am delighted to be here today—my first trip to Omaha since coming to the St. Louis Fed in 1998. My subject is an important, and puzzling, one. The puzzle is nicely illustrated by recent newspaper stories reporting that the U.S. saving rate is at the lowest level in 73 years—that is, since 1933, the bleakest year of the Great Depression. But let me ask five questions: Are there signs of distress all around, as there were 73 years ago? Has there been a tremendous surge of bankruptcies? Has the United States become a nation of profligate spenders? Are the data wrong? Are the data screwy?

My answers to these five questions are no, no, no, no and no. But there are some puzzles to explain, and that is what my remarks are about.

As you may be able to tell from these introductory remarks, I am not going to express deep dismay in line with the headline news. Nevertheless, to avoid being misinterpreted, I want to emphasize that my relaxed perspective on national saving today does not imply that individual households have nothing to worry about. Many households would be much better off if they had larger assets and less credit-card debt carrying high interest rates. Many would have a happier and more secure retirement if they consumed less and accumulated more wealth during their working years. But these points were as valid 25 years ago when the personal saving rate was fairly consistently above 6 percent as they are today when the saving rate is negative. Moreover, I think there was a case 25 years ago that the United States as a whole would have been better off if it had saved more, and that is equally true today. The reality has changed far, far less than the headlines suggest.

Before proceeding, I want to emphasize that the views I express here are mine and do not necessarily reflect official positions of the Federal Reserve System. I thank my colleagues at the Federal Reserve Bank of St. Louis for their comments. Robert H. Rasche, senior vice president and director of Research, and Massimo Guidolin, assistant vice president, provided special assistance. I retain full responsibility for errors.

HEADLINE GRABBING DATA

Within the past year the personal saving ratio, which is reported every month, has turned negative (Figure 1A), and these monthly data releases have yielded headlines all along the way. Monthly data on household debt service payments as a percent of personal income have reached all time highs (Figure 1B). The federal government is running a large budget deficit (Figure 1C), and the U.S. net international investment position (Figure 1D) is now reported as a negative net position in excess of 20 percent of GDP. Reports in the financial press discuss the rapid accumulation of foreign exchange reserves by China, held mostly in U.S. dollars, and speculate on the impact on U.S. interest rates and the dollar exchange rate should the Chinese choose to diversify a significant fraction of such holdings out of dollars. Personal financial advisers and others frequently are quoted as forecasting that the “boomers” are ill prepared to finance their retirement years.¹

Such headline news alarms some readers and indeed can promote a general feeling of unease about the future standard of living of U.S. citizens. The news reminds me of the chorus of an old song from my youth:

You load sixteen tons, and what do you get?  
Another day older and deeper in debt.  
Saint Peter, don’t you call me ‘cause I can’t go;  
I owe my soul to the company store.\(^2\)

However, there is a “rest of the story.” My purpose today is to discuss some of the definitions that are used to generate the saving data featured in the headlines, to outline some of the basic insights of the theories that economists have come to rely upon to explain the savings behavior of consumers, and then present some additional data relevant to those theories that suggest a vastly different perspective.

THE DEFINITIONS BEHIND THE HEADLINE NEWS

I begin with the critical distinction between saving and savings. Economists are often a bit sloppy, in my view, in how they use these two words and headline writers may not appreciate the importance of the distinction. Saving is the

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\(^2\) Written by Merle Travis, 1947.
flow of after-tax income not consumed. Roughly speaking, saving is the part of your monthly paycheck that is left over after paying all your bills. You may use your saving to pay down debt or add to your assets. Savings, with the “s” on the end, is the stock of wealth you have accumulated—your net worth calculated by taking the value of all the assets you own and subtracting your liabilities. Saving is a flow, savings is an accumulated stock. The distinction between saving and savings is as elementary and as important as the distinction between a company’s income statement and its balance sheet.

