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# SAVING PUZZLES AND SAVING POLICIES IN THE UNITED STATES

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*In the past two decades the widely reported personal saving rate in the United States has dropped from double digits to below zero. First, we attempt to account for the decline in the National Income and Product Accounts (NIPA) saving rate. The macroeconomic literature suggests that 40–50 per cent of the drop since 1988 can be attributed to households spending stock-market capital gains. Another 30 per cent is accounting transfers from personal saving into government and corporate saving because of the way pensions and capital gains taxes are treated in the NIPA. Second, while NIPA saving measures are well suited to measuring the supply of new funds for investment and capital accumulation, it is not clear that they should be the target of government saving policies. Finally, we emphasize that the NIPA saving rate is not useful in judging whether households are preparing for retirement or other contingencies. Many households have accumulated significant wealth, primarily through retirement saving vehicles and capital gains, even as the saving rate slid. There remains a segment of the population who save little and whose behaviour appears untouched either by the stock-market boom or the slide in personal saving. We explore reasons and policy options for their puzzlingly low saving rate.*

## I. INTRODUCTION

In the past two decades, the personal saving rate in the United States has experienced an untimely demise. From 10.6 per cent of disposable personal

income in 1984 it dropped to –1 per cent in January 2001, a puzzling and sharp drop. There is considerable debate over the reasons for the decline, as well as about its importance. A wealth effect arising from stock-market capital gains has been the pri-

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mary suspect, but even this explanation has not been supported unanimously (e.g. Poterba and Samwick, 1995; Parker, 1999; Hassett, 2000). Some view the decline in personal saving as a harbinger of future financial distress (Bryant, 2001), while others have suggested that the focus on National Income and Product Accounts (NIPA) personal saving is too narrow and ignores important components of saving such as capital gains, education, and durables (Gale and Sabelhaus, 2000, and others).

In this paper, we make three general observations about the decline in the saving rate. The first is that stock-market capital gains *are* driving down the measured rate of personal saving. One pathway is the conventional wealth effect in which capital gains lead households to consume more. Since stock-market capital gains do not appear in NIPA income, the net effect of stock-market wealth is to reduce NIPA saving (the difference between after-tax income and consumption). Macroeconomic estimates from the literature, while exhibiting wide variation, suggest that appreciating stock-market wealth since 1988 has reduced personal saving by between 3.4 and 4.6 percentage points, or between two-fifths and one-half of the total decline in personal saving since that time.

There is another pathway as well. Even without any change in spending behaviour on the part of consumers, personal saving in the NIPA will tend to fall in the presence of capital gains. For example, in past years defined benefit (DB) plans were an important source of household saving, but with the burgeoning stock market, they have become a drag on household saving. The appreciating stock in pension funds restricts firm-level contributions (and NIPA personal income). Since DB retirement benefits are largely spent, but are not counted as income, the secular increase in DB benefits that are largely consumed also tends to drive down measured saving rates.<sup>2</sup> By the same token, growing capital gains tax revenue reduces disposable income and hence saving, even if consumption does not change at all (Reinsdorf and Perozek, 2000; Peach and Steindel, 2000; Poterba, 2000). We estimate that these accounting effects caused up to a 2.4 percentage point

decline in NIPA personal saving since 1988, nearly as large as the conventional stock-market wealth effects.

Our second observation focuses on the aggregate implications of the decline in personal saving. For all its shortcomings, NIPA national saving provides a reasonable measure of new funds for investment. Capital gains may make households rich, but they do not directly provide new funds for firms to make investments or soak up government debt.<sup>3</sup> Nor does the purchase of durables provide new funds for physical capital investment. At first glance, therefore, the remarkable decline in personal saving would appear worrisome; if aggregate personal saving is in free fall, can aggregate investment be far behind?

One reason why the precipitous decline in personal saving has not raised more warning bells is because national saving and foreign capital inflows have remained strong. In part, this is because the 2.4 percentage points of personal saving was shifted into government and corporate saving, as noted above. Even so, net national (NIPA) saving, the combination of public, corporate, and personal saving, is higher in 2000 than it was in 1995, and current net investment is stronger now than it was in the 1980s. Should we ramp up saving incentives as a way to raise personal saving, particularly in the event that other sources of saving, such as corporate profits and federal budget surpluses, dry up? As we argue below, the strongest rationale for instituting saving incentives is not to target the aggregate personal saving rate. Given our recent experience, we are uncertain whether corporate, government, and foreign sector saving will continue to offset the decline in household saving, and thus it is not clear to us that any policy targeting aggregate personal saving is warranted.

Our third observation is to emphasize that NIPA personal saving is not a useful measure of whether households are prepared for retirement or an economic downturn. For example, capital gains may have depressed NIPA saving, but they have been a boon to households saving for retirement. In 1999, saving rates that included capital gains were nearly

<sup>2</sup> The increased annuitization of retirement income may have secondary effects on saving; see Gokhale *et al.* (1996).

<sup>3</sup> Stock-market gains may encourage equity financing of firms, but that source of funds is traditionally a small fraction of investment.

40 per cent, in contrast to the 2 per cent rate for the personal saving rate that excluded capital gains. But what about the households who do not own stocks? Has accumulating debt and laggard saving rates worsened their financial position with regard to future retirement?

Despite the strong stock market and burgeoning wealth in retirement programmes, there remains a significant group of households in the United States that do not appear to have adequate resources for adverse economic events or for retirement. We show below that most households hold higher levels of wealth in 1998 than in 1989, but there remains a core of low-wealth households in both years. This raises our second puzzle: neither lower personal saving rates, nor stock-market booms, had any impact on a significant swathe of households who just do not appear to save much of anything.

The appropriate policy approach to this puzzle depends crucially on why saving is so low. If households save little because of high time preference rates or generous retirement benefits, then perhaps there is little additional role for government policy. If, on the other hand, households save little because of a failure to perceive the need to save, inability to plan, financial illiteracy, lack of discipline, or other explanations, one might argue that there is a basis for additional government intervention. For example, saving reforms could include encouraging saving rates among the lowest income groups (those subject to heavy asset-based means testing), and pension reforms could encourage firms to expand pension coverage to uncovered workers.

## II. MEASURING SAVINGS: SOME PRELIMINARIES

The first issue we face in describing empirical facts about household or personal saving is a measurement problem: how do we measure saving? We consider this question at both a theoretical and empirical level.

### *Theoretical measurement of saving*

At a theoretical level, it is straightforward to measure saving. Letting  $W_{it}$  denote wealth for person  $i$  at time  $t$ , then saving  $S_{it}$  is defined as after-tax income

$Y_{it}$  minus consumption  $C_{it}$ , or accounting explicitly for components of  $Y_{it}$ ,

$$S_{it} = r_{it}W_{it-1} + E_{it} + M_{it} - T_{it} - C_{it}$$

where  $r_{it}$  is the individual-specific rate of return (which may or may not include ‘unexpected’ capital gains or losses),  $E_{it}$  are earnings,  $M_{it}$  transfers from the government (plus private pensions),  $T_{it}$  taxes, and  $C_{it}$  consumption.

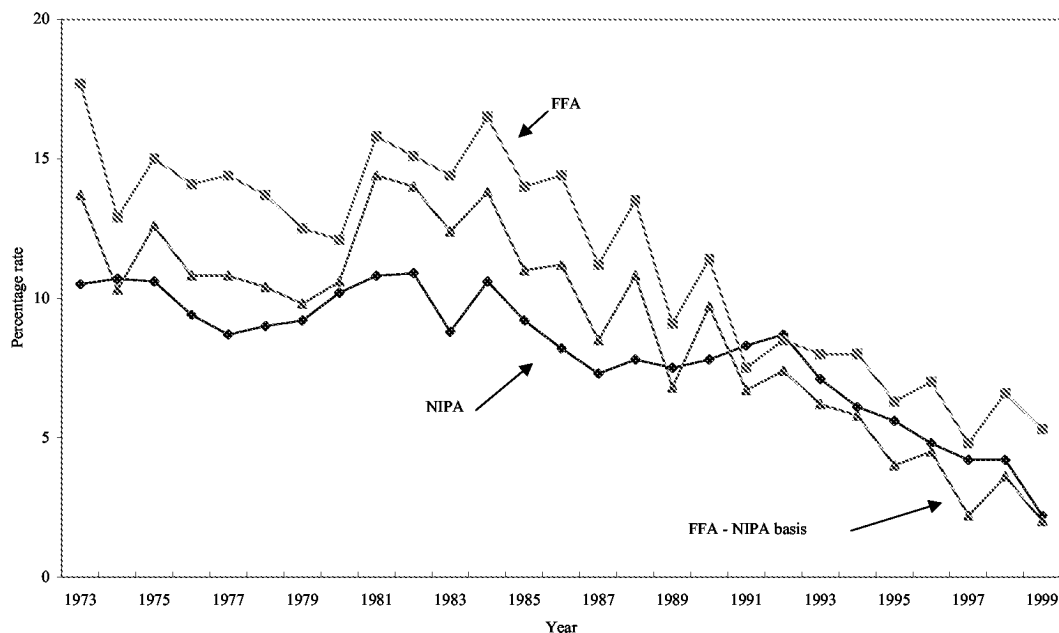
We can use this basic identity to consider how saving measures are constructed at the macroeconomic level. As it turns out, the key assumption has to do with the return on wealth. When constructing household saving from the NIPA accounts,  $r_p$ , aggregated over households, measures a flow of income from assets, such as interest payments on bonds, dividends on stocks, and so forth. For this measure of saving, capital gains are entirely excluded. And this makes sense from the point of view of measuring new loanable funds for saving, since changes in the valuation of stocks or privately held companies do not by themselves free up funds for new investment.

Alternatively, one may allow the return on wealth to reflect capital gains revaluations as well. In this case, both income and saving will tend to be substantially larger during periods of appreciating asset prices, and smaller during downturns. This measure of saving tends to fluctuate considerably with the vagaries of the stock market, and is more informative about how well households are accumulating assets for retirement or other contingencies, as well as their ability to consume in the long term. The real difference between the two measures of saving lies in whether the return on capital includes or excludes capital gains.

### *Empirical measurement of saving*

Three different personal saving rates are regularly calculated and widely reported. The first is the NIPA saving rate assembled by the Bureau of Economic Analysis (BEA) of the Department of Commerce. Roughly speaking, personal saving is the total income less personal consumption outlays and taxes. A second widely reported saving rate is the Flow of Funds Accounts (FFA) compiled by the Federal Reserve Board. This measure is based on

**Figure 1**  
**Reported Saving Rates**



Source: Bureau of Economic Analysis and Federal Reserve Board web sites.

the net acquisition of assets and differs from the NIPA measure in several minor and one major respect: the FFA treat expenditures on consumer durable goods as saving, whereas the NIPA treat them as personal consumption. To facilitate comparisons between the FFA and NIPA measures, the Fed also publishes a third saving rate (FFA – NIPA basis) based on FFA sources but excluding consumer durables.

