEASURES OF NATIONAL SAVING

GSD, GS	Gross saving from national income and product accounts
CCAD, CCA	Capital consumption allowances with adjustment, from national income and product accounts
GPDID, GPDI	Gross private domestic investment
INVRAD, INVRA	Net investment in reproducible assets, excluding investment in consumer semidurables and government and household inventories
NFIDMISD, NFIMSD82	Net foreign investment minus statistical discrepancy, national income and product accounts
INVLAND, INVLAN	Net investment in land
NFICORD, NFICOR	Net foreign investment correction
INVINTAD, INVINTA	Net investment in intangible capital
INVSDID, INVSDI82	Net investment in consumer semidurables and government and household inventories
NRD, NR82	Net revaluations
NRMLND, NRMLN82	Net revaluations excluding land

N.B. First of designations above relates to series in current dollars, the second to series in 1982 dollars.

DEFINITIONS OF SAVING RATES

NS0	Conventional net national saving = gross saving − capital consumption allowances with adjustment
NS1	Change in total fixed reproducible capital plus net foreign investment minus statistical discrepancy
NS7	Change in total fixed reproducible capital plus net foreign investment minus statistical discrepancy (NSI) plus change in real value of land
NS6	Conventional net national saving (NS0) plus adjustment to net foreign investment
NS2	Change in total fixed reproducible capital plus adjusted net foreign investment minus statistical discrepancy (NS1 plus net foreign investment correction)
NS3	Change in total fixed reproducible capital plus adjusted net foreign investment minus statistical discrepancy (NS2) plus change in real value of land
NS14	Change in total fixed reproducible capital plus adjusted net foreign investment minus statistical discrepancy (NS2) plus investment in intangible capital and in government and household inventories and semidurables
NS15	Change in total fixed reproducible capital plus adjusted net foreign investment minus statistical discrepancy plus change in real value of land (NS3) plus investment in intangible capital and in government and household inventories and semidurables
NS16	Change in total fixed reproducible capital plus adjusted net foreign investment minus statistical discrepancy plus investment in intangible capital and in government and household inventories and semidurables (NS14) plus total net revaluations
NS17	Change in total fixed reproducible capital plus adjusted net foreign investment minus statistical discrepancy plus change in real value of land plus investment in intangible capital and in government and household inventories and semidurables (NS15) plus net revaluations exclusive of net revaluations on land

Note: All of above have been calculated in or put into 1982 dollars. A "D" following the saving number indicates saving in current dollars.

of gross saving, the proportions depending on which sector held the assets whose market values moved differently from evaluations used in the official accounts.

A major move to a comprehensive measure of saving entails relating it to a comprehensive measure of investment. This is accomplished by taking the change in the BEA's "constant-cost net stock of fixed reproducible tangible wealth," which includes government and household fixed capital as well as that of business and non-profit institutions, multiplying it by a price deflator calculated as the ratio of current-cost to constant-cost net stocks, and adding the change in business