For the economist, the basic definition of household income in a particular year is consumption plus the change in net worth. The saving rate is then income minus consumption as a percentage of income. The issue is simple when the setting is simple. Suppose you have an annual salary income of $100,000 and your only asset is a bank deposit bearing no interest. If, over the course of the year, you spend $95,000 on consumption goods, then your saving is $5,000, which shows up as an increase in your bank deposit. We can think of your income as the salary of $100,000, or as your consumption of $95,000 plus the increase of $5,000 in your net worth. The two different approaches yield the same answer. Your saving of $5,000 yields a saving rate of 5 percent.

If you had consumed goods worth $105,000, you would have had to draw down your bank account or borrow. In either case, your net worth would have declined by $5,000. Your income was still $100,000, whether calculated directly from your salary or from your consumption plus the change in your net worth. Your saving rate would have been minus 5 percent.

The issue becomes much more complicated when your assets can change in price, yielding capital gains or losses. As we will see, that is much of what the saving rate issue is all about.

The underlying data of the headline news are mostly derived from our National Income and Product Accounts—the NIPA. These are flow accounts, constructed by the Bureau of Economic Analysis (BEA), designed to measure the current production of goods and services in some particular period, such as a year. The BEA defines personal saving as the difference between current personal outlays and current disposable personal income. The saving rate is saving as a percentage of disposable income.

The NIPA framework is that of a double-entry accounting system. By construction, gross national product is equal to gross national income. Consider the value of a company’s output. Its revenue from sales is the value of the production. The revenue is then distributed as income to employees, dividends to shareholders and retained earnings, or undistributed corporate income. Of course, the tax collectors get some too, and it shows up in the NIPA as government revenue. By definition, the total value of the product equals the total value of the income to various income recipients.

The NIPA focus on both expenditure and income flows has the potential to create accounting discrepancies because the data are collected from different data sources. Income data are collected from payroll data, IRS filings, corporate tax reports and the like. Personal outlays are almost entirely personal consumption expenditures. The dollar value of these expenditures is the value of the goods and services companies sell to households. The more reliable data are those from the demand (expenditure) side of the national accounts. Income data are notoriously imprecise, and they fail to add up to aggregate GDP by as much as 2 to 3 percent. This difference appears in the NIPA as an account called “statistical discrepancy.” If income data are typically underestimated, the NIPA saving rate will also be underestimated. In any event, we know that the saving rate is subject to substantial measurement error and to frequent major revisions.

These observations are meant to help understand the measurement issue, but they do not resolve the apparent mystery of why the saving rate has become negative. The statistical discrepancy in the NIPA has not been growing over time. A number of other issues I’ll flag do not solve the mystery either, because the measurement errors do not seem to be changing enough over time to account for the change in the saving rate. Never-
theless, I’ll go through some of the more important issues.

A number of statistical and measurement issues have been debated in the literature on the evolution of the U.S. saving rate. I will focus on five distinct issues that may cause the measured NIPA saving rate to substantially differ from a true, unobserved personal saving rate.

The NIPA Saving Rate and Realized Capital Gains

Gross domestic income is designed to measure income generated by current production. Personal income goes to households and includes wages, salaries, rents, royalties, dividends and interest. These are all income flows derived from current production of goods and services. Disposable income is personal income less direct taxes, which include income taxes, Social Security taxes and the like.

All transactions involving exchange of existing assets, however, are excluded from measured income because such transactions do not have an associated production of goods or services. If a household consumption unit considers any such capital gains or losses as income, then the NIPA framework underestimates the saving rate as perceived by households. And, I might add, it is perfectly sensible for a household to consider capital gains to be income available to be spent on consumption goods.

Here is one problem: Capital gains taxes are considered direct taxes and subtracted from personal income in calculating disposable personal income. Thus, capital gains income is not counted, but tax paid as a result of realized capital gains is counted. In an environment where there are aggregate taxable capital gains, the NIPA saving rate underestimates the true saving rate as seen by households.

The capital gains issue has grown, and not just because stock market gains have often been substantial in recent years. A company can throw off cash to investors either through paying dividends, which appear in personal income, or through share repurchases. Share repurchases tend to increase stock prices, yielding capital gains to shareholders which do not appear in personal income. If companies have increasingly used share repurchases instead of dividends—which appears to me to be the case—the result would be to create a downward bias to the measured saving rate.