The three saving rates are shown in Figure 1. All show the same basic trends. In particular, the well-publicized and well-documented downward trend in saving since the mid-1980s is evident in all three series. An even more pronounced decline in the 1990s is also quite clear. In 1999 the saving rates are 2.2 per cent in the NIPA, 5.2 per cent in the FFA, and 2 per cent in the FFA excluding durables. Over the past two decades the NIPA rate averaged 10.2

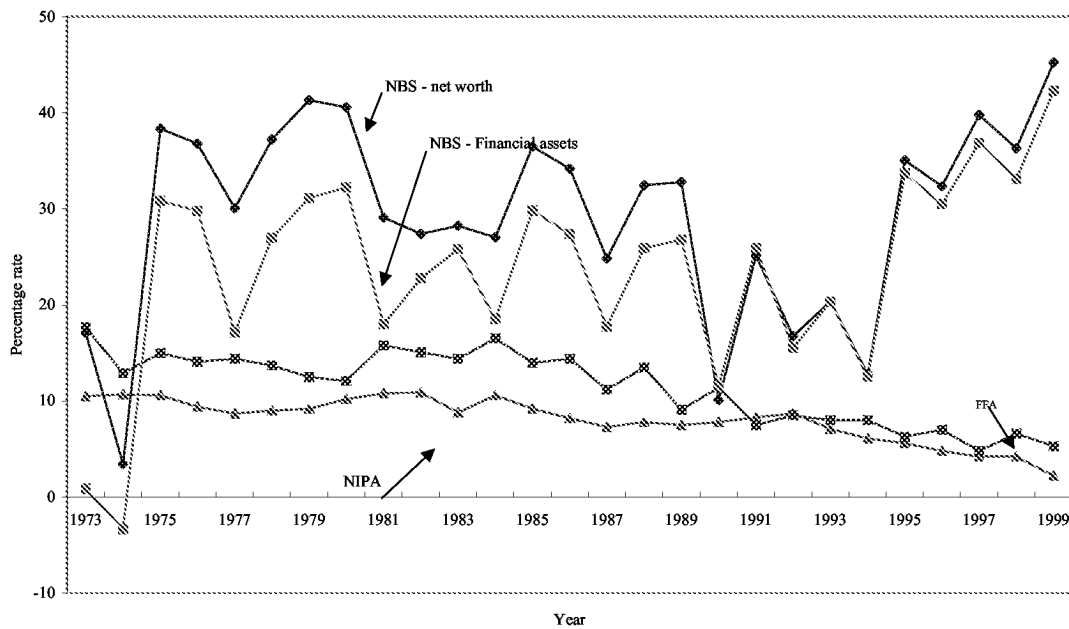
per cent in the first half of the 1980s, and fell to 8 per cent, 7.6 per cent, and 4.2 per cent in the next three 5-year periods. The NIPA saving rate has since fallen to –1 per cent in January 2001. A negative rate had previously been reported in 1998. However, this was under the previous methodology and has since been revised upward.<sup>4</sup>

The NIPA and adjusted FFA measures of saving explicitly exclude capital gains. We can assess the impact of omitted capital gains by constructing an alternative saving measure based on changes in asset balances using the National Balance Sheets (NBS) published by the Federal Reserve Board.<sup>5</sup> The NBS provide estimates of financial and tangible assets valued (for the most part) at market prices. We construct two saving rates based on changes in the market value of wealth. The first constructed measure, labelled NBS—Net Worth, is the change

<sup>4</sup> The BEA periodically undertakes a comprehensive revision of the NIPAs to incorporate methodological improvements. There have been 11 comprehensive revisions, with the two recent revisions having had relatively major effects on personal saving. In 2000 the BEA reclassified contributions to Federal Civilian, Federal Military, and State and Local retirement plans as personal income (affording government pensions the same treatment as private pensions). This change raised personal saving, but decreased government saving by an offsetting amount.

<sup>5</sup> This point has been raised and similar estimates have been provided by many authors including Summers and Carroll (1987), Bradford (1990), Gale and Sabelhaus (1999), and Peach and Steindel (2000). Other variations include adjustment for the treatment of home ownership, correcting for inflation-induced revaluation of nominal assets, and measuring the implicit tax liability in tax-advantaged assets. See Holloway (1989), Seskin and Parker (1998), Gale and Sabelhaus (1999), and Reinsdorf and Perozek (2000).

**Figure 2**  
**NIPA, FFA, and NBS Measures of Saving**



*Source:* Bureau of Economic Analysis and Federal Reserve Board web sites.

in net worth expressed as a percentage of an expanded income measure that adds the capital gains to disposable income. The second, labelled NBS—Financial Assets, is the change in financial assets expressed as a percentage of yet another expanded income measure that augments disposable income with financial capital gains. The two saving rates are shown in Figure 2. Given what we know about the volatility of asset prices, it should not be surprising that these estimates show enormous year-to-year variation. These wealth-based saving rates bear little resemblance to the NIPA and FFA series. In particular, the trends in the 1990s are starkly different. The market wealth measures show a dramatic increase in saving since 1994, peaking at 38 per cent of disposable income in 1999.

### III. HOW MUCH OF THE SAVING DECLINE IS DUE TO THE WEALTH EFFECT?

What have been the effects of these large capital gains? The sharp increase in stock-market wealth has been suggested as one of the main culprits for the decline in (NIPA) saving and much of the media attention has been focused on the stock-market wealth effect on consumption. If we were to super-

impose the Dow Jones Industrial Average (DJIA) Index and the private saving rate, we would find that, indeed, these two series move closely together and in opposite directions. More precisely, the sharp increase in stock prices after 1995 is paired with a precipitous decline in the saving rate. Assessing the importance of the wealth effect is, however, no easy task.

Aggregate estimates, such as those included in the Federal Reserve Board FRB/US model (see Brayton and Tinsley, 1996) indicate that an additional \$1 of stock-market wealth raises the level of aggregate spending by around 3 cents. More recent estimates (see Ludvigson and Steindel, 1999) suggest that the effect of total wealth on consumption is closer to the lower estimate (2 cents for each \$1 of total wealth). The authors also suggest, however, that estimates tend to be different across time periods. This should not surprise us. After all, the stock-market run-up has been concentrated in a short period of time (increases are very steep after 1995), and most aggregate studies have not explicitly modelled the sources of shocks to aggregate wealth, so we expect parameter estimates to vary across specifications and sample periods. Poterba (2000), for example, argues that on basis of lottery experiments, larger gains in wealth trigger proportionately

stronger economic responses than small gains (see also Barberis *et al.*, 2001).

There are reasons, however, to question the aggregate estimates. One reason is that the channel could be 'indirect', i.e. stock prices may simply lead economic activity and forecast an increase in production and employment that will also translate into higher consumer spending.<sup>6</sup> An additional problem with aggregate estimates is that they represent an average across different types of consumers. However, not everyone in the economy is a stock-holder. According to the Federal Reserve Board's Survey of Consumer Finances (SCF), only half of the US population holds stocks, and the top 1 per cent of equity holders accounts for as much as 53 per cent of household holdings of stocks (Poterba, 2000). This has led some observers to question whether the truly wealthy could possibly spend enough of their stock-market gains to make a dent in aggregate saving (Hassett, 2000).

Disaggregated or micro-level data can help to sharpen our understanding of the wealth effects on consumption. Maki and Palumbo (2001) combine data from the Flow of Funds with data from the SCF to examine saving rates and wealth-to-income ratios of selected demographic groups over time. As expected, families in the uppermost 20 per cent of the income distribution experienced the largest increase in net worth-to-income ratios. These same families also decreased their NIPA-equivalent personal saving rates the most, from 8.5 per cent in 1992 to -2.1 per cent in 2000.

While Maki and Palumbo (2001) have shown a link between stock capital gains and saving by making comparisons across income and education groups, they have not shown that stockholders *within* a given income or education group are more likely to increase consumption and reduce saving. Conspicuous consumption of the rich may create imitation effects for the rest of the population. In addition, as Poterba (2000) suggests, the behaviour of the stock market may have buoyed consumer confidence, and this high level of confidence could boost spending among all households and not just among stock-holders (Otoo, 1999).

<sup>6</sup> Lettau and Ludvigson (2000) further note that aggregate studies do not distinguish between transitory and permanent components of the variation in asset wealth. According to their findings, a vast majority of variation in asset wealth is transitory and has no impact on consumer spending.

Dynan and Maki (2000) attempted to disentangle these effects using individual level data from the Consumer Expenditure Survey (CEX) to estimate the effect of stockholder wealth on consumption. They showed that the spending of stockholders was positively related to stock-market returns (while the relationship is negative for non-stockholders) and was stronger when the sample was limited to those with greater stock-holdings. Furthermore, they showed that the households with the largest imputed capital gains also experienced the largest jumps in consumption.

Although the noisiness of the CEX data limited the precision of their estimates, the authors estimate a marginal effect of stock-market wealth on consumption in the range of 2–12 cents.

Rather than measure changes in consumption, Juster *et al.* (1999) study how stock-market wealth is estimated to have caused offsets in 'active saving' defined to be similar to the NIPA household saving measure that excludes capital gains. In the Panel Study of Income Dynamics (PSID), they find very large effects of stock-market capital gains on active saving, with regression estimates as high as 0.17. These results are consistent with the view that, among the upper middle class, stock-market wealth had a large incremental influence on active saving. It should be kept in mind, however, that these regression coefficients are not comparable to macroeconomic aggregate estimates, for two reasons. First, least-squares regression estimates do not necessarily yield estimates of 'average marginal effects'. And, second, the authors' PSID sample is not representative of the true distribution of households owning stock-market wealth.

Other studies using micro data find evidence of more modest effects on consumption. Starr-McCluer (2000) finds that survey respondents in 1997 with large stock holdings were more likely to report that the recent trend in stock prices affected their spending. As one might expect given the skewness in stock holdings, most respondents reported that stock prices had no influence on their spending. Similarly, Parker (1999) estimates that household wealth appreciation could have explained only one-fifth of the

total growth in consumption during the sample period he considered (1984–94). A somewhat different approach is followed by Poterba and Samwick (1995), who examined the link between spending on luxury goods in the NIPA and stock-market fluctuations. They found overall weak effects, but their estimates are based on data that preceded the run-up in stock prices.<sup>7</sup>

While there is considerable uncertainty surrounding the precise value of the marginal propensity to consume (MPC) out of wealth using the microeconomic evidence—particularly since micro-level data typically miss the consumption behaviour of the very wealthy who hold much of the stock-market wealth—the data at the macroeconomic level are reasonably robust, and a measure of 3 cents per dollar of stock-market wealth is not inconsistent with the evidence.

We conjecture how much of the decline in saving since 1988 can be attributed to the traditional wealth effect.

