

CHAPTER Ce

Saving, Capital, and Wealth

Editor: Richard Sutch

SAVING, CAPITAL, AND WEALTH

Richard Sutch

Definitions and Distinctions

There are two, somewhat opposing, reasons to be interested in how and why society saves. First, saving is one of two primary influences on the rate of long-term growth in per capita output, technological innovation being the other determinant of growth. The creation of capital is closely related to technological change because most technological innovations are achieved through investment and are thus “embodied” in capital. Second, saving may not be an unmixed blessing. In the short run, saving too much while investing too little (underconsumption) could mean that private demand falls short of the economy’s capacity to produce, leading either to unemployment and recession or to the need for compensatory government spending to fill the gap. The opposite problem of too little saving could induce the unhappy consequence of inflation as aggregate demand exceeds capacity.

Saving and Savings

In economics, “saving” is defined and measured as a *flow*, the portion of the flow of personal (or national) income that is accumulated rather than spent or transferred. “Savings” (a singular noun ending in *s*) refers to an accumulated *stock* of saving, as in the term “savings account.” In common use, saving refers to *net* saving, the difference between income and outlays. However, some of those outlays are for the repair or replacement of the existing capital stock; so gross saving is defined to include allowances for the “consumption of fixed capital.” Refer to Table Ce-A for the variant definitions of saving. Account 5 in Table Ca-D and the discussion in the essay on national income and product in Chapter Ca provide additional details on how saving is defined in the national accounts.

National saving consists of personal saving (by households and nonprofit entities), corporate saving, and government saving. Corporate saving is often called retained earnings. Government saving is also called the government budget surplus (when positive) or the government deficit (when negative). Gross national saving includes the allowances for the consumption of fixed capital. By definition,

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gross national saving, which is based on the income side of the national accounts, should equal gross investment, which is calculated from the product side. In practice they do not, so gross investment actually equals gross saving plus the statistical discrepancy (see Chapter Ca on national income and product).

Saving is equal to current income less current consumption. To be more precise, then, we must turn to the definitions of the components. In most treatments, current income is thought of as earned income after taxes, or disposable income. Disposable income excludes capital gains, whether realized or not. The preferred definition of current consumption for the purpose of defining saving is the total current outlays on *nondurable* goods and services. This definition of saving, which we label the “standard concept” (it was so named by Raymond Goldsmith), includes the outlays for consumer durables as part of saving (Goldsmith 1955, volume 1, p. 30). When individuals purchase a consumer durable (say an automobile or refrigerator), the outlay represents an investment in an asset that will yield a flow of services (transportation services or refrigeration services) over the life of the durable. The household is saving when it purchases a consumer durable because it is forgoing current consumption in exchange for a flow of services in the future.

For this treatment of consumer durables to be consistent with the standard concept of saving, the definition of income and consumption would need to be expanded beyond the concept used by the Bureau of Economic Analysis (BEA) when it calculates the national income and product accounts (NIPA). See the bottom row of Table Ce-A. Both income and consumption should include the flow of consumption services produced by the stock of consumer durables. However, if we constrain our attention to saving, that flow would cancel out because it would be part of both current income and current consumption.

Saving may be defined on either a gross or a net basis. The difference is an accounting allowance for capital consumption (depreciation). Business accounting practice typically makes a charge against income for the estimated cost of depreciation. Often, however, only the original cost of the capital (book value) is depreciated and then often on an ad hoc basis. The BEA replaces this business estimate of depreciation with its own estimates of the “consumption of fixed capital,” defined as the decline in the value of the stock of assets “due to wear and tear, obsolescence, accidental damage, and aging.” Because a key reason for the interest in saving is its role in expanding the productive capital stock, saving is usually expressed in net terms.

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TABLE Ce-A Relation among various definitions of saving

| Various saving concepts | | | | | | Change in total net worth | |
|--|------------------|--|--|--|--|--|---|
| Net saving: change in earned net worth | | | Gross saving: net saving PLUS consumption of fixed capital | | Standard ⁶ | | |
| Components of national saving | Private saving | Personal saving ¹ | Narrow | Standard | | Broad | Expanded |
| | | | | Personal disposable income; LESS personal outlays ² | PLUS expenditures for consumer durables | PLUS net agricultural capital improvements; PLUS increase in the value of the slave population | PLUS net increase in human capital ⁵ |
| | Corporate saving | Undistributed corporate profits ³ | | | PLUS corporate research and development expenditures | PLUS capital consumption allowances for corporate fixed capital | |
| Government saving | | Government surplus ⁴ | | PLUS government research and development expenditures | PLUS capital consumption allowances for government fixed capital | | |

Corresponding definition of personal income

| Bureau of Economic Analysis (BEA) definition | | Bureau of Economic Analysis (BEA) definition | |
|--|--|--|--|
| PLUS flow of services from consumer durables | PLUS increase in the value of the slave population; LESS consumption by slaves | PLUS income forgone while in school; PLUS corporate and government expenditure on training and education | PLUS flow of services from consumer durables |

¹ Includes nonprofit organizations and unincorporated businesses.

² Personal disposable income is personal income less personal tax and nontax payments. Personal outlays include personal consumption expenditures, interest paid by persons, and personal transfers to the rest of the world.

³ Includes inventory valuation and capital consumption adjustments.

⁴ Government surplus or deficit (-) on national income accounts basis.

⁵ Includes increases in human capital financed by government and corporations.

⁶ Net or gross as desired.

