THE ECONOMIC ROLE OF ANNUITIES

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SUMMARY

Annuity contracts are unique saving vehicles that provide a framework for managing both the accumulation and the payout phases of an investment. In their simplest form, annuities guarantee, in exchange for an initial capital payment, a periodic payout for the remainder of an annuity owner's life.

Under current law, all annuity contracts—both qualified and nonqualified—allow the investor to defer taxes on earnings credited under the contract. Qualified annuities (e.g., annuity contracts purchased through a 401(k) or 403(b) pension plan or an individual retirement account) also allow the deferral of income taxes on principal invested in the annuity. Consequently, investments through annuities generally provide higher after-tax rates of return than do investments made outside of annuities.

Sales of qualified and nonqualified annuity contracts have grown rapidly over the past 10 years, outpacing the sales growth of other financial products such as mutual funds and life insurance. This trend is largely attributable to provisions that allow earnings within an annuity account to accumulate tax-free. Thus, the elimination of these tax provisions would be expected to lead to a significant decrease in the demand for annuities and a corresponding decline in the nation's saving rate.

A decline in the United States' saving rate is highly undesirable—especially at this time. U.S. households currently save relatively little, by both historical and international standards. The net national saving rate in the United States has fallen from an historical average of more than 9 percent of gross domestic product in the 1960s and 1970s to an average of less than 5 percent in the 1980s and 1990s. This substantial decline in the saving rate has made the financing of investment more difficult and has contributed to reductions in the growth of productivity, wages, and household income in the United States.

The importance of saving and of maintaining an environment that supports a wide variety of market-driven saving and insurance vehicles will grow in the years ahead, due largely to increases in life expectancy. The fastest-growing segment of the population will be the elderly and, among them, the very old.

The economic implications of this transition will be far-reaching. The two largest government programs that provide for the elderly, social security and medicare hospital insurance, have serious long-run actuarial problems, with projected benefits exceeding projected receipts by trillions of dollars. Unless changes are made in these programs soon, the tax increases and/or benefit cuts necessary to bring these systems into balance will be wrenching.

A major contributor to the low saving rate in the United States is the present tax system, which favors current consumption and debt at the expense of saving. Therefore, efforts to reverse the historical decline in saving must include government policies designed to encourage increased retirement savings. Annuities provide a particularly appropriate focus for such policies.

Policymakers should consider more tax incentives to encourage savings. Certainly, opportunities for tax deferral through annuities should be continued, as their elimination would fly in the face of efforts to stimulate saving. Tax-deferred annuities provide investors with powerful incentives to save.

THE ECONOMIC ROLE OF ANNUITIES

SECTION 1/ INTRODUCTION AND OVERVIEW

Households accumulate long-term savings through a variety of financial vehicles. Alternatives range from employer-provided pensions to direct purchase of corporate equities, to purchase of whole life insurance, and to putting money in the bank. One increasingly important option is the purchase of annuities. These centuries-old vehicles come in many forms. Generally, annuity contracts package a savings account with a mechanism for managing the rate at which resources are withdrawn once disbursements commence. This mechanism allows the individual to insure against the risk of outliving his or her resources, to guard against inadvertent overspending, and to provide a financial cushion for survivors in the event of premature death. The importance of annuities has grown through time, as trends toward early retirement and tremendous gains in the life expectancy of the elderly have lengthened the average retirement period, raising the risks associated with premature depletion of financial resources.

In recent years, annuity markets have grown rapidly. Premiums for annuities now exceed life insurance premiums received by insurance companies. According to the *1997 Life Insurance Fact Book*, 32 million Americans have individual annuity contracts, and 20 million are covered by group annuities as part of their employer-based pension plans. These figures include qualified and nonqualified annuities. The most widely used types of annuities allow accumulation of assets (inside buildup) on a tax-deferred basis, an advantage shared by several other long-term retirement saving vehicles, such as individual retirement accounts (IRAs), employer-provided pensions, and employee-driven pensions such as 401(k) and 403(b) plans.[1] Section 401(k) and 403(b) plans, of course, often make use of annuities as the preferred investment vehicle. Thus, annuities are increasingly important in household decisions regarding private saving and investment.