Real stock-market capital gains, calculated by summing Federal Reserve Board measures of capital gains in household corporate equities and mutual funds, adjusted for nominal inflation using the chain-weighted GDP deflator, yield \$7.88 trillion between first-quarter 1988 and fourth-quarter 2000, expressed in 2000 dollars. A 3-cent wealth effect therefore implies a decline in the personal saving rate of 3.4 percentage points, or about two-fifths of the overall decline in saving between 1988 and January 2001.<sup>8</sup> A 4-cent wealth effect implies a 4.6 percent decline in personal saving, or a bit more than half of the decline.

#### IV. HOW MUCH OF THE DECLINE IN PERSONAL SAVING IS AN ACCOUNTING MIRAGE?

Capital gains also work through other channels. In this section, we consider how large levels of capitals gains may influence the accounting definition of personal saving in the NIPA. Under normal circumstances, these influences are small in magnitude and exert only a small influence on measured saving. However, the dramatic swings in capital gains during the latter 1990s have had somewhat perverse effects on measured personal saving.

We first consider the role of retirement accounts. The principle sources of retirement saving are defined benefit (DB) and defined contribution (DC) plans sponsored by employers and personal saving plans such as Individual Retirement Accounts (IRAs). Over the past two decades the ratio of retirement assets (from the FFA) to disposable income (from the NIPA) has risen from 49 per cent in 1980 to 189 per cent in 1999.

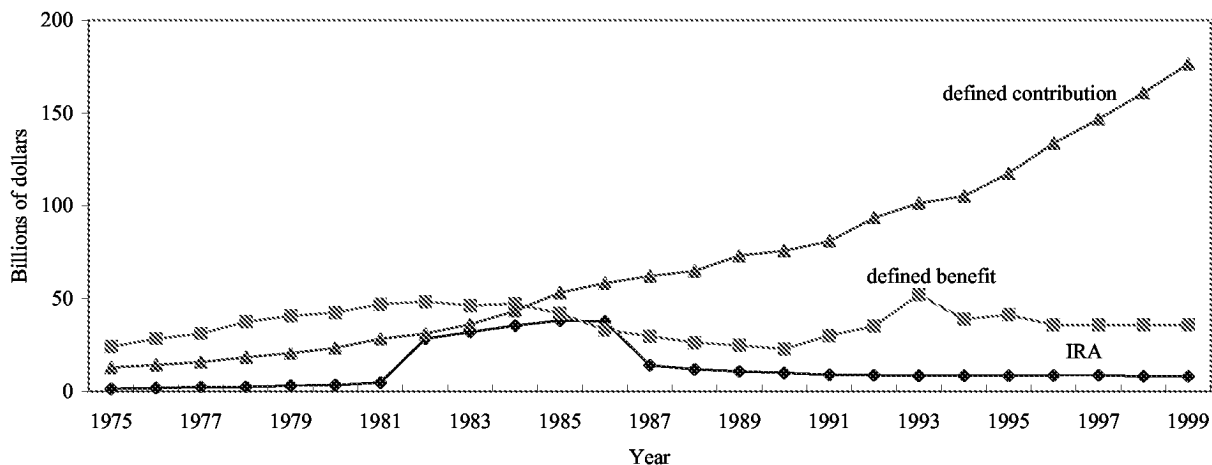
Annual contributions to each of these plans are presented in Figure 3(a) and asset balances are presented in Figure 3(b).<sup>9</sup> The first figure clearly shows the trend away from DB plans. Reasons for this trend include changing industrial composition and changing regulatory climate (see Gustman and Steinmeier, 1992). Of particular relevance are recent federal policies that have effectively linked DB contributions to asset market performance. In 1974 ERISA (Employee Retirement Income Security Act) set minimum funding requirements for DB pensions. When stock and bond prices increased, many firms responded by cutting back on pension

<sup>7</sup> Poterba (2000) notes that there are indications that items such as jewellery and watches and personal boats and planes have increased substantially in the late 1990s. It is not obvious, however, that these changes can explain a large part of the increase in consumption or that they are driven by income rather than stock-market wealth.

<sup>8</sup> Strictly speaking, consumers should value the stock-market gains on an after-tax basis, but since econometric estimates do not correct for tax liabilities, neither do we.

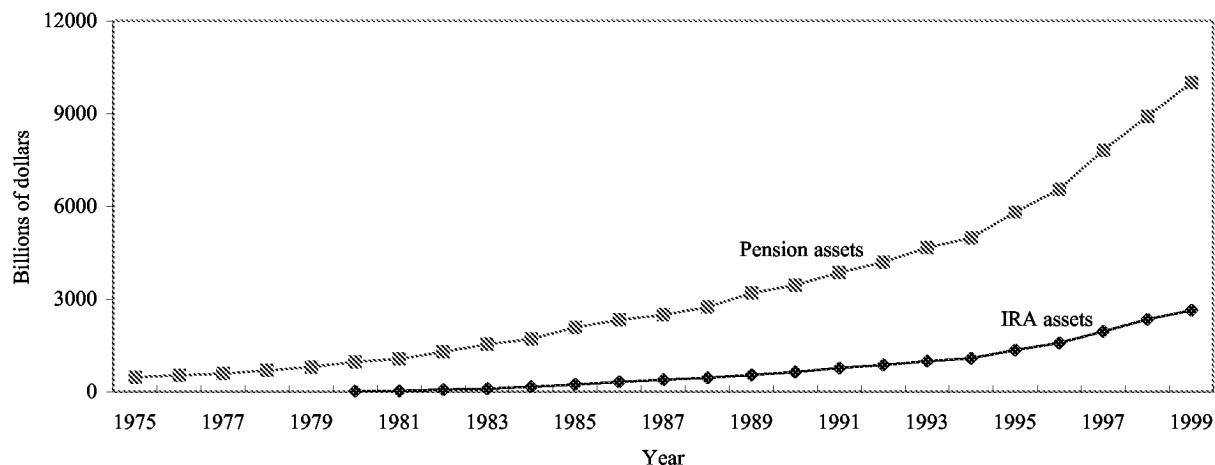
<sup>9</sup> The DC and DB contributions in Figure 3(a) are from Form 5500 filings for private-sector pensions; 1996 is the latest year data are available. DC contributions through 1999 are assumed to grow at 9.7 per cent per year (the average for the 3 years preceding 1997). DB contributions are assumed to remain at their 1996 level (they fell in the 3 years preceding 1997). The apparently anomalous increase in DB contributions in 1993 is the result of a one-time injection of \$15.3 billion by General Motors into its underfunded pension plan. Pension assets in Figure 3(b) are from the FFA data which are available through 1999, but do not provide separate breakdown by DB and DC for all years. The FFA data include both private- and public-sector pensions. IRA contributions in Figure 3(a) include only tax-deductible contributions and ignore contributions from rollovers. The data through 1998 are from the IRS *Statistics of Income*, with an author's estimate for 1999. IRA assets in Figure 3(b) include rollovers and are from Sabelhaus (2000).

**Figure 3**  
**(a) Retirement Contributions**



Source: IRA contributions are from IRS tabulations. Data on DB and DC contributions are from Form 5500 filings. See text for details.

**(b) Retirement Assets**



Source: IRA assets through 1998 are from Sabelhaus (2000). 1999 IRA assets are estimated by assuming the same rate of growth as pensions. Pension assets are from the FFA and include both public and private pensions.

contributions. More recently, the 1987 Omnibus Reconciliation Act redefined ‘full funding’ and limited pension assets to no more than 150 per cent of the legal liability (the balance firms must hold to pay future benefits). Funds up against this ceiling could no longer make tax-deductible contributions to their pension plans. In addition, increases in ‘reversion taxes’ have discouraged firms from offering DB plans and have limited the amount that can be

contributed to them (see Bernheim and Shoven, 1988; Ippolito, 1998).

Figure 3(a) also shows the enormous growth in DC plans. Most of this growth has been in 401(k) plans—so-called voluntary contribution plans—which grew rapidly after 1982. The third component in the figure is contributions to IRA plans. These also grew quickly following a legislative change in

1981, but were curtailed significantly by the Tax Reform Act of 1986. Although tax-deductible contributions to IRAs have remained under \$10 billion per year since 1986, IRA balances continue to grow steadily, in part because of rollovers from employer-based pensions. The asset balances are shown in Figure 3(b). By 1999 private and public pension plans held about \$10 trillion of assets, while IRAs held another \$2.6 trillion. The size of the retirement saving sector doubled between 1994 and 1999, to a large extent because of massive capital gains inside the retirement accounts.

The problems associated with the treatment of retirement savings in the NIPAs run much deeper than simply omitting capital gains.<sup>10</sup> A booming asset market means that, by NIPA conventions, resources flowing into the retirement sector will lag resources flowing out of the sector. To see this, note that the NIPA income components—contributions, interest payments, and dividend earnings—are logged in the year in which income is earned. Distributions (and the resulting NIPA consumption) occur when pension or IRA benefits are paid out. This makes sense from the perspective of an individual: over the first part of the life-cycle a worker diverts some income to savings and, in later years, a worker receives and consumes retiree benefits. Recall that retiree benefits are not a component of NIPA income.

However, funny things happen when this NIPA convention is applied to the cohort of post-war workers who were most likely to hold DB pension plans. In a fully funded system with capital gains, the rate of growth of contributions will be less than the rate of growth of benefits as a large share of benefits will be paid out of the fund's internal accumulation. This alone will drag down the NIPA saving rate. The problem is exacerbated by the host of legal and regulatory restrictions (discussed above) that further depress contributions. If asset prices

are booming, pension plans can, in principle, pay benefits entirely from sales of appreciated assets and remain fully funded. In the extreme case where all returns are realized as capital gains, the pension sector pays benefits which both raises consumption and triggers a tax liability which lowers NIPA income.

How serious a drag on NIPA saving might this phenomenon be? Assume for the moment that all benefits paid are consumed. Then in each year the contribution to NIPA saving is:

$$\{\text{Saving}\} = \{\text{Contributions}\} + \{\text{Interest and dividend earnings}\} - \{\text{Benefits paid}\}.$$

Figure 4(a–c) shows contributions, earnings, and benefits paid for DB, DC, and IRA plans for the same years. It is clear that DB plans and, to a lesser extent, IRA plans have distributions well in excess of income components in recent years. In contrast, among DC plans, many of which are recently established 401(k) programmes, contributions outpace distributions in all years.