The standard concept of net saving is distinguished from the official BEA definition because the latter excludes consumer durables. For this reason, the official definition is sometimes called the “narrow concept.” In addition, we also wish to propose a “broad concept” of saving that would expand the standard concept by including (1) the capital value created by members of farm families when they engage in land clearing, soil improvement, and farm building and (2) the value of the increase in the stock of slaves. Although the broad concept has little relevance in today’s economy, it is significant in historical studies of saving and capital formation in the early nineteenth century.

Other variations on the concept of net saving are, of course, possible. For example, some would expand the concept to include activities that increase human capital, such as formal education and skill acquisition (Schultz 1960; Schultz, 1962; Becker 1964/1993). To do that, not only the current outlay for education (tuition, cost of books, etc.) but also the income lost while the individual was attending classes would have to be included as a form of saving (and investment). As another example, some have suggested that business expenditures on research and development be classified as investment (rather than as an intermediary product) because they are intended to increase the future productivity of the economy. The result would be to increase corporate and government saving and thus national saving (Kendrick 1961, p. 25).

There is an alternative to the definition of saving as a flow. For any unit, saving may also be defined as the *change* in earned net worth during the year. This difference is not estimated from the income account but rather from the balance sheet. The balance sheet records the net worth of the economic unit by including all assets and liabilities. If consistent methods of accounting are observed, the two measures of saving are identical. Every dollar of income that is not spent on services and nondurable commodities must be used either to increase the holdings of financial assets and the ownership of tangible capital (consumer durables), or to reduce financial liabilities (consumer debt). Thus, saving is equal to the change in assets minus the change in liabilities. To exclude capital gains and losses, only the change in *earned* net worth is considered.

Saving and Wealth

Broadly speaking, the purpose of saving is to increase wealth. At the individual level, this is often accomplished by depositing the excess income into a cash account or by purchasing one or more of a wide variety of financial assets, such as bonds, stocks, or shares in a mutual fund. The terms “financial capital” and “financial wealth” refer to the value of these resources. Purchasing real estate or durable goods will also increase personal wealth, though these physical assets are most often acquired for the flow of services they provide. Command over financial assets gives individuals and households a buffer that allows them to stabilize consumption in the face of fluctuating income. These stocks can also provide protection in the event of an unexpected diminution of income caused by ill health, unemployment, or other catastrophe. Saving can also be motivated by a desire to accumulate sufficient money to meet a large expenditure planned for the future, as when we save for a vacation or for a child’s college education.

A major motivation for saving is to build a stock of assets that can be used to finance retirement. In the United States today, most individuals save to supplement the benefits they are due under the Social Security system. They save heavily during their peak earning

years by contributing to their employer-established pension fund, by accumulating equity in their homes, and by acquiring financial assets such as equities and government and corporate bonds. At a later point in life, they plan to draw upon these assets to finance a flow of consumption that exceeds their income. Thus, at any one point in time, some individuals will be saving and others will be “dissaving.”

Generally speaking, the saving of savers will exceed the dissaving of those who are drawing down their stock of assets. This phenomenon occurs for several reasons. Population is growing, so the young and middle-aged savers outnumber the older dissavers in the population. Throughout most periods of U.S. history, the productivity of labor has grown, so the young and middle-aged savers will be saving to finance a retirement standard of living that they anticipate will be higher than the standard of living enjoyed by those currently in retirement (Modigliani 1966). Immigrants to the country also tend to help ensure that the overall level of saving is high. Most immigrants come as young adults in their peak earning years, swelling the ranks of savers relative to the older dissavers. Moreover, immigrants may be heavy savers compared to their native-born counterparts because they will have expended some of the wealth they accumulated before immigration in the costs of migration, including financing their consumption during the period they were in transit and establishing themselves before they secured their first U.S. employment. Restoring this wealth to the level commensurate with their new income will require, at least temporarily, a high saving rate (Carter and Sutch 1999, pp. 327–30).

Accumulating financial wealth is a way for an individual to move resources earned in the present into the future. However, society as a whole cannot do this. In the future, what society will consume, for the most part, will be goods and services produced in the future. We do not literally stockpile food and other nondurable commodities produced today for consumption decades later. Even if that were practical, services produced today have no physical manifestation and so cannot be saved for future consumption. Rather than stockpiling commodities, individuals stockpile purchasing power. The individual converts savings into money (or some other financial asset). For this strategy to be attractive, one needs to have the confidence that the value of money and the enforceability of contracts will hold up reasonably well and the expectation that one will be able to buy what is needed and desired some years far in the future. Thus, stable financial and political institutions will promote saving, while uncertainty and instability will reduce it.

Saving and Investment

Output that is not purchased for consumption in the year that it is produced is, by definition, invested. Much of this would be intended investment, though some of it may be manifest in an unintended increase in the inventory of goods, goods that went unsold because demand from consumers was not what was anticipated.

“Investment” refers to both the act of investing and the amount invested. “Investing” is the commitment of money (or other resources) in the hope of future gain. Business enterprises invest in tangible capital (machines, tools, vehicles, buildings) with the expectation that the production made possible with the help of capital will lead to an overall profit. Individuals acquire (and thus invest in) human capital through education and skill acquisition with the expectation that their future incomes, enhanced by the productivity

attributable to additional knowledge, will increase enough to generate a positive rate of return. Much of the commitment made by those investing in human capital takes the form of forgone income during the period of schooling or training. Thus, it is convenient to think of that foregone income as income saved to finance the human capital (Becker 1964/1993).

The act of investment will be based on the investor's expectations about the returns that will be earned from the expanded capacity to produce. A general optimism about such matters will raise the level of investment; a general pessimism will decrease it. The cost of devoting the resources to a potential investment should also influence the willingness to undertake the investment. Those costs can be direct, as when the money must be borrowed and interest paid for the privilege of using someone else's money, or indirect, as when the money is diverted from another investment, thus sacrificing a rate of return elsewhere. Generally speaking, the higher the rate of interest is, the lower the volume of investment spending becomes. A fall in the rate of interest should stimulate investment.