NIPA Saving Rate and Pension Plans

The NIPA treat contributions to defined contribution pension plans, whether made by employees or by employers on their behalf, as disposable personal income at the time such contributions are made. Investment income on these accounts is also accrued as disposable personal income. Investment income consists of interest and dividend earnings. Payments from such funds are not counted as current income, but treated as an exchange of one financial asset—pension accumulations—for another—cash. While not completely clear, consistency suggests that the unrealized capital gains accrued by defined contribution pension plans are not counted as income, nor is the realization of such gains in benefit payments counted as retirement income.

Defined benefit plans are treated similarly to defined contribution plans. Employer contributions to such plans and the investment income accruing are counted as personal disposable income. The administrative expenses of such plans are included in personal consumption expenditures. Again, benefit payments are excluded from personal disposable income. At one point, government sector defined benefit pension plans were treated differently from private sector defined benefit plans. That asymmetry has now been changed and the above treatment is applied to all defined benefit plans.

Note that this treatment of defined benefit plans can generate issues in the timing of income

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and saving since at any point in time such plans can be under- or overfunded. Underfunding, and subsequent “catch-up” payments, defers the recording of income. Overfunding resulting from capital gains on the investment portfolio can produce temporary or permanent understatement of income from such plans.

While payments out of defined contribution and defined benefit pension plans are not counted as personal income, such payments are subject to income tax. These tax payments reduce measured personal disposable income and the saving rate at the time that the retirement benefits are paid. The logic of this treatment in the NIPA is that personal income is recognized when the retirement plan contributions are earned rather than when the benefits are paid, often many years after being earned.

Employers make investment decisions for defined benefit plans and retain investment risk. Given this fact, an alternative approach, not used in the NIPA accounts, would be, first, to remove employer contributions as well as rental income, dividends and interest accruing to such plans from personal income and, second, remove administrative expenses from personal outlays. Then, third, under this alternative treatment, the benefits paid out by defined benefit plans would be added to personal income. Experiments with these adjustments show that the impact on the measured saving rate is minor, in part because of the decreasing importance of defined benefit pensions in the private sector in recent decades.5

**NIPA Saving Rate and Stock Options**

Stock options are a form of deferred compensation to employees. At the time they are granted, they are not treated as generating income for the employee, nor do they produce a charge against profit and loss for the employer. At the time that nonqualified stock options are exercised, the difference between the market price and the exercise price of the option is reported as capital gain on the employee’s income tax return and the employer receives a tax deduction for this same difference.6 In principle the exercise of a nonqualified stock option generates income that is reported for purposes of assessing unemployment insurance taxes. Since reported unemployment insurance wage and salary income are the basic data used to construct compensation in the NIPA, taxable option income likely is included in personal income. However, income from nontaxable incentive stock options does not get included in personal income.

### NIPA Saving Rate and Deferred Compensation

Increasing use of deferred compensation can, in principle, bias the NIPA saving rate downward. Compensation is accrued in national income at the time it is earned. However, it is only recorded in Personal Income at the time that it is received. Growing deferred compensation would lead to an increasing discrepancy between accrued compensation and received compensation. If households determine their consumption patterns on the basis of earned compensation (whether or not it is received) then the measured saving rate is biased downward. However, since 1959 wage accruals less disbursements as recorded in the NIPA accounts have never been more than 0.3 percent of personal income, so deferred compensation cannot have made a significant contribution to the negative trend in the saving rate.7

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6 Some stock options (incentive stock options) do not result in a tax liability to the employee or a tax deduction for the employer. It is believed that nonqualified stock options are the most prevalent form. For a detailed discussion of the treatment of stock options in the NIPA see Carol Moylan, “Treatment of Employee Stock Options in the U.S. National Income Accounts,” Bureau of Economic Analysis, U.S. Department of Commerce (undated).