TABLE 1.1

ELEMENTS OF ADJUSTED MEASURES OF CURRENT DOLLAR NATIONAL SAVING, AS PERCENT OF GNP

Year	GSD	CCAD	INVRAD	NFIDMISD	INVLAND	NFICORD	INVINTAD	INVSDID	NRD	NRMLND
1946	16.81	6.69	−5.32	1.98	−10.44	n.a.	11.03	−3.89	−35.44	−25.18
1947	18.07	7.48	−1.84	3.19	−0.93	n.a.	10.90	−4.15	9.33	10.54
1948	19.42	7.80	5.28	1.41	1.66	n.a.	10.50	−3.41	6.57	5.80
1949	14.06	8.45	4.25	0.04	2.23	n.a.	9.60	−1.21	2.52	−0.74
1950	18.21	8.19	12.89	−0.90	4.30	n.a.	10.47	−0.54	1.32	−1.71
1951	17.61	8.16	13.23	−0.54	4.53	n.a.	10.90	0.61	8.93	5.80
1952	14.87	8.30	11.99	−0.34	0.89	n.a.	10.30	2.27	−1.41	−3.40
1953	13.72	8.32	11.27	−1.05	1.85	n.a.	10.74	3.27	0.89	−1.28
1954	13.85	8.72	9.87	−0.67	2.62	n.a.	10.37	1.88	−0.72	−3.79
1955	16.83	8.47	12.65	−0.34	2.33	n.a.	11.63	0.66	4.81	−0.02
1956	18.08	8.90	11.32	1.10	4.25	n.a.	11.08	0.55	6.48	1.42
1957	17.10	9.11	9.08	1.33	3.20	n.a.	11.43	−0.29	1.82	−2.37
1958	14.14	9.37	7.36	0.22	3.63	n.a.	11.73	0.17	2.88	−2.48
1959	16.24	9.00	9.78	0.06	2.59	n.a.	12.42	−0.20	−0.11	−5.59
1960	16.34	9.00	8.68	1.16	3.70	n.a.	12.71	0.03	−0.35	−3.05
1961	15.46	8.95	8.18	1.01	2.40	n.a.	13.19	−0.60	0.70	−3.53
1962	15.91	8.60	9.41	0.66	0.92	n.a.	13.56	0.44	−0.01	−3.94
1963	16.25	8.47	10.00	0.91	1.89	n.a.	14.11	0.43	−1.20	−4.02
1964	16.70	8.29	10.37	1.37	2.12	n.a.	14.91	0.22	3.00	−0.72
1965	17.53	8.14	11.88	1.05	1.40	n.a.	14.99	−0.03	1.01	−2.59

1966	16.88	8.04	12.25	0.22	2.96	n.a.	15.84	0.01	1.55	−0.58
1967	15.87	8.26	10.59	0.48	0.18	n.a.	17.12	0.39	0.09	−1.58
1968	15.65	8.28	10.98	0.30	−2.59	n.a.	17.26	0.41	1.35	0.98
1969	16.47	8.44	10.74	0.58	−1.57	n.a.	17.54	0.75	−0.96	0.12
1970	15.23	8.74	8.39	0.58	−0.94	n.a.	18.20	−0.33	0.17	0.72
1971	15.60	8.84	9.41	−0.05	0.44	−0.60	18.48	0.05	−1.09	−0.19
1972	16.55	8.90	10.82	−0.11	3.42	2.63	18.95	−0.09	8.58	2.70
1973	18.53	8.69	12.02	0.96	5.13	−1.06	18.84	0.10	13.90	6.71
1974	16.83	9.34	9.74	0.48	1.59	−2.22	18.14	0.26	10.62	8.39
1975	14.93	10.12	5.50	1.19	1.44	−0.29	17.77	0.04	−3.47	−6.63
1976	15.88	10.05	7.63	0.30	6.24	−0.87	17.41	0.31	13.94	6.23
1977	16.85	10.12	9.49	−0.44	6.21	0.20	16.74	0.49	11.94	7.38
1978	18.16	10.22	11.26	−0.36	7.50	1.22	15.97	0.66	13.07	6.02
1979	18.28	10.60	10.49	0.14	6.90	3.10	15.34	0.41	9.46	5.04
1980	16.29	11.12	6.84	0.30	3.45	0.54	14.88	0.27	0.34	−2.19
1981	17.10	11.39	7.06	0.21	2.87	−3.93	14.67	0.32	−5.03	−0.37
1982	14.10	12.10	3.44	−0.03	−2.21	0.08	n.a.	n.a.	n.a.	n.a.
1983	13.61	11.65	4.95	−1.14	1.95	0.15	n.a.	n.a.	n.a.	n.a.
1984	15.07	11.01	9.70	−2.55	−0.87	−0.81	n.a.	n.a.	n.a.	n.a.
1985	13.29	10.89	9.15	−2.73	−0.15	0.98	n.a.	n.a.	n.a.	n.a.
1986	12.41	10.87	8.99	−3.17	2.61	2.95	n.a.	n.a.	n.a.	n.a.
1987	12.30	10.78	8.81	−3.19	3.05	0.63	n.a.	n.a.	n.a.	n.a.
1988	13.46	10.55	8.78	−1.87	0.58	1.31	n.a.	n.a.	n.a.	n.a.
1989	13.30	10.66	8.14	−1.53	2.02	0.38	n.a.	n.a.	n.a.	n.a.