Interestingly, saving is much less likely to be sensitive to the interest rate than investment because, in most cases, the motivation for saving is to achieve some target for accumulated assets. On the one hand, a high rate of interest represents a higher reward to saving and can be expected to increase the size of the desired target and thus the required rate of saving. However, with a high rate of return on financial assets, one can achieve any given target with less saving, as the interest payments received will be larger. The empirical studies that have been done suggest that the two effects approximately offset each other, leaving saving largely unaffected by changes in interest rates, at least within the range of variation of interest rates experienced in the last century (Modigliani 1975; Modigliani 1989, p. 44).

As with saving, a distinction is made between net investment and gross investment. Gross investment includes an allowance for the consumption of fixed capital. Thus, net investment must be positive for the capital stock to grow. Moreover, the capital stock must grow faster than the labor force, if the capital-labor ratio is to rise. When this happens, the process is called capital deepening.

National Saving and Private Saving

For the economy as a whole, national saving is the sum of private saving and government saving, while private saving is the sum of personal saving (generated by households and nonprofit institutions) and corporate saving (see Table Ce-A). The national saving rate is national saving expressed as a percentage of gross national product (GNP) because gross domestic product (GDP) excludes income earned abroad. Figure Ce-B plots the rate of gross national saving (as defined by the NIPA without consumer durables). A substantial proportion of gross saving is used to replace fixed capital lost through depreciation, obsolescence, or destruction (see Table Ce69–90). Net saving, plotted on the same figure, excludes the allowances for capital consumption.

Because government's contribution to net national saving is the government budget surplus, government deficits reduce national saving and reduce net investment in fixed capital. When the government runs a budget deficit, it borrows from the public by selling government bonds. From the point of view of a saver, government bonds are one of many assets that can be acquired to augment personal wealth. So government debt displaces tangible capital from the national portfolio (Modigliani 1961).

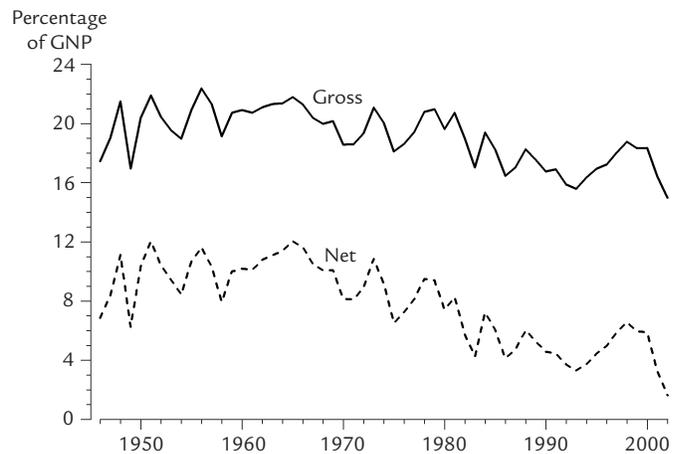


FIGURE Ce-B National savings rates, without consumer durables: 1946–2002

Sources

Series Ce125–126.

Estimating Personal Saving

There are two widely cited data series on personal saving. The BEA calculates one as a residual component of the NIPA. The Board of Governors of the Federal Reserve System (FRB or the Fed) calculates the alternative measure as part of its Flow of Funds Accounts. Conceptually, the two measures should be identical, but they differ because of both practical measurement problems and different treatments of several components.

The BEA measure is calculated as the difference between income and outlays (including outlays for consumer durables) and thus represents a narrow definition of saving (series Ce71). However, the standard definition of saving can be computed from the BEA data on purchases of consumer durables (series Ca91) and the stocks of these assets that are included in the BEA's estimates of tangible wealth (series Ce295). The BEA treats government-employee insurance and pensions as a component of government saving (series Ce79) rather than personal saving (for more detail, see Larkins 1999).

The FRB measures personal saving as the change in the net worth of households and nonprofit organizations (Table Ce91–121). Net worth includes both financial and tangible assets offset by household liabilities. The FRB treats both consumer durables and residential structures as tangible assets and includes the insurance and pension funds of government employees and thus represents the standard definition of saving.

The personal saving rate is defined as personal saving expressed as a percentage of disposable personal income, that is, income after tax (series Ca68). Figure Ce-C plots the BEA measure of the personal saving rate from the NIPA and the FRB flow of funds measure, which was adjusted to be comparable by excluding consumer durables. One notable feature, which has been widely remarked upon, is that both measures document a steady decline in the personal saving rate during the last twenty years of the twentieth century. One common explanation for this decline is the impact of stock market capital gains (Peach and Steindel 2000; Poterba 2000). When the value of stock market holdings increases, some may feel more prepared for retirement and thus free to consume more and save less.

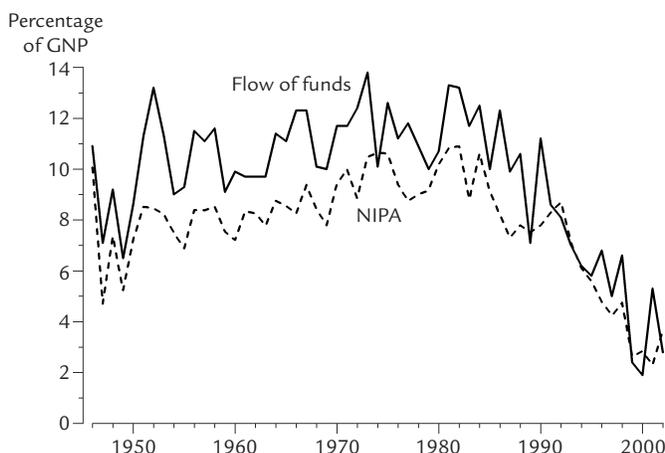


FIGURE Ce-C Personal saving rate, without consumer durables: 1946–2002

Sources

Series Ce122 and Ce124.