NIPA Saving Rate and Purchases of Consumer Durable Goods

The accumulation of reproducible capital goods purchased by households is not treated symmetrically in the NIPA. Purchases of newly constructed houses are considered in the NIPA as an investment activity, not a consumption expenditure at the time of purchase. Houses are treated as assets that generate housing services or rental income and depreciate over time regardless of whether the units are owner-occupied or are owned by a rental business. Consequently, over the useful life of the house owner-occupiers are treated as if they are both landlords and tenants renting the property from themselves. An imputation is made for rent from the owner-occupied unit, based on market data from comparable rental units. This imputed rent is included in personal consumption expenditures for each period. On the income side of the accounts this imputation is included in rental income.

In principle, the accounting applied to houses should apply to all purchases of durable goods by households, including automobiles, household appliances, electronic equipment and so forth. In practice consumer durables purchases are treated like food purchases—a current outlay that is quickly consumed. Thus, in the NIPA purchases of newly produced consumer durables are included in entirety at the time of purchase, rather than imputing a flow of services from the assets over their useful lives. If cars, for example, were treated like a house in the NIPA, the consumption entry would be imputed transportation services, including depreciation, from cars rather than the amount spent on the car itself at time of purchase.

Estimates of the household saving rate that treat purchase of consumer durable goods as consumption have been constructed. These alternative estimates show a higher level of the saving rate and different behavior of the saving rate over business cycles. However, the negative trend observed in the NIPA saving rate over the past 10 to 15 years is evident in this alternative measure.

A LITTLE BIT OF CONSUMPTION THEORY

The foundations of modern economic theory of household consumption behavior were established a half century ago. The pioneering work in this field was done in the 1950s and early 1960s by Milton Friedman and by Franco Modigliani and coauthors. The common starting point for these theories is that households derive utility, or satisfaction, from their consumption over multiple periods. The theoretical concept of consumption includes the flow of services from consumer durables, not the expenditures on durables measured in the NIPA. In Modigliani’s formulation, the multiple periods span the lifetime of the household and encompass both working years and a period of retirement. The motivation assigned to households is to maximize the utility derived from consumption over the multi-period horizon. Under this assumption, households smooth their consumption over time. Faced with fluctuations in income, households use borrowing, saving, and wealth accumulation as the tools by which they achieve the desired time profile of consumption. In this framework, the principal determinant of consumption is not current personal disposable income, but rather household net worth.

Ando and Modigliani show that this theoretical framework can be used to derive hypotheses about aggregate household consumption and

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household net worth accumulation. In particular, they conclude that, with a stable age distribution of the population and continuing productivity growth, over time household net worth should tend to grow at a constant rate.\(^{10}\)

**ANOTHER STORY:**
**EVIDENCE FROM THE FLOW OF FUNDS ACCOUNTS**

The flow of funds accounts published by the Board of Governors are another source of data on personal saving and household wealth accumulation. The personal saving concept in these accounts is conceptually the same as the NIPA measure, but because different source data are used, the numbers are not identical.\(^{11}\) From the flow of funds accounts it is possible to construct another concept of personal income and consumption, and hence saving, that treats expenditures on consumer durables as investment and measures consumption as a flow of services, as suggested by theories of consumption behavior.

Yet another perspective is available from the balance sheet data in the flow of funds accounts. End-of-year balance sheets for the household (and nonprofit institution) sector are available from 1946. End-of-quarter balance sheets are available beginning in 1952. These tables contain estimates of reproducible assets, financial assets, liabilities and net worth for the various sectors.\(^{12}\) Market values are used for housing assets and corporate equity in these accounts, though holdings of bonds are reported at face value. Thus, the changes in household net worth measured in these accounts include capital gains/losses on both houses and equities.