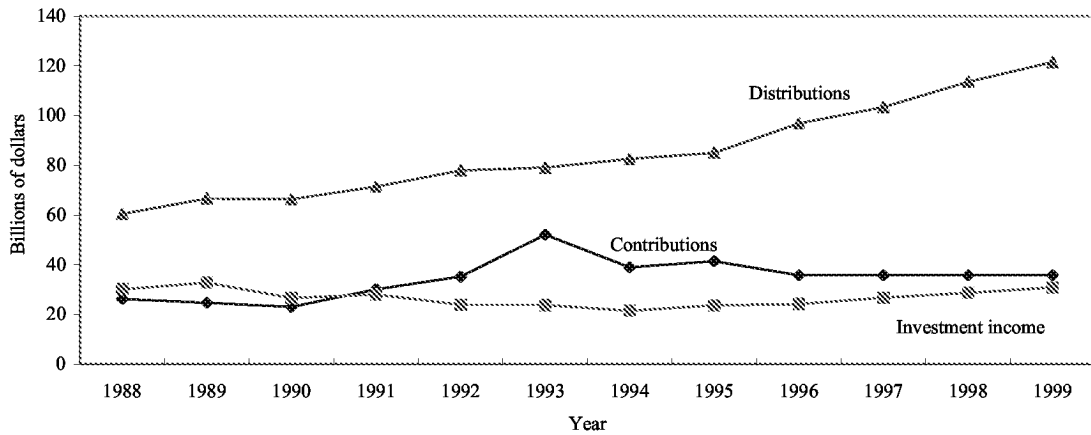
Table 1 shows the net contribution to NIPA saving for DB, DC, and IRA plans during the years 1988–1999.<sup>11</sup> The second column presents total NIPA saving in each year. The third column reports how much DB pension plans ‘add’ to NIPA total saving in each year. The figures are negative in all years and, in general, are increasingly large over time. Thus, for example, NIPA saving is lower by \$54.8 billion in 1999 because of transactions involving DB plans. This is the amount by which benefits paid exceeded income components (contributions and interest and dividend earnings). DC plans (column 4), however, generate positive saving flows. IRA plan flows are positive in the early years, but are negative after 1994. Like DB plan participants, IRA holders tend to be older, so by 1994 outflows exceed inflows.<sup>12</sup> Clearly, DB plans and, to a lesser extent,

<sup>10</sup> These capital gains are enormous relative to measured saving. In the boom year of 1995 there were \$229.4 billion of capital gains in DB plans, \$188.7 billion in DC plans, and \$208.9 billion in IRAs. By comparison, total NIPA saving in 1995 was \$302.4 billion.

<sup>11</sup> The sources of contribution data are described in footnote 9. DB and DC investment earnings and distribution data through 1996 are from the Form 5500. Investment earnings are estimated to be 10.6 per cent in 1997 and 7.39 per cent in 1998 and 1999. These are the rates of growth of imputed income for the entire pension sector in the NIPAs. DB and DC distributions are assumed to be 6.83 per cent for 1997, 9.71 per cent for 1998, and 7 per cent for 1999. These are the rates of growth for all private-sector retirement benefits in the NIPAs. The IRA data through 1998 are from Sabelhaus (2000). Data for 1999 are authors' estimates.

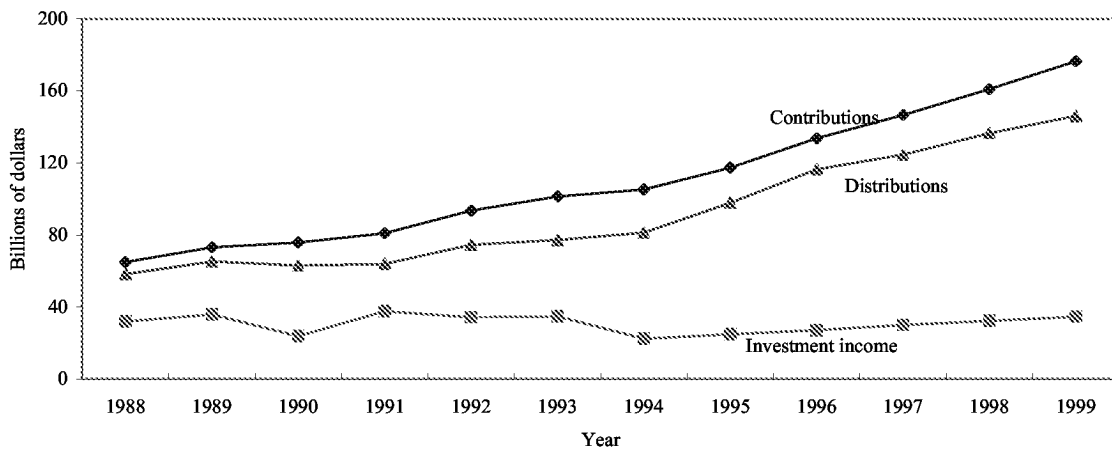
<sup>12</sup> The IRA flows also reflect the increasing importance of rollovers. Rollovers are most likely to occur among older persons with large pension accumulations who are separated from their jobs.

**Figure 4**  
**(a) DB Plan Inflows and Outflows**



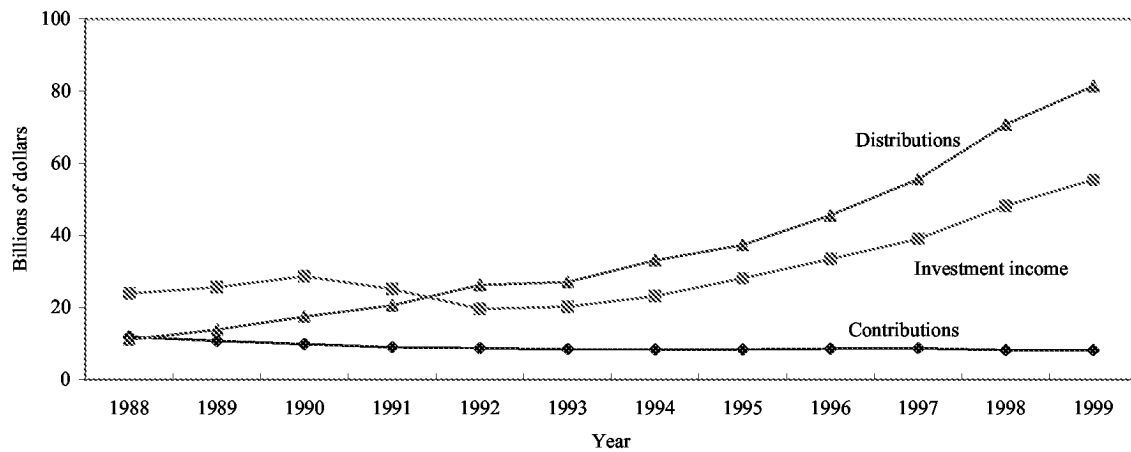
Source: Data for 1988–96 are from Form 5500. Data for 1997–9 are projected. See text for details.

**(b) DC Plan Inflows and Outflows**



Source: Data for 1988–96 are from Form 5500. Data for 1997–9 are projected. See text for details.

**(c) IRA Plan Inflows and Outflows**



Source: Data up to and including 1998 are from Sabelhaus (2000). Data for 1999 are authors' calculations.

**Table 1**  
**Treatment of Retirement Savings in the NIPA**

Year	Contribution to NIPA personal saving			NIPA personal saving rate	Without IRA, DC, and DB plans	Change in saving rate	
	NIPA personal saving	DB plans	DC plans				IRA plans
1988	292.3	-4.1	38.7	24.6	7.8	6.2	1.6
1989	30.8	-9.1	43.8	22.6	7.5	6.1	1.4
1990	334.3	-16.7	36.7	21.0	7.8	6.8	1.0
1991	371.7	-13.3	54.7	13.5	8.3	7.1	1.2
1992	413.7	-18.8	53.3	2.1	8.7	7.9	0.8
1993	350.8	-3.2	59.1	1.7	7.1	5.9	1.2
1994	315.5	-22.1	46.4	-1.6	6.1	5.7	0.4
1995	302.4	-20.0	44.5	-0.9	5.6	5.1	0.5
1996	272.1	-36.9	44.4	-3.4	4.8	4.7	0.1
1997	252.9	-40.9	52.3	-7.8	4.2	4.2	0.0
1998	265.4	-49.1	56.7	-14.4	4.2	4.3	-0.1
1999	147.6	-54.8	65.1	-17.8	2.2	2.3	-0.1

IRA plans now have distributions well in excess of contributions. In contrast, among DC plans, many of which are recently established 401(k) programmes, contributions outpace distributions in all years.

The final three columns illustrate what the NIPA saving rate would be without transactions involving DB, DC, and IRA plans. Of the 5.6 percentage point drop in the NIPA saving rate between 1988 and 1999 (from 7.8 per cent to 2.2 per cent), fully 1.7 percentage points are explained by the NIPA accounting of inflows and outflows for pension plans. Put another way, since 1995 retirement saving accounts have contributed *nothing* to NIPA saving.

One could argue that our assumption above that pension recipients consume all their benefits (rather than saving them) simply reflects the conventional 'wealth effects' story, albeit in a different guise. However, the taxable component of the pensions never reaches the recipient, but instead flows directly to the government; one recent estimate suggested that taxpayers withdrawing IRAs faced a tax rate of 27 per cent (Dusseault and Skinner,

2000). A more conservative measure of the accounting impact of pensions on personal saving considers: (i) the decline because of DB plans, which provide no capital gains to employees; (ii) the tax component of pension payments, which we assume to be 27 per cent; and (iii) just one-half of the after-tax DC and IRA withdrawals, assuming that the other half is accumulated capital gains (and thus part of the traditional wealth effect). Adding (i)–(iii) still yields 1.3 per cent of disposable national income, and we argue this is a lower bound to the true effect.

The second way in which accounting conventions affect personal saving is when individuals sell appreciated stock and pay capital gains taxes.<sup>13</sup> The gains realized do not affect income, but the taxes paid reduce disposable income. Even under the extreme assumption that individuals do not increase their consumption when they realize capital gains, NIPA saving would still decline. Estimates from Reinsdorf and Perozek (2000) suggest that capital gains taxes as a fraction of disposable income were 0.9 per cent in 1988, but had risen to 1.9 per cent in 1999, or an increase of 0.7 percentage points in government tax revenue.

<sup>13</sup> Here we follow the excellent analysis in Reinsdorf and Perozek (2000) with data updated to 1999 (personal communication); also see Poterba (2000).

To summarize: these two adjustments (retirement accounts plus capital gains taxes) yield a shift of between 2 and 2.4 per cent of DPI from personal saving to government plus corporate saving, and account for close to a third of the decline in saving.

## V. OTHER EXPLANATIONS FOR THE DECLINE IN SAVING

The overall estimated impact of capital gains on saving rates since 1988 amounts to between 5.8 and 7 percentage points (between 3.4 and 4.6 from wealth effects, 2.4 from measurement bias). While large, it cannot account for the entire 8.8 percentage point decline from 1988 to January 2001. Another explanation which has been proposed relies on fundamental shifts in the consumption patterns of the elderly relative to the non-elderly. Gokhale *et al.* (1996) argued that a variety of changes that occurred during the 1970s and 1980s led to the decline in national saving through 1990. They point to two factors, the transfer of resources from the young to the old through Social Security, Medicare, and pensions, and the increased annuitization of lifetime resources, as being particularly important in lowering national saving. However, since net national saving since 1990 has not really fallen—it was 6 per cent of GDP in 1988 and 5.9 per cent in the first three quarters of 2000—it is not clear how further annuitization or transfers during the 1990s should have affected measured personal saving.