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[1] This advantage is also shared by many capital assets, such as real estate and individual shares of stock, since taxes are paid on capital gains only at the time of realization. However, annuities and the other long-term retirement saving plans mentioned in the text are more flexible than these other capital assets because they allow the investor to adjust the underlying investment portfolio without incurring tax liabilities.

The deferral of taxes on annuity income is justified by widespread concern over the adequacy of saving. As Figure 1.1 indicates, the net national saving rate in the United States has fallen dramatically from historic averages of over 10 percent of gross domestic product in the 1960s to a rate of just over 4 percent in the 1990s. National saving is the sum of what households, businesses, and all levels of government save or, in the case of borrowing, dissave. The overall saving rate can, therefore, be decomposed into separate saving rates for each of these categories. This decomposition is shown in Figure 1.2. The decline in the net national saving rate from 10.7 to 4.1 percent of gross domestic product from the 1960s to the 1990s can be attributed to a reduction in each of the major components of saving—personal, corporate, and government.[2]

The net U.S. saving rate has fallen dramatically from historic averages of over 10 percent of GDP in the 1960s to a rate of just over 4 percent in the 1990s

Saving is critical to the health of the U.S. economy because it is the primary source of the funds that business enterprises use to finance domestic investment. New investments are necessary to equip workers with productivity-enhancing capital. A newer and larger capital stock allows each worker to be more productive and leads to both a greater growth rate for the economy and higher wages for those using this capital. Domestic investment can, of course, also be financed by importing foreign capital, but experience demonstrates that inflows of foreign capital do not fully make up for low levels of domestic saving. Thus, the substantial decline in the saving rate has made the financing of investment much more difficult and has, no doubt, contributed to reductions in the growth of productivity, wages, and household income. Inadequate rates of saving over the past 15 years have limited gains in living standards for U.S. households, and continued weak saving poses an even greater threat to the future prosperity of our nation.

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[2] The measures of saving and national product considered here are net of capital consumption allowances for the depreciation of physical assets. This is appropriate, since depreciation amounts to negative saving.

If domestic saving were to increase, U.S. interest rates would fall, and this would reduce the rate of foreign investment in the United States; however, total domestic investment would increase, bringing a variety of economic benefits. Numerous studies demonstrate that a greater pace of capital formation leading to a larger and newer capital stock per worker will increase productivity, which is the foundation for wage increases. Although other pillars of economic growth—sound money, new technology and ideas (which also must be financed), more and better-quality education, improved resource allocation, and a myriad of other microeconomic phenomena—are important, the sizable effect of capital formation on economic growth is the most thoroughly documented.

The potential benefits of increases in economic growth are enormous. A sustained GDP growth rate of 2.2 percent (as currently projected by the Congressional Budget Office) would increase the size of the U.S. economy by 129 percent between 1998 and 2035. A GDP growth rate of 3.2 percent would expand the economy by over 230 percent over this same time period. Thus, a 1 percentage point increase in the growth rate (3.2 percent versus 2.2 percent) would increase the size of the U.S. economy in 2035 by an amount roughly equal to current GDP! Even half a percentage point increase in the growth rate, compounded over a generation, can make the difference between a society that views itself as successful and one that views itself as feeble.

Just as adequate saving is essential for healthy macroeconomic performance, it is also critical to the economic well-being of individuals and families. Saving is the method by which households can reallocate resources over time and across uncertain contingencies. Households often save to finance consumption during retirement or to pay for large, infrequent expenditures such as a down payment on a home or a child's education. Saving is also a type of insurance, as it provides a financial reserve against adverse developments. This "precautionary" saving complements traditional forms of insurance that protect against a variety of contingencies, from illness to temporary labor market dislocations. Yet most Americans currently save far too little to ensure income adequacy during retirement or to weather adverse developments without considerable financial distress.

The existing tax system favors current consumption and debt at the expense of saving

Despite the obvious importance of saving to the long-run growth of the economy and to the economic well-being of individuals and families, the existing tax system favors current consumption and debt at the expense of saving. Taxes on nominal capital gains and interest income drive a wedge between the cost of capital paid by those using saving to finance new investment and the after-tax rate of return that the saver receives. For an individual making consumption decisions over a long time horizon, these taxes on saving, and thus future consumption, distort the individual's decisions, making present consumption more attractive than it would otherwise be. Saving vehicles such as annuities, which allow the accumulation of assets on a tax-deferred basis, help ameliorate this distortion.