Raymond Goldsmith also constructed estimates of net worth on nonfarm households and nonprofit institutions in his monumental *Study of Saving*.\(^{13}\) These data are available for selected years from 1900 through 1949. Albert Ando and E. Cary Brown extended these data to annual time series from 1929 through 1958.\(^{14}\) Ando and Brown also constructed measures of consumption defined as total personal consumption expenditures, less personal consumption expenditures on durable goods plus depreciation of the stock of durable goods valued at replacement cost.\(^{15}\) Since the stock of consumer durable goods recorded in the flow of funds accounts is measured at replacement cost, a comparable series for annual consumption can be constructed by subtracting the annual change in the flow of funds measure of the stock of consumer durables from the annual NIPA total personal consumption expenditure measure. The time series of these measures of annual consumption to end-of-year household net worth are shown in Figure 2 on an annual and five-year average basis. The behavior of these time series is quite consistent with the theory that consumption should be proportional to net worth. There are small fluctuations in the series from year to year that largely average out over five years. The notable exceptions are during the Great Depression and during the second half of the 1990s when household net worth changed rapidly with major stock market fluctuations.

The annual percentage change in both the Ando-Brown and the flow of funds series, less the December-to-December rate of CPI inflation

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\(^{10}\) See Ando and Modigliani, footnote 30, equation (b), p. 77.


\(^{12}\) For annual data, see Table B-100.


**Figure 2**

**Consumption–Household Net Worth Ratio**

![Graph showing consumption to household net worth ratio.]

- C.NW(CMC)  
- C.NW(FoF)  
- 5 Year Average(CMC)  
- 5 Year Average(FoF)

**Figure 3**

**Growth of Household Net Worth Less CPI Inflation**

![Graph showing growth of household net worth.]

- Average CMC (3.0%)  
- Real Net Worth Growth Rate (CMC)  
- Average FoF (3.6%)  
- Real Net Worth Growth Rate (FoF)
is shown in Figure 3. These series measure the real (i.e. inflation adjusted) rate of change of household net worth. Both series are quite volatile. However, neither series exhibits a trend, and the means of the series are quite close. The mean real growth of household net worth from 1929 through 1958 is 3.0 percent. The mean real growth of the flow of funds measure of household net worth from 1946 through 2005 is 3.6 percent. Again, the data are consistent with the broad implications of the received economic theory on the determinants of aggregate consumption.

There is not uniform agreement among economists that increases in net worth generated by capital gains should be considered saving. Some argue that the relevant capital gains are those generated by increased productivity of the underlying asset, and capital gains that do not contribute to increased future income should not be treated as saving. Of course, there is no obvious way to separate observed capital gains into those generated by higher productivity of capital and those that could result from changes in tastes or risk premiums. There is now general agreement among economists that a significant increase in trend productivity occurred in the U.S. economy starting around the mid 1990s. A major stock market boom occurred in the late 1990s.

Over most of the post-World War II period, the personal saving rate averaged about 6 percent, with some higher years from the mid-1970s to mid-1980s. The negative trend in the NIPA saving rate started in the mid-1990s, about the same time the stock market boom started. Thus it is hard to dismiss the hypothesis that the decline in the measured saving rate in the late 1990s reflected the response of consumption to large capital gains from corporate equity. Evidence from panel data of households also supports the conclusion that the decline in the personal saving rate since 1984 is largely a consequence of capital gains on corporate equities.16

As is well known, the stock market boom collapsed in 2001, and equity prices are only now returning to the previous peak levels. Subsequent to the stock market boom, however, there was a major housing boom in the United States both in terms of construction and property values. It is more problematic to argue that the recent growth in household net worth, supported by capital gains in housing, reflects improved productivity trends. Nevertheless, in the past several years, consumption demand appears to have responded to the capital gains in housing. There is substantial evidence of “equity extraction” by homeowners during the recent housing boom, and cross-section evidence of large responses of consumption by some groups of households to increases in house values.17

As an alternative measure of the saving rate, we can consider the ratio of the change in household net worth from the flow of funds accounts to the NIPA measure of personal disposable income. The annual and five-year average data for this series are shown in Figure 4. Year to year, the movements are quite volatile, but the negative trend characteristic of the headline saving rate is not present. Indeed, in the late 1990s this ratio jumped up, reflecting large capital gains on corporate equities, fell in 2000-2001 reflecting the end of the stock market boom, but has moved above its long-term average in 2003-2005.