TABLE 1.2

ELEMENTS OF ADJUSTED MEASURES OF 1982 DOLLAR NATIONAL SAVING, AS A PERCENT OF GNP

Year	GS	CCA	INVRA	NFIMSD82	INVLAN	NFICOR	INVINTA	INVSDI	NR82	NRMNL82
1946	18.21	8.02	−6.07	1.98	−10.44	n.a.	13.71	−2.52	−35.56	−25.27
1947	19.87	8.61	−1.77	3.24	−0.93	n.a.	12.47	−2.91	8.98	10.15
1948	20.19	8.73	4.74	1.36	1.66	n.a.	12.14	−2.51	6.18	5.46
1949	15.26	9.17	4.67	0.06	2.23	n.a.	11.62	−0.90	2.31	−0.67
1950	18.61	8.85	12.23	−0.88	4.30	n.a.	11.64	−0.41	1.20	−1.54
1951	17.17	8.42	12.03	−0.46	4.53	n.a.	11.13	0.49	7.88	5.11
1952	15.01	8.48	11.28	−0.30	0.89	n.a.	10.93	1.87	−1.23	−2.98
1953	14.04	8.51	10.94	−1.00	1.85	n.a.	11.21	2.71	0.79	−1.12
1954	14.34	9.00	9.67	−0.62	2.62	n.a.	11.54	1.49	−0.64	−3.35
1955	17.03	8.87	11.98	−0.32	2.33	n.a.	12.34	0.52	4.30	−0.02
1956	18.00	9.07	10.64	1.06	4.25	n.a.	12.26	0.44	5.68	1.25
1957	17.02	9.25	8.77	1.31	3.20	n.a.	12.83	−0.24	1.59	−2.07
1958	14.60	9.60	7.41	0.23	3.63	n.a.	13.13	0.14	2.58	−2.22
1959	16.65	9.32	9.74	0.04	2.59	n.a.	13.77	−0.17	−0.10	−5.07
1960	16.81	9.39	8.79	1.14	3.70	n.a.	13.96	0.02	−0.33	−2.80
1961	16.18	9.40	8.45	1.00	2.40	n.a.	14.24	−0.53	0.66	−3.29
1962	16.70	9.18	9.69	0.66	0.92	n.a.	14.52	0.39	−0.10	−3.73
1963	17.30	9.09	10.50	0.90	1.89	n.a.	14.96	0.39	−1.15	−3.85
1964	17.89	8.93	10.95	1.36	2.12	n.a.	15.66	0.20	2.90	−0.69
1965	18.63	8.80	12.44	1.04	1.40	n.a.	15.81	−0.03	0.99	−2.53

1966	17.90	8.70	12.74	0.23	2.96	n.a.	16.57	0.01	1.52	−0.56
1967	16.96	8.85	11.15	0.47	0.18	n.a.	17.53	0.36	0.09	−1.54
1968	16.86	8.87	11.46	0.30	−2.59	n.a.	17.57	0.39	1.33	0.96
1969	17.51	9.07	11.17	0.57	−1.57	n.a.	17.73	0.71	−0.94	0.12
1970	16.37	9.51	8.80	0.58	−0.94	n.a.	18.17	−0.32	0.17	0.71
1971	16.83	9.64	9.87	−0.05	0.44	−0.60	18.43	0.04	−1.08	−0.19
1972	17.73	9.71	11.17	−0.11	3.42	2.63	18.90	−0.09	8.53	2.69
1973	19.94	9.61	12.25	0.96	5.13	−1.06	18.72	0.09	13.97	6.74
1974	18.12	10.12	9.59	0.49	1.59	−2.22	17.76	0.25	10.51	8.30
1975	15.42	10.65	5.37	1.20	1.44	−0.29	17.51	0.04	−3.34	−6.38
1976	16.35	10.52	7.50	0.31	6.24	−0.87	17.06	0.32	13.51	6.04
1977	17.18	10.46	9.22	−0.44	6.21	0.20	16.48	0.52	11.47	7.09
1978	18.15	10.39	10.49	−0.36	7.50	1.22	15.66	0.71	12.38	5.70
1979	18.16	10.69	9.70	0.15	6.90	3.10	14.99	0.44	8.91	4.75
1980	16.28	11.17	6.40	0.29	3.45	0.54	14.29	0.29	0.32	−2.08
1981	17.00	11.38	6.67	0.21	2.87	−3.93	14.09	0.36	−4.87	−0.36
1982	14.10	12.10	3.44	−0.03	−2.21	0.08	n.a.	n.a.	n.a.	n.a.
1983	14.23	12.03	5.00	−1.14	1.95	0.15	n.a.	n.a.	n.a.	n.a.
1984	16.25	11.63	9.82	−2.55	−0.87	−0.81	n.a.	n.a.	n.a.	n.a.
1985	14.87	11.79	9.34	−2.73	−0.15	0.98	n.a.	n.a.	n.a.	n.a.
1986	14.04	11.93	9.26	−3.17	2.61	2.95	n.a.	n.a.	n.a.	n.a.
1987	14.21	11.98	9.00	−3.19	3.05	0.63	n.a.	n.a.	n.a.	n.a.
1988	15.70	11.94	9.13	−1.86	0.58	1.31	n.a.	n.a.	n.a.	n.a.
1989	15.88	12.29	8.53	−1.53	2.02	0.38	n.a.	n.a.	n.a.	n.a.