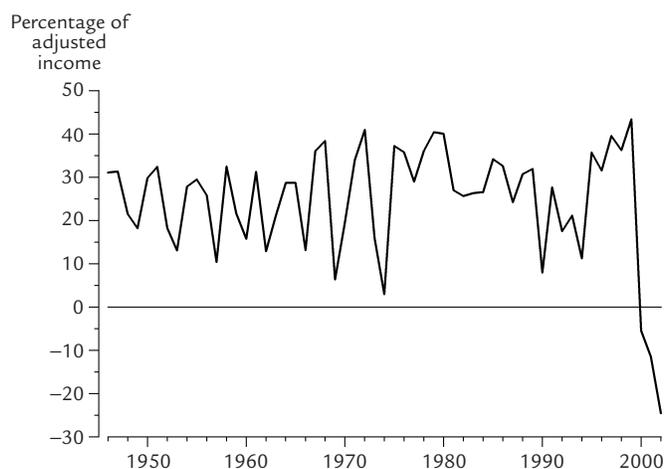


FIGURE Ce-D Personal saving rate, including capital gains: 1946–2002

Sources

Series Ca68, Ce71, and Ce127.

Documentation

The personal saving rate shown here includes both realized and unrealized capital gains. The series plotted is the annual change in the net worth of households and nonprofit organizations (computed from series Ce127), as a percentage of adjusted income. Adjusted income is equal to disposable income (series Ca68) less the Bureau of Economic Analysis concept of personal saving (series Ce71) plus the change in net worth (computed from series Ce127).

By definition, changes in net worth are produced either by saving or by capital gains. If we take a very broad definition of income to include all capital gains, whether realized or not, then saving would be redefined as the change in household net worth, that is, the change in series Ce127 (Peach and Steindel 2000). This broadened view of the saving rate is plotted in Figure Ce-D. The change in net worth is divided by adjusted income, which is defined as disposable income minus personal saving plus the change in net worth. This view puts personal saving at a much higher rate, with a decline in the 1980s and a recovery in the 1990s. The rapid fall to

negative rates after 2000 is caused by a dramatic decline in stock market values.

The official figures on personal saving based on the flow of funds accounts begin with 1946. These can be extended back to 1897 using the estimates of personal saving made by Raymond Goldsmith (Tables Ce1–68). Goldsmith also presents estimates for net national saving, business saving, and government saving (Table Ce1–12). Except for corporate saving, Goldsmith estimates saving as the change in earned net worth. In this respect, his method resembles that used by the FRB when calculating saving.

Goldsmith is candid about the fact that his estimates are imprecise. He describes the reliability of the estimates in the following terms:

Evaluation of the possible errors in the individual series from which the estimates of group and national saving have been constructed indicates that the margin of error is hardly under 10 percent for any given year or for the average annual figure in any series, that it is probably in the order of magnitude of 20 to 30 percent in many of them, that it may run even higher in not a few cases, but that the relative margin of error in most cases is reduced for sequences of several years and generally the smaller the longer the period.

The quality of most of the individual series used in the measurement of saving has undoubtedly improved. It would seem to be substantially poorer for the period before the thirties than for the last two decades, and within the earlier period, in turn, to be particularly poor for the years before approximately 1905. . . . There is, however, evidence . . . that the error is . . . in the direction of an overstatement of saving in the first three decades and an understatement during the thirties. (Goldsmith 1955, volume 1, pp. 40–1)

Nineteenth-Century Transformation of Saving Behavior

Robert Gallman (1966) discovered that the American economy experienced a dramatic rise in the rate of gross capital formation during the nineteenth century. Because of the accounting relationship between gross investment and gross saving, the rise in gross capital formation implies a rise in the saving rate. Figure Ce-E plots Gallman's estimates of gross private saving (GPS), including consumer durables as a percentage of GNP. GPS as a percentage of GNP averaged 15.5 percent for the period 1839–1859. It then jumped to 28.3 percent for the decade 1869–1879. For the 1880s, the average rate was double what Gallman reported for the pre-Civil War period. By the end of the nineteenth century, GPS rates were near one third of GNP.

Particularly puzzling is the substantial jump in the saving rate that occurred during the decade of the Civil War (1860–1868). Ransom and Sutch explain part of the jump by the emancipation of the slaves. Slaves were a component of the wealth of slave owners. Thus, from the point of view of the free population, the growth of the slave population represented a change in net worth and thus a form of saving (Moes 1961; Sutch 1967; Ransom and Sutch 1986b). Using the slave-economy concept of GNP (described in Chapter Ca on national income and product), we can calculate GPS including slave capital. This is also plotted in Figure Ce-E. The emancipation of the slaves without compensation to their owners destroyed this form of wealth. The resulting “asset shortage” generated a temporary increase in the aggregate saving rate until asset stocks were restored to their desired level (Ransom and Sutch