An intriguing point raised in the Gokhale *et al.* (1996) study is the role of health-care expenditures in the saving decline. The entire growth in the ratio of consumption to GDP between 1988 and 2000 can be explained by increases in medical-care expenditures.<sup>14</sup> Whether this is just happenstance (i.e. people just happen to be devoting a larger share of their income to medical care during the 1990s) or because of more resources being transferred through Medicare and Medicaid on an in-kind basis, is not

entirely clear. Other explanations have also been suggested for the decline in saving, but, as discussed in Browning and Lusardi (1996) they do not seem likely to explain this short-term plunge.<sup>15</sup>

A frequently cited reason for the fall in personal saving during the 1990s is the easier access and wider availability of borrowing. Kennickell and Starr-McCluer (2000), using data from the 1998 SCF, show that the median amount of outstanding debt in 1998 stood 73.3 per cent above its level in 1989. Among the components of consumer credit, revolving debt (i.e. debt with flexible repayment schedules, which includes credit cards and overdraft plans on checking accounts) has grown much faster than non-revolving debt (see Maki, 2000).

However, the increase in debt as a fraction of income was not the cause for the decline in personal saving. From the Federal Reserve Flow of Funds accounts, the biggest factor accounting for the drop in the FFA measure of household saving (which excludes capital gains) was the fall in the purchase of financial assets, from 15.5 per cent of disposable personal income (DPI) in 1988 down to 4.1 per cent in the first three quarters of 2000.<sup>16</sup> The net increase in liabilities increased only slightly, from 9.3 per cent of DPI in 1988 to 9.9 per cent in 2000.

While the level of debt may not have been important for aggregate personal saving, it is worth checking to see whether it can explain low saving for specific households, a topic we consider in more detail below. Maki (2000) shows that the debt service burden, defined as households' required debt service payments relative to DPI, is at a relatively high level (approximately 14 per cent of disposable personal income). However, similar and even higher levels were reached in the mid-1980s. None the less, one disturbing trend is the increase in the fraction of families for whom debt payments amount to more than 40 per cent of income (see Kennickell and Starr-McCluer, 2000).

<sup>14</sup> The consumption to GDP ratio grew by 2 percentage points, while the consumption net of medical care ratio did not grow at all. See also Parker (1999).

<sup>15</sup> See also Attanasio (1998). For an earlier discussion of the decline in saving, see the excellent work by Bosworth *et al.* (1991).

<sup>16</sup> Nearly all of that decline was accounted for by the decline in the net acquisition of securities (from 2.3 per cent of DPI in 1988 to -7.3 per cent in 2000). This pattern is consistent with the Maki and Palumbo (2001) result that much of the sell-off consisted of the (non-retirement account) assets typically held by the wealthy. See also Gale and Sabelhaus (1999).

## VI. PERSONAL SAVING AND CAPITAL ACCUMULATION

Up to this point, we have tried to answer the question of why NIPA personal saving fell by so much. Many observers have argued that focusing on NIPA measures of saving is too narrow anyway, since it ignores capital gains, an important component of household wealth accumulation. Should capital gains, however, be included in measures of aggregate national saving?

The answer in the literature appears to be ‘it depends’ (Auerbach, 1985; Gale and Sabelhaus, 1999; Hall, 2000). If the capital gain occurred because of an improvement in productivity—i.e. a new approach to organizing retail sales through the Internet—then one could argue the capital gain is measuring a true increment in the capital stock. In Hall’s (1999, 2000) terminology, this would be described as e-capital, and should therefore be included in aggregate saving (and investment). However, as Cummins (2000) argues, ‘if equity prices faithfully reflect the value of a firm’s e-capital, Yahoo! has destroyed an enormous amount of e-capital in the last six months’ (p. 108).

A conventional view is that stock-market prices today depend on, among other things, the expectation of future profits. The capital gains realized today allow the stockholder to ‘borrow’ against those future profits, and consume them now. Similar issues hold if discount rates are reduced, thereby leading to capital appreciation without real changes in productivity or income (Auerbach, 1985; Gale and Sabelhaus, 1999).<sup>17</sup> While we recognize the theoretical potential for productivity gains to be reflected in stock-market appreciation, we focus here on conventional NIPA measures of aggregate (national) saving as an adequate measure of funds for investment.

Figure 5 shows personal saving, net domestic saving, and investment in the United States from 1980

through the first three quarters of 2000, expressed as a fraction of GDP. The decline in personal saving is shown clearly here. What is remarkable is that investment in 2000 is at a 15-year high. Recall that net investment is equal to the sum of (i) personal saving from households and unincorporated businesses, (ii) corporate net retained profits, (iii) government net saving, and (iv) capital inflows from foreign sources. So it is an accounting identity that if personal saving drops by 7 per cent of GDP, either the other sources rise, or investment falls, or both.

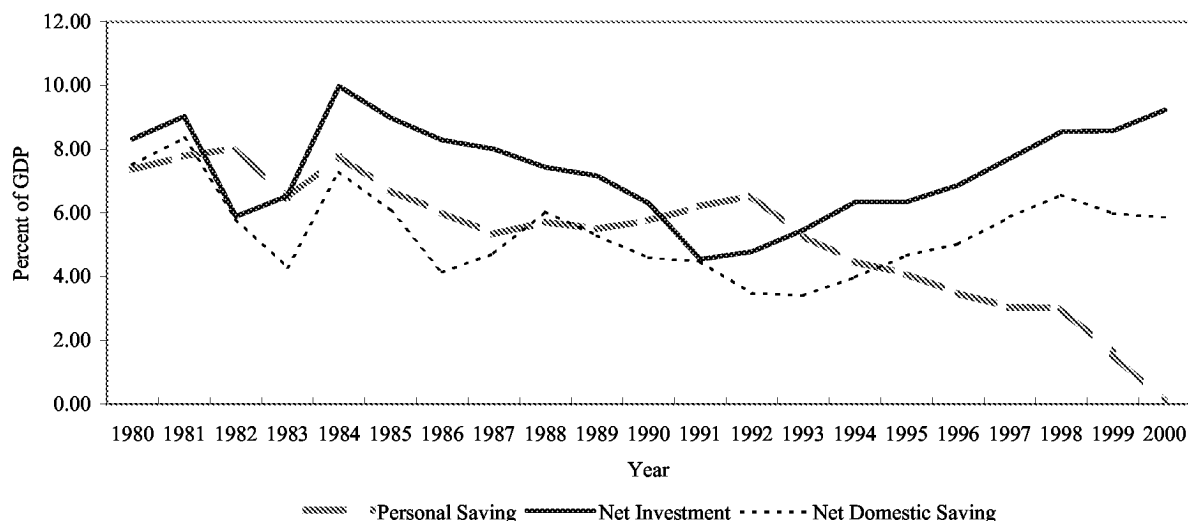
What is remarkable is how much the other sources of funds rose during the 1990s, so that by 2000, government saving (3 per cent), business saving (2.8 per cent), and foreign capital flows (3.4 per cent) fully supported net investment.<sup>18</sup> As we have argued above, part of this offsetting effect is because of the measurement issues regarding pensions and capital gains taxes. But there is clearly more than measurement offsets going on here. A Ricardian approach might posit that individual consumers have already integrated the budget surplus in their consumption plans (e.g. Barro, 1989). The decline in personal saving does raise the question about what happens should government saving falter and foreign investors lose their taste for US assets. Should the government adjust tax policy to encourage personal (and national) saving?

Targeting aggregate personal saving would appear to be both expensive and not necessarily beneficial. Even aside from the problems of measuring saving from the household sector (noted above), it is not entirely clear that we know how other sources of saving respond, or what is the ‘right’ rate of personal saving at a particular point in time. Market-based economies rely on interest rates, exchange rates, and internal corporate funds to regulate investment, and it is not clear that the government has the resources or the acumen to improve their functioning. Furthermore, the revenue costs of trying to change saving rates by 2 or 3 percentage points is

<sup>17</sup> Gale and Sabelhaus (1999) suggest a different scenario in an open economy, but, in that case, the interest rate would remain unchanged and thus we would not observe any change in the rate at which future income is discounted. Also, wealth could rise because of changes in land value, but, once again, in a life-cycle model this does not represent an increase in the real productivity of the economy, but is instead a transfer of wealth from younger to older generations (e.g. Auerbach, 1985; Skinner, 1996).

<sup>18</sup> All measures for 2000 are through the third quarter. The statistical discrepancy is included with foreign capital inflows.

**Figure 5**  
**Investment and Saving**



potentially large, and could have an adverse impact on government saving.

None the less, it seems clear that tax policy towards the very wealthy could have an impact on overall saving, and will certainly affect the composition of assets owned.<sup>19</sup> Explaining the motivations for wealth accumulation in this group—for example, why very high income households accumulate more than 40 per cent of income and seem unlikely to spend it at retirement (Dyran *et al.*, 2000)—is a challenge for economists. Bequests are one possibility, but as Carroll (2000) has argued, it is unlikely that the ‘excess’ saving and wealth accumulation is for bequests alone, since few if any very wealthy people mention gifts to children as their primary reason for accumulation. More recently, Gentry and Hubbard (2000), Quadrini (1999), and Hurst and Lusardi (2000) have pointed to the importance of entrepreneurial business wealth as a motivation for (largely undiversified) saving that is unlikely to be spent down at retirement. While there is a growing body of research on the behaviour of the very wealthy (see Slemrod, 2000; Carroll *et al.*, 2000), the overall influence of tax policy on saving rates of the very wealthy is not well understood.