TABLE 2.1

MEASURES OF NATIONAL SAVING IN CURRENT DOLLARS, AS PERCENT OF GNP

Year	NS0D	NS1D	NS7D
1946	10.12	−3.34	n.a.
1947	10.59	1.35	n.a.
1948	11.62	6.70	n.a.
1949	5.61	4.29	6.52
1950	10.02	11.98	16.29
1951	9.45	12.69	17.22
1952	6.57	11.65	12.54
1953	5.41	10.22	12.06
1954	5.13	9.20	11.81
1955	8.35	12.31	14.64
1956	9.18	12.42	16.83
1957	7.98	10.41	13.46
1958	4.77	7.57	11.21
1959	7.24	9.84	12.42
1960	7.34	9.84	13.54
1961	6.50	9.19	11.59
1962	7.31	10.07	11.00
1963	7.78	10.90	12.80
1964	8.40	11.74	13.86
1965	9.39	12.93	14.33
1966	8.83	12.47	15.44
1967	7.62	11.07	11.24
1968	7.37	11.29	8.70
1969	8.03	11.32	12.89
1970	6.49	8.97	8.03
1971	6.76	9.36	9.80
1972	7.65	10.71	14.13
1973	9.84	12.98	18.11
1974	7.40	10.23	11.81
1975	4.81	6.69	8.13
1976	5.83	7.93	14.18
1977	6.73	9.05	15.26
1978	7.94	10.90	18.39
1979	7.68	10.00	17.53
1980	5.17	7.14	10.59
1981	5.71	7.27	10.14
1982	2.00	3.41	1.21
1983	1.97	3.81	5.77
1984	4.06	7.15	6.27
1985	2.40	6.42	6.27
1986	1.54	5.83	8.44
1987	1.52	5.62	8.67
1988	2.91	6.91	7.49
1989	2.64	6.60	8.64