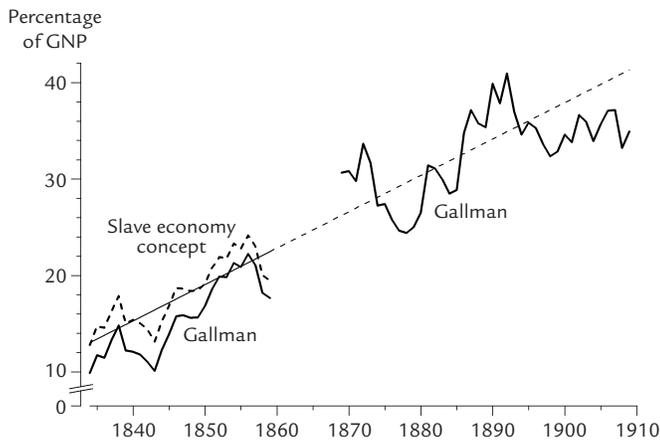


FIGURE Ce-E Gross private saving rate, including consumer durables: 1834–1909

Sources

Gallman, 1834–1859: computed as capital formation excluding inventory changes (series Ca226) minus changes in claims against foreigners (series Ca232) plus durable consumer goods (series Ca224), and then expressed as a percentage of gross national product (GNP) (series Ca219).

Slave economy concept, 1834–1859: computed as capital formation excluding inventory changes (series Ca226) minus changes in claims against foreigners (series Ca232) plus durable consumer goods (series Ca224) plus increase in the stock of slaves (series Ca234), and then expressed as a percentage of GNP under the slave-economy concept (series Ca235).

Gallman, 1869–1909: computed as capital formation (series Ca200) plus durable consumer goods (series Ca198) minus inventory changes (series Ca205) minus changes in claims against foreigners (series Ca206), and then expressed as a percentage of GNP (series Ca193).

1988, pp. 143–9). Figure Ce-E extrapolates (with a straight line) the pre-Civil War trend of GPS augmented by the inclusion of slave capital in the postwar period. This exercise suggests that the unusually high saving rates of the early 1870s may be attributed to the temporarily high saving required to replace the wealth previously represented by the ownership of the slave population.

There is broad agreement that by the end of the nineteenth century the primary reasons for personal saving were a mix of the life-cycle motive to save for retirement and a bequest motive to provide for heirs; however, there is some debate on which motive was stronger (Kotlikoff and Summers 1981; Modigliani 1988; Dynan, Skinner, and Zeldes 2002). What we know is that retirement rates were relatively high for men older than 60 years of age (Ransom and Sutch 1986a; Carter and Sutch 1996), that self-financed and company-sponsored pension plans were widespread (Ransom and Sutch 1987; Ransom, Sutch, and Williamson 1993a, 1993b), and that the dynamic behavior of saving in the early twentieth century was consistent with the life-cycle model of saving (Modigliani 1966; David and Scadding 1974). Franco Modigliani estimates that if one considers the stock of wealth at any point in time, less than one fourth of it was acquired as a result of intergenerational transfer. Thus, more than three fourths was acquired through saving and capital gains (Modigliani 1988, p. 81).

We have no reliable data on capital formation or saving for the period before 1834. There is, however, a presumption that the rate was low before 1815, if for no other reason than that life-cycle saving was likely to be rare at that early date (Ransom and Sutch 2001, pp. 260–4). Saving for future consumption requires the existence of reliable markets. Markets are required for consumption

items as well as for assets because the household's savings must be held in the form of marketable assets that will be sold later to finance the purchase of consumption items. It is doubtful that either asset or consumption markets were sufficiently developed in the eighteenth century to warrant reliance on the life-cycle strategy, especially outside of cities such as Boston, New York, and Philadelphia (Schumacher 1949; Rothenberg 1992). The major asset of the time – land, with its improvements – was encumbered with the restrictions of common law upon sale, partition, or alienation (Bidwell and Falconer 1925; Hughes 1976).

Financial assets did not appear with any great regularity in probate records from 1774 (Jones 1980, pp. 127–34). A longitudinal study of the probate records of Middlesex County, Massachusetts, undertaken by Winifred Rothenberg, revealed that financial assets were only a small fraction of the decedent's wealth in the eighteenth century, but the proportion rose dramatically in the nineteenth century (Rothenberg 1985).

It would appear, then, that there was a sustained rise in saving rates beginning perhaps as early as 1815, and almost certainly before 1834, and that this rise continued throughout the nineteenth century. There is no shortage of competing explanations designed to account for the increase in saving. Paul David has suggested that a rise in the cost of capital was triggered by an increase in the demand for capital produced by the rapid pace of technological change (David 1977). In response, he suggests, the interest rate and the volume of saving rose. Lance Davis, Robert Gallman, and Robert Cull consider that the growth of financial intermediation motivated more people to save and to save more (Davis and Gallman 1973; Davis and Cull 2000). Jeffrey Williamson (1974) has suggested that post-Civil War debt repayment by the government “crowded in” physical investment – just the opposite of the crowding-out effect of government budget deficits. In another place, Williamson (1979) suggested that rising wealth inequality might have increased saving. If the wealthy saved more than the poor, a redistribution from poor to rich would increase saving. Williamson's calculations on the magnitude of this effect, however, indicated that it was likely to be small. John James and Jonathan Skinner proposed a variant of the redistribution argument with a potentially larger impact (James and Skinner 1987). James and Skinner suggest that workers in the trades, manufacturing, and personal and professional services had a much higher propensity to save than did farmers. The relative growth of those high-saving sectors at the expense of the agricultural sector produced the aggregate increase in saving. Frank Lewis (1983) attributes the rise in saving to a fall in the dependency ratio. For a review of this extensive literature, see Davis and Gallman (1994).