**CAPITAL GAINS AND LONG-TERM REAL INTEREST RATES**

The evidence presented above suggests that the behavior of aggregate consumption in the United States relative to household net worth over the past two decades is consistent with long-

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established patterns. Thus, most of the observed negative trend in the NIPA saving rate seems to be attributable to the omission of capital gains and losses from measured personal disposable income. The evidence suggests that it is not a coincidence that increases in household wealth and a long-term downward trend in the NIPA saving rate have occurred together. Increases in household wealth have been driven by increases in stock prices after 1982, albeit with some significant fluctuations, and by the more recent increase in home values after 2001.

This observation, however, leaves a question: Why have we observed such high capital gains on corporate equities and housing? Part of the story is the substantial decline in inflation and greater confidence in sustained low inflation after 1982. At that time, also, changes in tax and other policies contributed to higher economic growth and increases in corporate profits, which have been growing most years since 1982. But another part of the story may be a downward trend in real interest rates since the late 1990s. Declining real interest rates increase asset values.

Recent yields on indexed bonds both in the United States and globally appear very low, relative to the conventional wisdom on the historical behavior of real yields. With the exception of the United Kingdom, where indexed bonds were introduced in the early 1980s, markets in inflation indexed debt are relatively new. The U.S. Treasury started issuing such securities in 1997. The French introduced a bond that is denominated in Euros and indexed to the Euro area harmonized CPI inflation in 2002. For the past four years, the real yield on these bonds has fluctuated around two percent or slightly higher.

To infer the behavior of U.S. real yields since the early 1990s, we can use U.K. indexed bond data and assume that U.S. yields have moved in similar fashion or we can use U.S. data that are constructed from survey measures of inflation expectations. Such data are shown in Figure 5. The first series shown there is the 10-year Treasury constant maturity yield less the 10-year inflation expectation reported in the Survey of Professional Forecasters.\(^\text{18}\) The second series is the monthly average yield on the 10-year U.K. indexed bond for the middle month of each quarter. The third series is the monthly average 10-year constant maturity Treasury yield, again for the middle month of each quarter.\(^\text{19}\) The series inferred from the Survey of Professional Forecasters is quite consistent with the market yield on the indexed bond for the periods where both series are available.

These data suggest that a significant decline in long-term real interest rates started in the early 1990s, when the estimated real yield averaged around 3.5 percent. More recently, the average real yield has been around 2 percent. This negative trend is also visible in the U.K. indexed yield, which declined rapidly in the late 1990s from around 3.5 percent to 2 percent or below in recent years. A decline in global real rates of this size, if expected to be permanent, should produce a major upward revaluation of the value of long-lived assets such as corporate equities and housing. Hence the explanation of the observed trend in the conventional saving rate in the U.S. can likely be traced, in considerable part, to global changes in real rates of interest.

Where do these observations leave us? I’ll offer two tentative conclusions. First, household saving behavior does not seem to have changed in any fundamental way. What has changed to a degree is the trend in asset values. Households have consumed some of the increase in asset values in about the same way they always have.

My second tentative conclusion is that the behavior of households, though perfectly sensible and responsible for households as a whole, has led to a situation in which the United States as a whole is saving too little of its national out-

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\(^\text{18}\) The Survey of Professional Forecasters data are collected once a quarter by the Federal Reserve Bank of Philadelphia. The data are available since November 1991. The data plotted are the monthly average 10-year constant maturity Treasury yield for the middle month of each quarter less the 10-year inflation expectation reported in the SPF.

\(^\text{19}\) Though indexed Treasuries were first issued in 1997, the 10-year constant maturity yield is constructed only since 2002.
Figure 4
Changes in Household Net Worth Relative to Personal Disposable Income

Figure 5
10-Year Real Interest Rate Measures
put. U.S. domestic investment has not suffered, because capital has been flowing into the United States from abroad. However, at some point the U.S. net international investment position will stop becoming ever more negative. U.S. saving will then finance a larger fraction of U.S. domestic investment and, perhaps, repurchase some U.S. assets now held by international investors. There is no reason why this adjustment should be difficult or disorderly, but it will require that U.S. consumption outlays expand more slowly than U.S. GDP for a time.