TABLE 2.2

MEASURES OF NATIONAL SAVING IN 1982 DOLLARS, AS PERCENT OF GNP

Year	NS0	NS1	NS7
1946	10.19	−4.09	n.a.
1947	11.26	1.47	0.54
1948	11.46	6.09	7.76
1949	6.09	4.73	6.95
1950	9.77	11.35	15.65
1951	8.75	11.57	16.10
1952	6.53	10.98	11.87
1953	5.53	9.93	11.78
1954	5.34	9.05	11.67
1955	8.16	11.66	13.99
1956	8.93	11.70	15.95
1957	7.77	10.08	13.28
1958	5.01	7.64	11.28
1959	7.33	9.78	12.37
1960	7.42	9.93	13.64
1961	6.78	9.45	11.85
1962	7.52	10.34	11.26
1963	8.21	11.40	13.30
1964	8.95	12.31	14.43
1965	9.83	13.48	14.87
1966	9.20	12.97	15.93
1967	8.11	11.62	11.80
1968	8.00	11.76	9.17
1969	8.44	11.74	13.31
1970	6.86	9.38	8.44
1971	7.19	9.82	10.26
1972	8.02	11.06	14.48
1973	10.34	13.21	18.34
1974	8.00	10.08	11.66
1975	4.77	6.56	8.00
1976	5.83	7.81	14.05
1977	6.72	8.78	14.99
1978	7.76	10.13	17.62
1979	7.47	9.85	16.75
1980	5.10	6.69	10.14
1981	5.62	6.89	9.75
1982	2.00	3.41	1.20
1983	2.21	3.86	5.81
1984	4.62	7.27	6.39
1985	3.08	6.61	6.46
1986	2.11	6.09	8.70
1987	2.23	5.81	8.87
1988	3.76	7.27	7.85
1989	3.59	7.00	9.04

TABLE 3.1

MEASURES OF NATIONAL SAVING IN CURRENT DOLLARS, AS PERCENT OF GNP

Year	NS6D	NS2D	NS3D	NS14D	NS15D	NS16D	NS17D
1971	7.36	9.96	10.40	28.44	28.88	27.35	28.69
1972	10.28	13.34	16.76	32.29	35.71	40.87	38.41
1973	8.79	11.92	17.05	30.76	35.89	44.66	42.59
1974	5.27	8.00	9.59	26.15	27.73	36.76	36.12
1975	4.52	6.40	7.84	24.17	25.61	20.70	18.98
1976	4.96	7.07	13.31	24.47	30.71	38.41	36.94
1977	6.93	9.26	15.46	26.00	32.20	37.93	39.58
1978	9.16	12.12	19.61	28.08	35.58	41.16	41.60
1979	10.78	13.73	20.63	29.07	35.97	38.53	41.01
1980	5.72	7.68	11.14	22.57	26.02	22.91	23.83
1981	1.78	3.34	6.21	18.01	20.88	12.98	20.51
1982	2.07	3.49	1.29	n.a.	n.a.	n.a.	n.a.
1983	2.11	3.96	5.91	n.a.	n.a.	n.a.	n.a.
1984	3.25	6.34	5.47	n.a.	n.a.	n.a.	n.a.
1985	3.38	7.40	7.25	n.a.	n.a.	n.a.	n.a.
1986	4.49	8.77	11.38	n.a.	n.a.	n.a.	n.a.
1987	2.14	6.24	9.30	n.a.	n.a.	n.a.	n.a.
1988	4.22	8.22	8.81	n.a.	n.a.	n.a.	n.a.
1989	3.01	6.98	9.01	n.a.	n.a.	n.a.	n.a.

inventories.[7] The total as a percent of GNP, denoted INVRAD for investment in reproducible assets, is shown in Table 1.1; the corresponding constant-dollar series, INVRA is found in Table 1.2. We then add NFIDMISD, net foreign investment minus the statistical discrepancy (NFIMIS82 in the constant dollar series) to obtain measures of national saving (NS1D, shown in Table 2.1, and NS1 in Table 2.2), which include government and household net investment. These, however, are still exclusive of government and household investment in semidurables and inventories and of all investment in land.

Substantial growth in stocks of consumer durables kept down the decline in investment in reproducible assets. As seen in Table A, from 1971-81 to 1982-89, the fall in the mean value of INVRAD was only 1.37 percentage points, from 9.11 percent of GNP to 7.74 percent, and only 0.99 percentage points for INVRA, in 1982 dollars. The drop in the corresponding measure of national saving, NS1D, with the inclusion of net foreign investment, was again considerable however, coming to 3.63 percentage points; the drop was 3.25 percentage points for NS1, in 1982 dollars.

We may next add saving in the form of increases in the real value of land. This is calculated from the "Balance Sheets for the U.S. Economy" prepared by the Federal Reserve's Flow of Funds division. We take the year-end values of land at market prices and deflate by year-end GNP price deflators (the average of fourth-quarter and subsequent first-quarter figures) and consider the differences in these deflated values as real saving in land. We then multiply these differences

[7]From Summary Fixed Reproducible Tangible Wealth Series, 1925-88, *Survey of Current Business*, October 1989, pp. 32-33, updated from tables furnished by John Musgrave, of the U.S. Bureau of Economic Analysis.