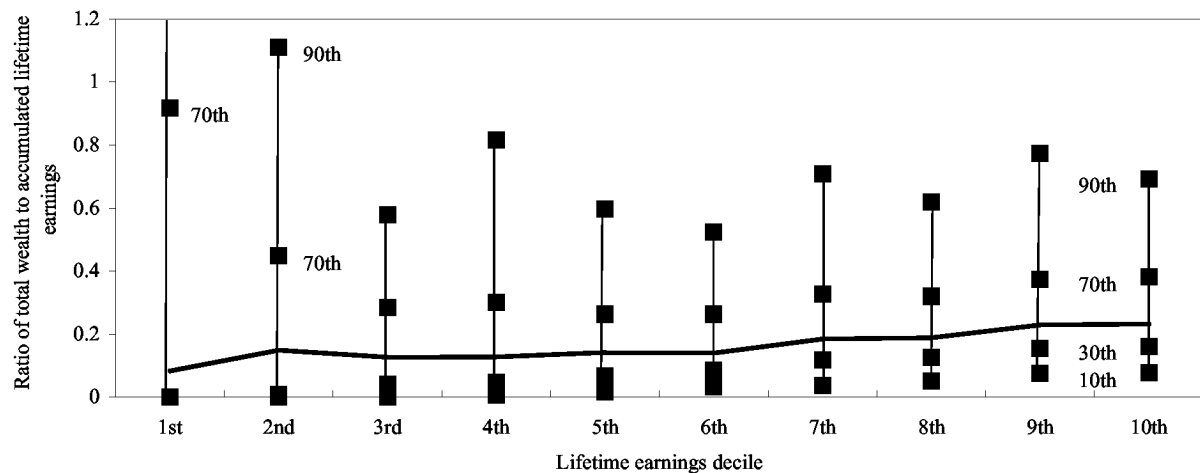
## VII. PERSONAL SAVING, STOCK-MARKET WEALTH, AND HOUSEHOLD FINANCIAL SECURITY

At least in the news media, the declining personal saving rate has been interpreted as a disturbing trend for the financial security of American households. In this view, the declining personal saving rates make households ‘vulnerable to financial disaster’ (Bryant, 2001). On the other hand, stock-market capital gains have been increasing the wealth and security of at least some households (see Figure 2). How have these trends affected the financial security of US households?

Aggregates tell us little about wealth accumulation among specific individual households. Here we consider the record by looking at the distribution of wealth (i.e. accumulated saving plus capital gains) at the micro level. We first try to establish how widespread low savings or low wealth is in the population. Which groups fail to save? We then consider changes in either saving or wealth over time.

<sup>19</sup> Gentry and Hubbard (2000), for example, using data from the 1989 SCF, show that entrepreneurs account for 8.7 per cent of the population, but for as much as 39 per cent of total net worth and 38 per cent of total assets.

**Figure 6**  
**The 10th, 30th, 50th, 70th, and 90th Percentiles of the Ratio of Total Wealth to Lifetime Earnings, by Lifetime Earnings Decile**



*Source:* Authors' calculations from the 1992 HRS. The 90th percentile for the 1st earnings decile (not shown) is 4.09.

There is little question that saving rates vary with income and that low income explains the low level of saving of some households. However, the amount of variation in saving, even after accounting for income, is often underestimated. Figure 6 presents the 10th, 30th, 50th, 70th, and 90th percentiles of total wealth as a fraction of lifetime earnings for each of 10 lifetime earnings deciles.<sup>20</sup> It is clear that a large segment of the population saves nothing. Many of these households have low lifetime earnings, but significant numbers of higher lifetime earnings households have saved small amounts as well. It is also clear that some low earnings households manage to save relatively substantial amounts. And of course, some households, particularly those with high earnings, accumulate a great deal.

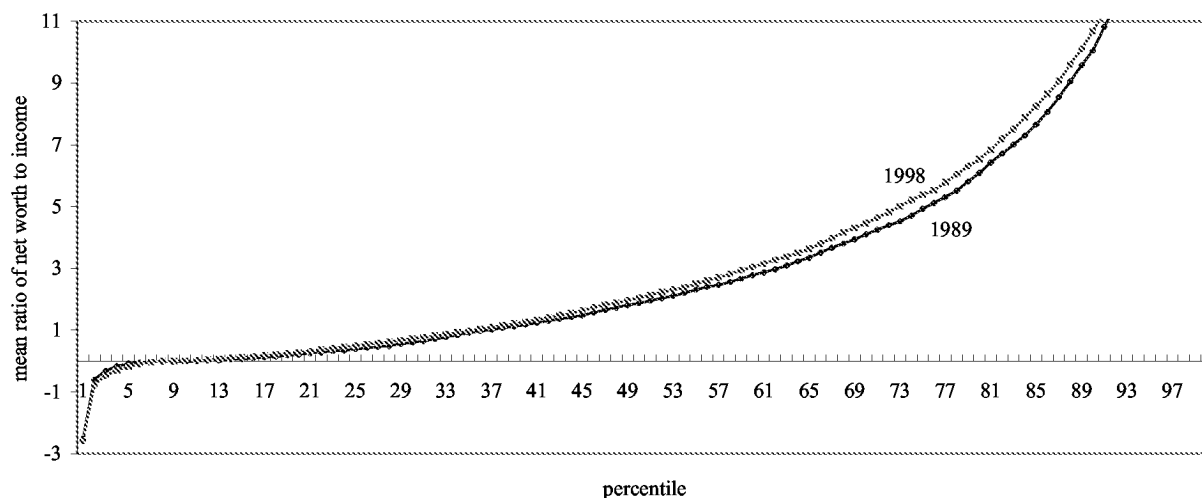
We have already mentioned that there is a group of households that hold large amounts of wealth. This is the result of high rates of saving and the large capital gains enjoyed from stock-market wealth. Whether via direct holdings, mutual funds, or retirement accounts, households that participated in the stock market have witnessed their wealth increase at a rapid pace. As shown in Figure 2, saving rates inclusive of capital gains have increased not de-

creased during the late 1990s. In addition, the expansion of retirement programmes has helped many households improve their retirement financial security. Thus, irrespective of a declining NIPA saving rate, for many households the prospects for retirement are much better today than they were a decade ago. As mentioned before, in a world with capital gains, low levels of or even declining NIPA saving do not necessarily mean less wealth over time.

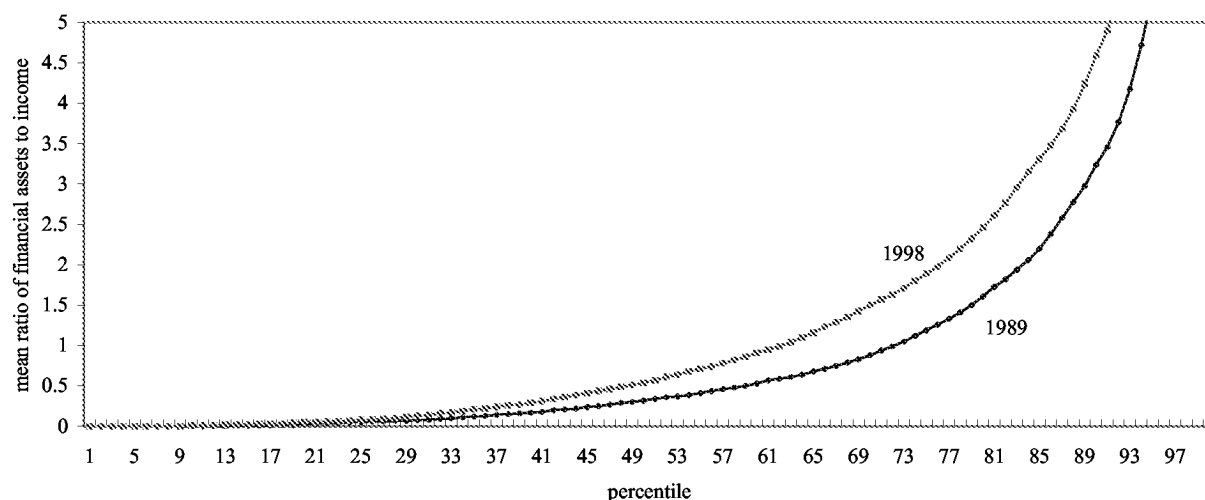
To analyse how capital gains have affected wealth in recent years, we compare the ratio of wealth to income in 1998 to the ratio in 1989 using data from the SCF; these are shown in Figures 7(a) and 7(b). The first figure shows the ratio of net worth (financial assets, business assets, and property less debts) to income. There is very little change in this measure of wealth for the lower quarter of the distribution. There is a modest, but uniform, upward shift in wealth for the top half of the distribution; at the 50th percentile the mean ratio was 2.05 in 1998 and 1.88 in 1989. Net worth is, of course, dominated by housing and business assets that did not show the same sharp increase as is observed for stock prices. The results for financial assets in Figure 7(b) are

<sup>20</sup> Total wealth includes housing, retirement assets, business wealth, and financial. Lifetime earnings are calculated from Social Security earnings histories. See Venti and Wise (1998, 2000) for details. See also Smith (1995).

**Figure 7**  
**(a) Ratio of Net Worth to Income, 1989 and 1998**



**(b) Ratio of Financial Assets to Income, 1989 and 1998**



more striking. Again there is virtually no change for the lower quartile of the distribution. However, there is a substantial increase in financial wealth between 1989 and 1998 for the upper half of the distribution. At the 50th percentile the ratio of financial assets to income increased from 0.32 to 0.54 and at the 75th percentile the ratio increased from 1.19 to 1.89. This suggests that a large fraction

of the population is noticeably better off in 1998 than in 1989—mostly as the result of capital gains.<sup>21</sup> None the less, a stubborn quarter or so of the population (not necessarily the same persons over time) appear to have been unaffected by the recent boom. They saved little in 1989 and they save little in 1998 and account for little of aggregate personal saving in either year.

<sup>21</sup> Gale (1998) has argued that after-tax wealth should be considered in making comparisons over time. We also considered changes in the wealth distribution using after-tax DC wealth in both years (with an assumed tax rate of 27 per cent), and found a smaller change but a very similar pattern. For example, the 1998/1989 difference in the 50th percentile was an increase of 0.22 in wealth without adjustment, and 0.18 with adjustment. One shortcoming of these data is that we do not know individual defined benefit (DB) wealth. However, since FFA data show that the ratio of DB assets to disposable income increased from 23 per cent in 1989 to 31 per cent in 1998, we would expect an even wider difference in the wealth distribution including DB plan wealth.

How can we be sure that these households really do have inadequate wealth accumulation? Some have argued that what we deem ‘low wealth’ households need not save much given that they are still young, or that they can expect generous relative retirement benefits, either from Social Security or from other pension plans (Gustman and Steinmeier, 1999; Huggett and Ventura, 2000). As it turns out, Social Security and pension wealth differences across income groups do not explain that low-income households are more likely to be low savers as well. Dynan *et al.* (2000) imputed Social Security and pension saving in a sample of households during the 1980s. They found that even within age groups (i.e. those ages just prior to retirement where life-cycle models predict vigorous saving) lower-income households accumulate at minimal levels compared to higher-income households, even after accounting for the progressivity of Social Security.

What is an ‘adequate’ saving rate? A number of studies have attempted to determine what is an adequate level of saving and wealth accumulation given the presence of Social Security and pension funds.<sup>22</sup> One approach is to compare actual wealth with the amount of wealth deemed necessary to smooth consumption at retirement (Gustman and Steinmeier, 1999; Moore and Mitchell, 2000; Warshawsky and Ameriks, 2000). Generally, these studies find about half of the population will not be able to preserve consumption levels after retirement. Of course, the key assumption in the replacement rate analyses in both types of studies is that households wish to maintain consumption levels into retirement, a matter about which little is known.<sup>23</sup>

More recently, Engen *et al.* (1999) have demonstrated that in simulation models with random earnings shocks, there will be wealth heterogeneity because some families will experience positive shocks, others negative shocks. They can explain some, but not all of the observed heterogeneity among households nearing retirement. Hubbard *et al.* (1995) also used a simulation approach to find that asset-based means testing of welfare pro-

grammes could lead to households (optimally) holding very low levels of wealth.