What is clear is that, over the course of the nineteenth century, there was a rise in life-cycle-motivated saving. This transition has been called the life-cycle revolution (Sutch 1991) and seems to have been associated with significant and wide-ranging changes in the attitudes and in the economic, demographic, and social behavior of rural Americans (Rothenberg 1992, pp. 119–20; Parkerson 1995; Carter, Ransom, and Sutch 2003, pp. 298–9). Young adults freed themselves from patriarchal control and began to choose their own marriage partners and to time their marriages to suit themselves (Smith 1973; Folbre 1985). Children were sent to school, and less work was expected of them on the farm (Fishlow 1966a, 1966b; Kaestle and Vinovskis 1980). Inheritance patterns changed toward more equality and less sexism (Newell 1986). Fertility fell from the biological maximum of about eight children per woman to fewer

than four children in about two generations (Carter, Ransom, and Sutch 2003). Savings banks arose to collect the assets of savers (Payne and Davis 1956; Olmstead 1976; Steckel 1992).

The shift was toward self-reliance in providing for old age and away from reliance on one's grown children for support in old age. In the eighteenth century, this support was ensured by high fertility, thus producing many children to share the burden, and the threat of disinheritance to compel agreement (Carter, Ransom, and Sutch 2003). A prerequisite for such a change was the development of consumer and financial markets, secure property rights, enforceable contracts, and confidence that the real value of assets (both tangible and financial) would remain secure over a lifetime. The life-cycle strategy also requires a compatible philosophy – a set of values that places the individual over the family line, abhors dependency, and views children with empathy. Adoption of life-cycle strategies of saving and the abandonment of the bequest mechanism would permit parents to give their children much greater freedom – freedom to marry whom and when they choose, and freedom to leave home to take up superior opportunities in other agricultural communities or in the expanding urban sector. The parents would also stand to gain a measure of individual freedom. They no longer would have to look forward to a period of dependency in old age, and their decisions about the disposition of the family farm and other assets would not have to take the wishes of the children into account.

It should not be inferred from the foregoing discussion that the values of individualism and modernization were simply lying dormant in the colonial population waiting to be unleashed by the rise of markets and the removal of restrictions on the sale of land. It is much more likely that the change in values, the rise of asset markets, the restructuring of family responsibilities, the appearance of manufacturing development, and the adoption of life-cycle behavior were phenomena that evolved together. A proximate cause of all of these changes, if indeed a cause should be sought, was the opening of new lands west of the Appalachian Mountains and the resulting flow of population westward.

Although migration into the lands of western New York, western Pennsylvania, and the Ohio River valley was halted temporarily by the 1812–1815 conflict with England, it resumed soon after the war and was greatly stimulated by the fact that many who fought had been paid in part with land script redeemable for western land. This bounty script was transferable, so those who did not wish to move could sell their rights to others. Malcolm Rohrbough offers a useful account of the migration west during this period that is complemented by Hal Barron's study of those who did not migrate (Rohrbough 1978; Barron 1984).

One effect of Jeffersonian land policy was to reduce the value of land everywhere and thus weaken the hold parents could exercise over their children by offering a guaranteed legacy (Barron 1984, pp. 94–7). The terms of the bargain had shifted in favor of children and against their parents. Indeed, the opportunities in the West attracted the young, and many left. Estimates of interregional migration based on calculations by Peter McClelland and Richard Zeckhauser suggest that most young migrants left their parents behind (McClelland and Zeckhauser 1982; Carter, Ransom, and Sutch 2003, p. 298). After the migration had begun, no couple could depend with confidence on their children's continued presence in the community.

One response to this threat was for the parents to view the family farm not as a legacy for the next generation but as ultimate insurance

for their old age. Under the circumstances, parents without grown children living nearby felt free to sell the farm or to lease the land to support themselves. It was even common for the parents to sell the family farm to one of their own children (Barron 1984, pp. 99–100). The bequest motive gave way to the greater exigencies of circumstance. Members of the younger generation, observing and perhaps even precipitating this stress in their parents' generation, were likely to adopt a life-cycle outlook from the outset.

Assets that could be bought and sold became the parents' substitute for a large and captive family. And if the assets accumulated during a lifetime of hard work were needed for the support of the parents when they grew older, there might not remain much of a bequest to pass on to their children. So wealth was transferred between generations when the children were young and their parents alive. Sometimes these gifts took the form of land or other assets, but more often the gift was education. Children were sent to school rather than put to work on farm; the loss in family income was probably significant (Craig 1993). Education may have well increased the desire for independence and heightened awareness of the opportunities that lay elsewhere. Parents permitted grown children to leave the family farm at an early age. In doing this, parents were giving up a great deal because those departing would no longer contribute labor to the parental farm.

There is direct evidence of a change in attitudes motivating saving, wealth holding, and bequests recorded in letters, diaries, and legal documents. For example, the personal recollections of John H. Latrobe regarding the quick sale of Baltimore and Ohio Railroad stock in 1827 contain the following account:

Then came a scene which almost beggars description. By this time public excitement had gone far beyond fever heat and reached the boiling point. Everybody wanted stock. . . . Before a survey had been made – before common sense had been consulted, even, the possession of stock in any quantity was regarded as a provision for old age and great was the scramble to obtain it.

Latrobe's account was set down in 1868. We have taken the quote from Julius Rubin (1960, p. 75). This vignette is typical in that it describes the old-age security motivation for saving as both new and passionate. In this context, it is particularly apt because it links life-cycle behavior directly to the creation of tangible physical capital.