TABLE 3.2

MEASURES OF NATIONAL SAVING IN 1982 DOLLARS, AS PERCENT OF GNP

Year	NS6	NS2	NS3	NS14	NS15	NS16	NS17
1971	7.79	10.42	10.86	28.85	29.29	27.77	29.10
1972	10.65	13.69	17.11	32.59	36.00	41.12	38.70
1973	9.28	12.16	17.28	30.88	36.00	44.84	42.74
1974	5.78	7.85	9.44	25.61	27.20	36.12	35.50
1975	4.48	6.27	7.71	23.78	25.22	20.43	18.84
1976	4.96	6.94	13.18	24.00	30.24	37.51	36.28
1977	6.92	8.98	15.19	25.46	31.67	36.94	38.46
1978	8.98	11.35	18.84	28.00	34.50	39.38	40.20
1979	10.57	12.95	19.85	27.94	34.83	36.85	39.58
1980	5.65	7.23	10.68	21.52	24.97	21.84	22.89
1981	1.70	2.96	5.83	17.05	19.91	12.18	19.55
1982	2.07	3.49	1.28	n.a.	n.a.	n.a.	n.a.
1983	2.35	4.00	5.96	n.a.	n.a.	n.a.	n.a.
1984	3.82	6.46	5.59	n.a.	n.a.	n.a.	n.a.
1985	4.06	7.59	7.44	n.a.	n.a.	n.a.	n.a.
1986	5.06	9.04	11.65	n.a.	n.a.	n.a.	n.a.
1987	2.85	6.44	9.50	n.a.	n.a.	n.a.	n.a.
1988	5.07	8.58	9.17	n.a.	n.a.	n.a.	n.a.
1989	3.97	7.38	9.42	n.a.	n.a.	n.a.	n.a.

by the corresponding annual GNP implicit price deflators to get the current dollar values of saving in the form of increases in the value of land, INVLAND (INVLAN in the constant dollar series), over and above that accountable to general inflation.[8]

The saving measure, NS2D (NS2 in the constant dollar series) adds the net foreign investment correction, NFICORD (or NFICOR in constant dollars), to the comprehensive net fixed investment series. The measures NS3D (and NS3) then add to NS2D (and NS2) investment in land. NS3D (and NS3) are thus also equal to NS7D (and NS7) plus the net foreign investment correction.

Our measure of investment in land (INVLAND), which may suffer from infirmities in the underlying data, indicates a sharp fall, from 4.11 percent of GNP in 1971-81 to 0.87 percent in 1982-89. This in turn brings down the current dollar measures, NS7D and NS3D, by 6.87 and 6.15 percentage points, from 13.46 percent to 6.59 percent and from 13.45 percent to 7.30 percent, respectively.

By far greatest in amount and possibly, we may suggest, in current significance at the margin, is investment in intangible capital. We fall back here on my TISA ("Total Incomes System of Accounts") estimates.[9] These were built up in some

[8]Changes in the Federal Reserve's value of land at market prices in principle reflect: (1) general increases in land prices in excess of increases in all prices—what we refer to as net revaluations; (2) changes in the general level of all prices or gains corresponding to inflation; and (3) increases in the value of land as a consequence of investment expenses or development. With the available data, our measure of investment in land in fact cannot distinguish between (1) and (3) and hence includes both. In the measures of saving presented below including both investment in land and net revaluations, NS17D and NS17, we therefore include from TISA, as indicated below, total net revaluations *exclusive* of land.

[9]See Eisner (1985 and 1988). Kendrick (1976) laid foundations for much of the TISA accounts. Note also the work of Ruggles and Ruggles (1982), particularly with regard to revaluations and integration of stocks and flows.