A third approach is to test empirically the extent to which households suffer a decline in consumption at retirement. Most studies show a sharp drop, more than can be rationalized by explanations consistent with traditional models of saving, and/or extensions that take account of non-separabilities between expenditures, leisure, and work.<sup>24</sup> Bernheim *et al.* (2000), for example, find that even after instrumenting for endogenous retirement decisions, roughly one-third of retirees experienced a drop in consumption of more than 35 percentage points.

To sum up, we believe that there is a significant group of households with saving rates too low to be explained by conventional life-cycle models. A growing literature has focused on behavioural explanations for why some households fail to save. Some households have difficulty recognizing the need to save and calculating the saving they need to do. For example, Lusardi (1999, 2000) used data from the Health and Retirement Survey (HRS)—in which respondents are only a few years away from retirement—and found that as many as 30 per cent of respondents have not given any thought whatsoever to retirement plans.<sup>25</sup> Most importantly, she found that the lack of planning leads to low levels of wealth accumulation, participation in retirement plans, and ownership of stocks. Some households may simply face high planning costs or lack financial literacy; they find planning for retirement too complicated and they do not know how to find help to do it (Bernheim, 1995; Yakoboski and Dickemper, 1997). There is also evidence that households are not well informed about their Social Security and pensions benefits. Gustman and Steinmeier (2000) report that workers often do not know the types of pension they have (whether DB or DC) or the benefits associated with it.

A related problem is that even households that make financial plans may not be able to carry them out. As a series of papers have suggested, people may

<sup>22</sup> For an earlier debate on this question, see Congressional Budget Office (1993) and Bernheim (1993, 1995).

<sup>23</sup> One reason why many replacement rate studies, including those referenced in the above footnote, arrive at different conclusions is that the studies make a variety of assumptions about the use of housing wealth to finance consumption in retirement.

<sup>24</sup> See, among others, Hamermesh (1984), Mariger (1987), Hausman and Paquette (1987), and, especially, Banks *et al.* (1998).

<sup>25</sup> In the conventional life-cycle model, rational individuals make optimal consumption and saving plans starting at time 0. See also Yakoboski and Dickemper (1997).

display hyperbolic rather than exponential discount functions (see, Laibson, 1997; Laibson *et al.*, 1998; O'Donoghue and Rabin, 1999*a,b*). For hyperbolic agents, short-run discount rates are higher than long-term rates, so decision-making is time inconsistent. When combined with costs of planning, this gives rise to much inaction: people procrastinate on making decisions that require immediate effort (Akerlof, 1991). In these types of models, people suffer from self-control problems and thus fail to follow through on plans to save (Thaler and Shefrin, 1981).

If individual savers have trouble doing so because they lack information, or because of these dynamic inconsistencies suggested above, then the justification for government policies to encourage saving becomes stronger. For example, one problem is that low-income workers are simply less likely to be covered by employer-sponsored pension plans which overcome many of the behavioural impediments to saving. In 1993 about 8 per cent of workers with incomes less than \$10,000 and 35 per cent of workers with incomes less than \$20,000 worked for an employer offering a pension. In contrast, over 80 per cent of full-time workers earning more than \$50,000 are covered (US Department of Labor, 1994).

Given coverage, participation in most DB and conventional DC plans is typically mandatory. However, if the worker is covered by a 401(k) plan, then participation is often voluntary. There is a substantial literature that suggests participation is sensitive to plan design and the level of information and support provided by employers (see Bernheim and Garrett, 1996; Clark and Schieber, 1998; Duflo and Saez, 2000; Madrian and Shea, 2000). Of course a key issue is whether retirement saving programmes increase saving. While this has been a matter of much debate (see Engen *et al.*, 1996; Hubbard and Skinner, 1996; Poterba *et al.*, 1996), there is a consensus that pensions and 401(k)s, are effective at stimulating saving, particularly among low-income households.<sup>26</sup> Furthermore, these pension plans entail relatively little revenue cost (Hubbard and Skinner, 1996), and with strong capital gains, could even raise revenue for the government (Dusseault and Skinner, 2000).

Another explanation for low rates of saving is the presence of asset-based means-tested welfare programmes (e.g. Hubbard *et al.*, 1995; Gruber and Yelowitz, 1999). Among those with a relatively high chance of qualifying for (and desiring support from) welfare programmes, the asset limitations impose quite stringent restrictions on saving and accumulating wealth. Welfare recipients can be legally prosecuted for saving above the legal limits. Gruber and Yelowitz (1999) found that such asset-based means-tested programmes reduced wealth (and presumably saving) by 17 per cent among lower income groups. Since there is so little saving anyway among this group, removing all asset-based means testing can increase wealth accumulation at relatively little cost to the government.

Other options include an expansion of Social Security saving, either through subsidized saving accounts or personal equity accounts in addition to traditional pension benefits. Finally, it would appear that there is a role for improving financial education and the 'framing' of retirement plans in a way that encourages participation. Madrian and Shea (2000), for example, found that making 401(k) participation a default (rather than a choice) had a strong influence on whether employees joined the pension plan.

## VIII. CONCLUSIONS

This paper began with the puzzle of why the measured personal saving rate has fallen to zero. We find that capital gains in the stock market have explained much of the decline in the NIPA saving rate, through both behavioural and accounting channels. Traditional wealth effects on consumption can explain two-fifths to one-half of the overall fall since 1988, although we recognize the wide range of estimated wealth effects in the literature. Accounting issues linked to the effects of capital gains on retirement accounts and tax revenues suggest another third of the decline is shifted from the household sector to the government or corporate sectors.

The decline in NIPA personal saving has not dragged down the rate of investment. Corporate and government saving rates have more than offset the lost

<sup>26</sup> Results from Gustman and Steinmeier (1999) suggests pension saving leads to higher overall saving; on the other hand see Gale (1998). Engen and Gale (2000) suggest that 401(k) balances are largely new saving among lower-income households.

flows of resources from the household sector. With regard to policy interventions, we suggested that the ability of the federal government is limited with respect to its ability to target the aggregate personal saving rate, as is the justification for why the government should intervene with regard to aggregate personal saving. Nevertheless, we recognize the importance of better understanding the saving behaviour of the very rich, who account for a large fraction of aggregate personal saving.

The NIPA saving rate is much less useful as a gauge of financial preparation for retirement or other

contingencies. Principally because of capital gains, most of the population appears to be better prepared today than a decade ago. While the run-up in the value of financial assets including retirement assets has benefited many households, not everybody has shared these gains. We identified a second puzzle, the persistence of a large sub-group of Americans saving so little. We have argued that for this puzzle, there are policies that appear to be relatively effective. It may be the case that government policy is more effective (and cost-effective) at encouraging retirement security than increasing the aggregate personal saving rate.

## REFERENCES

- Ainslie, G. (1992), *Picoeconomics*, New York, Cambridge University Press.
- Akerlof, G. (1991), 'Procrastination and Obedience', *American Economic Review Papers and Proceedings*, **81**, 1–19.
- Attanasio, O. (1998), 'Cohort Analysis of Saving Behavior by US Households', *Journal of Human Resources*, **33**, 575–609.
- Auerbach, A. (1985), 'Saving in the US: Some Conceptual Issues', in P. Hendershott (ed.), *The Level and Composition of Household Saving*, Cambridge, MA, Ballinger.
- Banks, J., Blundell, R., and Tanner, S. (1998), 'Is There a Retirement-saving Puzzle?', *American Economic Review*, **88**, 769–88.
- Barberis, N., Huang, M., and Santos, T. (2001), 'Prospect Theory and Asset Prices', *Quarterly Journal of Economics*, forthcoming.
- Barro, R. (1989), 'The Ricardian Approach to Budget Deficits', *Journal of Economic Perspectives*, **3**(2), 37–54.
- Bernheim, B. D. (1993), 'Is the Baby Boom Generation Preparing Adequately for Retirement?', Summary Report, Princeton, NJ, Merrill Lynch.
- (1995), 'Do Households Appreciate Their Financial Vulnerabilities? An Analysis of Actions, Perceptions, and Public Policy', *Tax Policy and Economic Growth*, Washington, DC, American Council For Capital Formation, 1–30.
- Garrett, D. (1996), 'The Determinants and Consequences of Financial Education in the Workplace', NBER Working Paper No. 5667.
- Shoven, J. (1988), 'Pension Funding and Saving', in Z. Bodie, J. Shoven, and D. Wise (eds), *Pensions in the US Economy*, Chicago, IL, University of Chicago Press.
- Skinner, J., and Weinberg, S. (2000), 'What Accounts for the Variation in Retirement Wealth Among US Households?', *American Economic Review*, forthcoming.
- Bosworth, B., Burtless, G., and Sabelhaus, J. (1991), 'The Decline in Saving: Evidence from Household Surveys', *Brookings Papers on Economic Activity*, **1**, 183–241.
- Bradford, D. (1990), 'What is National Saving?: Alternative Measures in Historical and International Context', in C. Walker, M. Bloomfield, and M. Thorning (eds), *The US Savings Challenge*, Boulder, CO, Westview Press, 31–75.
- Brayton, F., and Tinsley, P. (1996), 'A Guide to the FRB/US: A Macroeconomic Model of the United States', Board of Governors Working Paper No. 1996-42.
- Browning, M., and Lusardi, A. (1996), 'Household Saving: Micro Theories and Micro Facts', *Journal of Economic Literature*, **34**, 1797–855.
- Bryant, A. (2001), 'Drowning in a Sea of Debt', *Newsweek*, 5 February, 43.
- Carroll, C. (2000), 'Why Do the Rich Save So Much?', in J. Slemrod (ed.), *Does Atlas Shrug?*, New York, Russell Sage Foundation and Harvard University Press, 465–84.
- Carroll, R., Holtz-Eakin, D., Rider, M., and Rosen, H. S. (2000), 'Entrepreneurs, Income Taxes, and Investment', in J. Slemrod (ed.), *Does Atlas Shrug?*, New York, Russell Sage Foundation and Harvard University Press.
- Clark, R., and Schieber, S. (1998), 'Factors Affecting Participation Levels in 401(k) Plans', in O. Mitchell and S. Schieber (eds), *Living With Defined Contribution Plans*, Philadelphia, PA, Pension Research Council.