Denison's Law and Twentieth-Century Trends in Private Saving

Private saving, as indicated in Table Ce-A, is the sum of personal saving and saving by corporate businesses. Private saving rates for the twentieth century are known to exhibit no strong trend. Edward Denison (1958) called attention to the remarkable long-term stability of the ratio of GPS to GNP after an examination of data for the years 1948–1956. This phenomenon, known to economists as Denison's law, has been verified with data for a longer period extending back to 1900, first by Franco Modigliani (1966) and later by Paul David and John Scadding (1974). Figure Ce-F displays a three-year moving average of the GPS rate (including consumer durables) for the twentieth century. The rate plotted here is the percentage of GNP that is represented by GPS. Strictly speaking, GNP should be augmented by the flow of services produced by the stock of consumer durables; however, lack of reliable data led us to omit this adjustment.

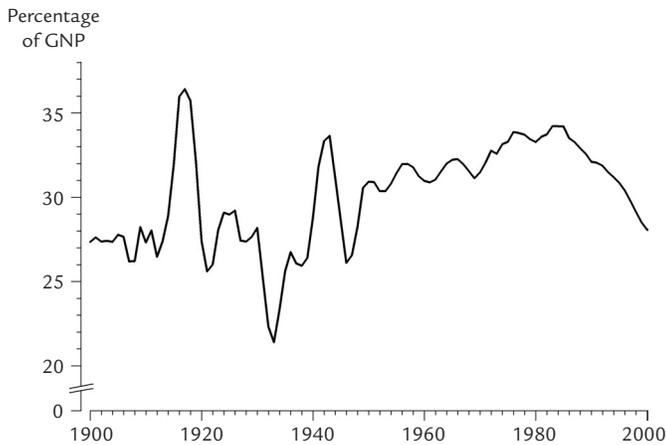


FIGURE Ce-F Gross private saving rate, including consumer durables: 1900–2000

Sources

The gross private saving (GPS) rate plotted is a three-year moving average of GPS (including consumed durables), expressed as a percentage of gross national product (series Ca211). GPS has three components: net private saving (Goldsmith 1955), an estimate of the consumption of capital (except consumer durables) (Kendrick 1961), and an estimate of the consumption of consumer durable capital (Olney 1991). Net private saving is the sum of series Ce3–4 and Ce10, converted to 1929 dollars using Goldsmith's GNP deflator, series T-16(1) (Goldsmith 1955, volume 1, p. 377). Allowances for capital consumption (Bureau of Economic Analysis concept) are from Kendrick, series A-III(2) (Kendrick 1961, pp. 298–9). Allowances for the depreciation of consumer durables are from Olney, series A-12(TOT) (Olney 1991, pp. 266–7).

Private saving rose during the two world wars when consumption was restrained; however, a significant reduction in saving was evident during the Great Depression of the 1930s. Following the postwar recovery, the saving rate seems to trend slowly upward for more than three decades between the late 1940s and the early 1980s. Robert Mundell (1963) suggested that this trend may, in part, be the result of inflation because the price increases would reduce the real value of financial wealth and induce individuals to restore their lost wealth with a boost in their saving. It may also reflect efforts by households to expand their stock of consumer durables as they increasingly planned to own more than one automobile. Had the denominator of the saving rate displayed here been augmented by the flow of services from consumer durables, the rise in the 1950s would not be so evident. The ratio of the stock of consumer durables to GNP reaches a peak in 1958 (series Ce295 and series Ca2). Since the mid-1980s, the GPS rate has slowly declined. As already suggested, this may, in part, be the result of capital gains in the stock market, which would increase wealth and reduce saving.

Franco Modigliani argued that both the short-term fluctuations and the long-term stability of the saving–income ratio could be explained by the simple version of the life-cycle hypothesis of saving originally proposed by Modigliani and Richard Brumberg (1954, 1980). Paul David and John Scadding noted that the stability of the GPS ratio implies, first, that saving is interest inelastic and, second, that individuals exhibit an ultrarationality that allows them to treat corporate saving as equivalent to personal saving (David and Scadding 1974, pp. 239–40, 243). Both of these observations are consistent with the life-cycle saving hypothesis. This model includes corporate saving in the definition of saving (Modigliani

1966, pp. 184–5, 216; also see Miller and Modigliani 1961) and (in most versions) assumes that the income effect of interest rate changes cancels the substitution effect, leaving GPS insensitive to interest rate movements (Modigliani 1966, 1975).

Estimating National Wealth

In principle, a national balance sheet could be derived by summing similar balance sheets for all sectors in the economy: nonfarm households, agriculture, unincorporated business, corporations, and so forth. The balance sheet of each group in turn would be derived by summing the balance sheets of the constituent units, based as far as possible on a comparable valuation of assets and liabilities. In deriving the national balance sheet, no creditor–debtor or owner–issuer relationships among units are eliminated; for example, the debts of households to corporations appear on one side as assets of corporations and on the other as liabilities of households.

The Federal Reserve calculates balance sheets for three sectors: (1) households and nonprofit institutions, (2) nonfarm/nonfinancial corporate businesses, and (3) nonfarm/noncorporate business. They also prepare (4) a consolidated statement of financial asset holdings by federal, state, and local governments. The asset sides of these statements are reproduced here as Tables Ce127–208.¹ The BEA calculates government ownership of tangible capital (series Ce293–294). The Department of Agriculture publishes the *Balance Sheet of the Farming Sector*, formerly called *The Balance Sheet of Agriculture* (Table Da1312–1322). Missing from this list is a consolidated balance sheet for financial corporations. However, see the balance sheets for banks and other financial institutions provided in Chapter Cj on financial markets and institutions. These estimates fall somewhat short of the goal of a comprehensive summary of the assets, liabilities, and net worth of all transactors in the economy because, for lack of data, obligations among households are not included, and, in the case of corporations with subsidiaries, the balance sheet of the parent company is used, thus eliminating relationships among the subsidiary units. In addition, intangibles such as goodwill and patent rights are excluded from the balance sheet.