TABLE A

SAVING MEASURES AND COMPONENTS, MEAN PERCENTS OF GNP, 1971-81 AND 1982-89

Series	Current Dollars 1971-81	1982-89	Difference
GSD	16.82	13.44	−3.38
CCAD	9.94	11.07	+1.13
NS0D	6.87	2.38	−4.49
GPDID	16.58	15.47	−1.11
INVRAD	9.11	7.74	−1.37
NFIDMISD	0.24	−2.03	−2.27
NS1D	9.35	5.72	−3.63
INVLAND	4.11	0.87	−3.24
NS7D	13.46	6.59	−6.87
NFICORD	−0.01	0.71	+0.72
NS2D	9.35	6.43	−2.92
NS6D	6.87	3.09	−3.78
NS3D	13.45	7.30	−6.15
INVINTAD	17.02		
INVSDID	0.25		
NRD	6.57		
NRMLND	3.01		
Series	1982 Dollars 1971-81	1982-89	Difference
GS	17.38	14.91	−2.47
CCA	10.39	11.96	+1.57
NS0	6.98	2.95	−4.03
GPDI	17.14	16.94	−0.20
INVRA	8.93	7.94	−0.99
NFIMSD82	0.24	−2.02	−2.26
NS1	9.17	5.92	−3.25
INVLAN	4.11	0.87	−3.24
NS7	13.28	6.79	−6.49
NFICOR	−0.01	0.71	+0.72
NS2	9.16	6.62	−2.54
NS6	6.98	3.66	−3.32
NS3	13.27	7.50	−5.77
INVINTA	16.72		
INVSDI	0.27		
NR82	6.39		
NRMLN82	2.94		

detail in current and 1972 dollars for various components of investment in edcuation and training, research and health.[10] Constant dollar totals used in this paper were crudely converted to 1982 dollars by dividing by the GNP 1982 dollar implicit price deflator for 1972.

The ratio of net investment in intangible capital to GNP in current dollars (INVINTAD), as shown in Table A, averaged 17.02 percent over the years 1971

[10]A full description of sources and methods of TISA series is to be found in Eisner (1989).

TABLE B

NET FOREIGN INVESTMENT CORRECTIONS

	Percents of GNP		
	1981–84	1985–89	Change, 1981–84 to 1985–89
Net Foreign Investment (NFID)	−0.77	−2.76	−1.99
Net Foreign Investment Correction (NFICORD)	−1.13	+1.25	2.38
Adjusted Net Foreign Investment NFMADJD)	−1.90	−1.51	−0.39

to 1981. (TISA estimates, beginning in 1945 and 1946, extend only to 1981.) This may be compared to the conventional saving ratio, NS0D, of 6.87 percent for that period, the ratio of 9.35 percent for NS2D, which includes investment in all reproducible fixed capital, and the ratio of 13.45 percent for NS3D, which also includes investment in land.

We add net investment in intangible capital and the relatively small amounts of net investment by government and households in inventories and semidurables to NS2D to get a measure of saving, NS14D, including all investment in tangible reproducible capital and in intangible capital. We add investment in land to obtain the measure, NS15D. Now the ratios of saving to GNP, as seen in Table C, become truly large: 26.36 percent for NS14D over the 1971–81 period and 30.47 percent for NS15D, the measure including investment in land.

Finally, we can add saving in the form of net revaluations of tangible assets, that is, capital gains over and above those accountable to inflation. These give

TABLE C

COMPARISON OF MEAN SAVING RATIOS, 1971–81

Current dollars		Constant dollars	
Measure	Mean (% of GNPD)	Measure	Mean (% of GNP)
NS0D	6.87	NS0	6.98
NS1D	9.35	NS1	9.17
NS7D	13.46	NS7	13.28
NS6D	6.87	NS6	6.98
NS2D	9.35	NS2	9.16
NS3D	13.45	NS3	13.27
NS14D	26.36	NS14	25.88
NS15D	30.47	NS15	29.98
NS16D	32.93	NS16	32.27
NS17D	33.48	NS17	32.92
NS0D/NS14D	26.06	NS0/NS14	26.97
NS0D/NS15D	22.55	NS0/NS15	23.28
NS0D/NS16D	20.86	NS0/NS16	21.63
NS0D/NS17D	20.52	NS0/NS17	21.20

us ratios of national saving to GNP of 32.93 percent for NS16D and 33.48 percent for NS17D, the measure including investment in land.