- Congressional Budget Office (1993), *Baby Boomers in Retirement: An Early Perspective*, Washington DC, GPO.
- Cummins, J. G. (2000), 'Comment on Robert E. Hall, "E-Capital: The Link Between the Stock Market and the Labor Market in the 1990s"', *Brookings Papers on Economic Activity*, 2, 103–10.
- Duflo, E., and Saez, E. (2000), 'Participation and Investment Decisions in a Retirement Plan: The Influence of Colleagues Choices', NBER Working Paper No. 7735.
- Dusseault, B., and Skinner, J. (2000), 'Did Individual Retirement Accounts Raise Revenue?', *Tax Notes*, 5 February.
- Dynan, K., and Maki, D. (2000), 'Does Stock Market Wealth Matter for Consumption?', Federal Reserve Board of Governors, mimeo.
- Skinner, J., and Zeldes, S. (2000), 'Do the Rich Save More?', Dartmouth College, mimeo.
- Engen, E., and Gale, W. (2000), 'The Effects of 401(k)s Plans on Household Wealth: Differences Across Earnings Groups', Federal Reserve Board of Governors, mimeo.
- — Scholz, K. (1996), 'The Illusory Effects of Saving Incentives on Saving', *Journal of Economic Perspectives*, 10, 113–38.
- — Uccello, C. (1999), 'The Adequacy of Retirement Saving', *Brookings Papers on Economic Activity*, 2, 65–165.
- Gale, W. (1998), 'The Effects of Pensions on Household Wealth: A Reevaluation of Theory and Evidence', *Journal of Political Economy*, 106(4), 706–23.
- Sabelhaus, J. (2000), 'Perspectives on the Household Saving Rate', *Brookings Papers on Economic Activity*, 1, 181–214.
- Gentry, W., and Hubbard, G. (2000), 'Entrepreneurship and Household Saving', Columbia Business School, mimeo.
- Gokhale, J., Kotlikoff, L., and Sabelhaus, J. (1996), 'Understanding the Postwar Decline in US Saving: A Cohort Analysis', *Brookings Papers on Economic Activity*, 1, 315–90.
- Gruber, J., and Yelowitz, A. (1999), 'Public Health Insurance and Private Savings', *Journal of Political Economy*, 107, 1249–74.
- Gustman, A., and Steinmeier, T. (1992), 'The Stampede Towards Defined Contribution Plans: Fact or Fiction', *Industrial Relations*, 31, 361–9.
- — (1999), 'Effects of Pensions on Savings: Analysis with Data From the Health and Retirement Study', *Carnegie-Rochester Conference Series on Public Policy*, 50, 271–324.
- — (2000), 'What People Don't Know about their Pensions and Social Security', in W. Gale, J. Shoven, and M. Warshawsky (eds), *Public Policies and Private Pensions*, Washington, DC, Brookings Institution Press.
- Hall, R. E. (1999), 'The Stock Market and Capital Accumulation', NBER Working Paper No. 7180, June.
- (2000), 'E-Capital: The Link between the Stock Market and the Labor Market in the 1990s', *Brookings Papers on Economic Activity*, 2, 73–102.
- Hamermesh, D. (1984), 'Consumption During Retirement: The Missing Link in the Life Cycle', *Review of Economics and Statistics*, 66, 1–7.
- Hassett, K. (2000), 'Hey, Mr Greenspan: Wealth Creation Isn't A Problem', *The Wall Street Journal*, 26 June, A46.
- Hausman, J., and Paquette, L. (1987), 'Involuntary Early Retirement and Consumption', in G. Burtless (ed.), *Work, Health and Income Among the Elderly*, Washington DC, Brookings Institution, 151–81.
- Holloway, T. (1989), 'Present NIPA Saving Measures: Their Characteristics and Limitations', in R. Lipsey and H. Tice (eds), *The Measurement of Saving, Investment, and Wealth*, Chicago, IL, University of Chicago Press.
- Hubbard, R. G., and Skinner, J. (1996), 'Assessing the Effectiveness of Saving Incentives', *Journal of Economic Perspectives*, 10, 73–90.
- Zeldes, S. (1995), 'Precautionary Saving and Social Insurance', *Journal of Political Economy*, 103, 360–99.
- Huggett, M., and Ventura, G. (2000), 'Understanding Why High Income Households Save More than Low Income Households', *Journal of Monetary Economics*, 45, 361–97.
- Hurst, E., and Lusardi, A. (2000), 'Entrepreneurship and Wealth Accumulation', Dartmouth College, mimeo.
- Ippolito, R. (1998), 'Reversion Taxes, Contingent Benefits, and the Decline in Pension Funding', mimeo.
- Juster, F. T., Lupton, J., Smith, J., and Stafford, F. (1999), 'Savings and Wealth: Then and Now', University of Michigan, mimeo.
- Kennickell, A., and Starr-McCluer, M. (2000), 'Recent Changes in US Family Finances: Results from the 1998 Survey of Consumer Finances', Federal Reserve Bulletin, January, 1–29.
- Khitatrakun, S., Kitamura, Y., and Scholz, J. K. (2000), 'Pensions and Wealth: New Evidence From the Health and Retirement Study', University of Wisconsin, Madison, mimeo.
- Laibson, D. (1997), 'Golden Eggs and Hyperbolic Discounting', *Quarterly Journal of Economics*, 112, 443–78.
- Repetto, A., and Tobacman, J. (1998), 'Self-control and Saving for Retirement', *Brookings Papers on Economic Activity*, 1, 91–172.

- Lettau, M., and Ludvigson, S. (2000), 'Understanding Trend and Cycle in Asset Values', Federal Reserve Bank of New York, mimeo.
- Ludvigson, S., and Steindel, C. (1999), 'How Important is the Stock Market Effect on Consumption?', *Federal Reserve Bank of New York Economic Policy Review*, 5(July), 29–52.
- Lusardi, A. (1999), 'Information, Expectations, and Savings for Retirement', in H. Aaron (ed.), *Behavioral Dimensions of Retirement Economics*, Washington, DC, Brookings Institution and Russell Sage Foundation, 81–115.
- (2000), 'Explaining Why So Many Households Do Not Save', Dartmouth College, Working Paper.
- Madrian, B., and Shea, D. (2000), 'The Power of Suggestion: Inertia in 401(k) Participation and Saving Behavior', NBER Working Paper No. 7682.
- Maki, D. (2000), 'The Growth of Consumer Credit and the Household Debt Service Burden', Federal Reserve Board of Governors, mimeo.
- Palumbo, M. (2001), 'Disentangling the Wealth Effect: A Cohort Analysis of Household Saving in the 1990s', Federal Reserve Board of Governors, mimeo.
- Mariger, R. (1987), 'A Life-cycle Consumption Model with Liquidity Constraints: Theory and Empirical Results', *Econometrica*, 55, 533–57.
- Moore, J. F., and Mitchell, O. S. (2000), 'Projected Retirement Wealth and Savings Adequacy in the Health and Retirement Study', in O. Mitchell, B. Hammond, and A. Rappaport (eds), *Forecasting Retirement Needs and Retirement Wealth*, Pension Research Council, Philadelphia, PA, University of Pennsylvania Press, 68–94.
- O'Donoghue, T., and Rabin, M. (1999a), 'Doing It Now or Later', *American Economic Review*, 89, 103–24.
- — (1999b), 'Procrastination in Preparing for Retirement', in H. Aaron (ed.), *Behavioral Dimensions of Retirement Economics*, Washington, DC, Brookings Institution and Russell Sage Foundation, 125–56.
- Otoo, M. (1999), 'Consumer Sentiment and the Stock Market', Federal Reserve Board of Governors Finance and Discussion Series Working Paper No. 1999-60.
- Parker, J. (1999), 'Spendthrift in America? On Two Decades of Decline in the US Saving Rate', in B. Bernanke and J. Rotemberg (eds), *NBER Macroeconomics Annual 1999*, 317–70.
- Peach, R., and Steindel, C. (2000), 'A Nation of Spendthrifts? An Analysis of Trends in Personal and Gross Saving', *Current Issues in Economics and Finance*, 6, 1–6.
- Poterba, J. (2000), 'Stock Market Wealth and Consumption', *Journal of Economic Perspectives*, 14, 99–118.
- Samwick, A. (1995), 'Stock Ownership Patterns, Stock Market Fluctuation and Consumption', *Brookings Papers on Economic Activity*, 2, 295–357.
- Venti, S., and Wise, D. (1996), 'How Retirement Saving Programs Increase Saving', *Journal of Economic Perspectives*, 10, 91–112.
- Quadrini, V. (1999), 'The Importance of Entrepreneurship for Wealth Concentration and Mobility', *Review of Income and Wealth*, 45, 1–20.
- Reinsdorf, M., and Proezek, M. (2000), 'Alternative Measures of Personal Saving and Measures of Change in Personal Wealth', Federal Reserve Board of Governors, Washington DC, November, mimeo.
- Sabelhaus, J. (2000), 'Modeling IRA Accumulation and Withdrawals', *National Tax Journal*, 53(4, part 1), December, 865–76.
- Seskin, E., and Parker, R. (1998), 'A Guide to the NIPAs', *Survey of Current Business*, 78, 26–68.
- Skinner, J. (1996), 'The Dynamic Efficiency Cost of Not Taxing Housing', *Journal of Public Economics*.
- Slemrod, J. (ed.) (2000), *Does Atlas Shrug? The Economic Consequences of Taxing the Rich*, New York, Russell Sage Foundation and Harvard University Press.
- Smith, J. (1995), 'Racial and Ethnic Differences in Wealth in the Health and Retirement Study', *Journal of Human Resources*, 30, S159–83.
- Starr-McCluer, M. (2000), 'Stock Market Wealth and Consumption', Federal Reserve Board of Governors, mimeo.
- Summers, L., and Carroll, C. (1987), 'Why Is US National Saving So Low?', *Brookings Papers on Economic Activity*, 2, 607–35.
- Thaler, R., and Shefrin, H. (1981), 'An Economic Theory of Self-control', *Journal of Political Economy*, 89, 392–406.
- US Department of Labor (1994), *Pension and Health Benefits of American Workers*, Washington, DC, GPO.
- Venti, S., and Wise, D. (1998), 'The Cause of Wealth Dispersion at Retirement: Choice or Chance?', *American Economic Review, Papers and Proceedings*, 88, 185–91.
- — (2000), 'Choice, Chance, and Wealth Dispersion at Retirement', NBER Working Paper No. 7521.
- Warshawsky, M., and Ameriks, J. (2000), 'How Prepared Are Americans for Retirement?', in O. Mitchell, P. Hammond, and A. Rappaport (eds), *Forecasting Retirement Needs and Retirement Wealth*, Philadelphia, PA, University of Pennsylvania Press, 33–67.
- Yakoboski, P., and Dickemper, J. (1997), 'Increased Saving but Little Planning: Results of the 1997 Retirement Confidence Survey', *EBRI Issue Brief*, 191(November).