Table Ce127–146 presents the asset side of the balance sheet for households. Figure Ce-G plots the trends in net worth, tangible assets, and financial assets since 1945 (evaluated in the prices of 2002). Particularly striking is the rapid growth of stock market equities owned (directly or indirectly) by households. Especially in the 1950s and 1990s, the rapid growth of stock prices generated considerable capital gains. The decline in net worth in 2001 and 2002 was produced by the decline in stock prices in those years.

The expansion of wealth has implications for consumption. When an individual's wealth expands, the individual must either spend that increase while living or pass it on to beneficiaries at death. Even if the original owner refrained from spending the wealth, the individuals who inherit that wealth will spend it. The question of timing is the central issue regarding the impact of an increase in wealth on consumption. Estimates of the wealth effect have ranged widely, partly because of the difficulty in pinning down the timing, which might be thought to vary with the distribution

¹ See Board of Governors of the Federal Reserve System, *Guide to the Flow of Funds Accounts*, 1993, for a full description.

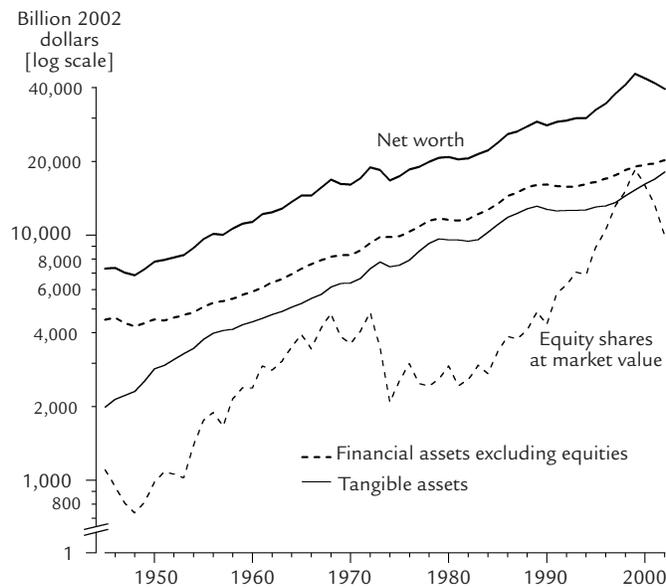


FIGURE Ce-G Net worth and asset holdings of households and nonprofit organizations: 1945–2002

Sources

Net worth: series Ce127. Tangible assets: series Ce129. Equity shares at market value: series Ce133. Financial assets excluding equities: series Ce130 minus series Ce133. Values were converted to 2002 dollars using the consumer price index for urban workers (series Cc1 extended to 2002 using data from the Internet site of the Bureau of Labor Statistics).

of asset ownership, consumer confidence, the demographic composition of wealth owners, and other factors, and partly because wealth is so unequally distributed that the behavior of the extremely wealthy is likely to dominate the results. See James Poterba (2000) for a review of these issues. Information on the distribution of wealth can be found in Chapter Be on economic inequality and poverty.

When all creditor–debtor relationships are canceled, the national balance sheet reduces to a national wealth statement. National wealth consists of reproducible tangible assets, land and natural resources, and net foreign assets. From a strict accounting standpoint, the value of slaves would also be a component of national wealth for the period before 1863 when slavery was legal. The category of reproducible tangible assets consists of physical capital including structures, equipment, and livestock; inventories of durable goods; and monetary stocks of gold and silver. In principle, inventories of perishable goods should also be included; however, reliable data on these holdings by households are not available.

Total national wealth will be less than the total of all assets in the national balance sheet. For example, in the balance sheet the net worth for a corporation is added to the net worth of the stockholders. In the national wealth statement, however, they are consolidated. That is, the outstanding stock of the corporation is canceled against the holdings of the owners, leaving only the net worth of the stockholders and the undistributed earnings of the corporations.

Raymond Goldsmith has estimated national wealth for selected years, using the “perpetual inventory method.” The stocks of tangible assets in existence at a given point in time is estimated from annual output totals extending back over a period equal to the average life of the asset, the output total for every year being depreciated

to the end of the period, and the results summed. Military assets are excluded from Goldsmith’s estimates (see Tables Ce209–280).

The BEA has made annual estimates of fixed, reproducible tangible wealth beginning in 1925 with details provided for (1) residential capital, (2) fixed nonresidential business capital, (3) consumer durable goods, and (4) stocks of business inventories (see Tables Ce281–310). As with Goldsmith, the BEA estimates for structures, equipment, and consumer durables are computed by the perpetual inventory method, which derives capital stock estimates for a given year by cumulating past investment and deducting the cumulated value of the investment that is used up. The data used to implement this method are taken from the NIPA from 1929 onward and from various private studies prior to that time. The series published here represent just one of a number of variants of capital stock estimates made by BEA reflecting different valuations, service lives, and depreciation techniques (see source for additional estimates). Martha Olney has published alternative estimates for consumer durables that extend back in some cases to 1869 (see Table Cd411–423).

The stocks of business inventories estimated by the BEA were calculated by cumulating the annual inventory changes, in book values and in constant prices, respectively, that are estimated in the NIPA. An estimate of the level of each book value and constant price series was made for some single benchmark point in time for which appropriate data were available; that stock was then moved forward through time by adding the estimated annual changes and backward through time by subtracting annual changes.

Estimates of the national stock of land (in acres) are available in Tables Cf101–144.

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