We may note how far we have gone by observing, in Table C, that the mean for the current dollar ratios for the years 1971 to 1981 of conventional national saving, NS0D, divided by the mean for our comprehensive measure including all investment in tangible and intangible capital other than net revaluations, NS15D, is only 22.55 percent. The corresponding proportion involving the measure including net revaluations, NS17D, is 20.52 percent.

3. Analysis and Conclusion

There is nothing sacrosanct about any of the time series of national saving presented in the tables of this paper. Others may have somewhat different estimates and may include different components.[11] Our series do preserve the identity of aggregate saving and investment, but generally reflect broader measures of investment than the simple sum of net private domestic investiment and net foreign investment (minus the statistical discrepancy) found in conventional accounts in the United States. In the case of marketable, tangible assets, they are oriented toward market values. The measures of intangible investment, including essentially unmarketable (in a non-slave economy) human capital, however, are calculated on a cost basis.

We have no ready answer to the question posed initially, "Is the rate of national saving too low?" If our concern is for future well-being in terms of the quality of life and consumption services to be enjoyed, it must be clear, though, that the answer relates to the broader, more comprehensive measures of saving. Investment by government and households is in principle as important as investment by business.[12] Measures of net foreign investment should certainly reflect changes in the current values of domestic and foreign claims. Developing and preserving our land may be as important as the structures we build upon it. Investment in human and intangible capital generally is huge in amount and, in the minds of many, critical in importance.[13] It is important to note that the current wealth which we carry into the future, for whatever reasons of externalities, changes in risk and changes in intertemporal and international price ratios, depends upon more than the original cost of investment.

It is important to recognize that various policy proposals to handle the issue of national saving have greatly different implications for the different measures of saving. For one thing, it is only conventional saving, dominated by gross private domestic investment, that is largely determined by market forces. Here, contrary to conventional wisdom, conventionally measured government dissaving—the budget deficit—may actually have a positive effect. In other work, indeed, I have pointed out that structural, cyclically adjusted, or "high-employ-

[11]Our concepts and measures may be compared with those in parallel work of Bradford (1989a and 1989b).

[12]Suggestion of particularly important contributions of government investment to productivity is to be found in work of Aschauer (1989).

[13]Some support for this view is offered in estimates of production functions reported in Eisner (1989, Appendix D).

ment" real budget deficits have been associated with *in*creases in gross private domestic investment.[14] However, beyond providing a generally sound macroeconomic foundation, it is not clear that we should interfere with the narrowly-defined-saving decisions of private agents and the market forces determining business investment. "Incentives" to save and invest more, I have pointed out on many occasions, are of limited effectiveness.[15] To the extent that they are effective, they may only result in increases of relatively unproductive investment, that was not considered sufficiently profitable or productive to undertake without special subsidies.

A major problem, though, is that measures directed ostensibly to raising saving by its conventional measure may, and on many occasions will, almost certainly reduce the economically relevant more comprehensive measures. Thus tax increases to hold down consumption are likely to have major impact on investment in durable goods. Is it necessarily desirable to have households buy fewer new automobiles in the (probably misguided) hope that Hertz and Avis will increase their fleets, thus raising business investment? Cuts in government expenditures—for roads, airports, waste disposal, education and research—reducing budget deficits will, if there are not offsetting reductions in private income and saving, raise saving by its conventional measure, but they will surely reduce saving by the more comprehensive measures we have presented.[16]

Finally, of major importance, while business investment, the core of conventional saving, may well be left to a reasonably free market, saving in its broader measures does depend very much on public policy. Our work indicates that saving by all definitions has declined in recent years. It is to wise public policy, divorced from myths and dogma attached to conventional measures, that we must turn to bring about and maintain appropriate mixes and aggregates of real national saving.

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[14]See Eisner (1986), and Eisner and Pieper (1984 and 1988), *inter alia.*

[15]See, for example, Chirinko and Eisner (1983), and also Chirinko (1987).

[16]Eisner (1990) presents a number of empirical results for the United States, over various parts of the last four decades, indicating that larger structural budget deficits have been associated with even more conventional national saving in the following year. This was generally all the more true for comprehensive measures of saving.

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