The importance of saving, and of maintaining an environment that supports a wide variety of market-driven saving and insurance vehicles, will grow in the years ahead. Figure 1.3 shows the historic and projected future trends in the life expectancy of a 65-year-old woman. In 1940, the average 65-year-old woman was expected to live approximately another 13.5 years to the age of 78. By 1995, the corresponding life expectancy had risen to the age of 84—a gain of more than a month in life span for each calendar year. By 2070, according to the high projections of the Social Security Administration, a 65-year-old woman could expect to live past the age of 90, almost twice the additional number of years as the average 65-year-old woman in 1940. In the years ahead, the fastest-growing segments of the population will be the elderly—most of whom will not be in the workforce—and, among the elderly, the very old. These changes will have a dramatic effect on the ratio of the retired population to the working-age population, as shown in Figure 1.4. Although the nation has been on something of a demographic holiday, with the elderly dependency ratio increasing only slightly since 1980, in a few years this ratio will start to rise inexorably. By 2030 this ratio will stand at approximately 36 percent, almost double the current ratio. Under the intermediate assumptions of the Social Security Administration, the United

States will go from one retiree for every 3.3 workers to one retiree for every 2.1 workers.

The economic implications of this demographic transition will be far-reaching. Figures 1.5 and 1.6 show financial projections for the two largest government programs that provide for the needs of the elderly. Both programs have serious long-run (in the case of hospital insurance, also short-run) actuarial problems. Projected benefits exceed projected receipts by trillions of dollars, and unless changes in these programs are made soon, the tax increases and/or benefit cuts necessary to bring these systems into balance will be wrenching. Table 1.1 shows the projections of the Congressional Budget Office (as of March 1997) for the federal budget deficit if fundamental changes are not made to the social security and medicare systems. Although deficits are projected to be only 2 percent of gross domestic product through 2005, they are expected to rise dramatically as the baby boom generation retires. The projections for 2035 range from 10 to 28 percent of GDP, depending on the economic assumptions used by the Congressional Budget Office. In light of these projections, even greater urgency attaches to the task of raising private saving, since this would reduce the pressure on the social security and medicare programs as well as on the federal budget deficit.

Social security and medicare hospital insurance have serious long-run actuarial problems

In short, the United States stands at the threshold of the most stunning demographic change in its history. Increased retirement saving and more-rapid economic growth are plainly required if adequate support is to be provided for the growing population of elderly and retired individuals.

To some extent, it is possible to raise the rate of national saving by reducing government budget deficits. However, budgetary policy alone will not suffice; steps must be taken to reverse the historical decline in private saving. The relationship between private saving and the budget deficit is important because some proposals to

reduce the deficit would also reduce private saving; indeed, this is exactly what occurred in the 1990 and 1993 budget accords that limited contributions to tax-deferred savings accounts, as well as in the 1993 tax rate increases. Raising the nation's saving rate requires us to reduce the budget deficit in ways that do not harm private saving and/or to raise the private saving rate in ways that do not worsen the budget deficit.

Because of their unique characteristics, annuities provide a particularly appropriate focus for policies to encourage saving and promote retirement income security. Surprisingly, however, annuities do not appear to be well understood by the general public or some policymakers. Indeed, episodic proposals to limit the amount, or eliminate the tax deferral, of annuities fly in the face of the obvious importance of raising the saving rate and encouraging annuitization. The purpose of this study is to provide an accessible explanation of the economic role, both current and prospective, of annuities.

Toward this end, Section 2 describes the various types of annuities. It explains how they work and the needs they address. It also documents the growing importance of annuities as vehicles for saving and insurance, and explores the explanations for this growth. Section 3 elaborates on the macroeconomic importance of saving, and places current rates of saving in both historical and international contexts. Section 4 discusses the importance of saving to individual households, focusing on the adequacy of retirement saving and the effects of the demographic transition. Section 5 concludes with policy issues and options. Strategies to raise both public and private saving are considered. The provision of economic incentives through tax-deferred annuities is compared with other methods of encouraging private saving.

It is important to retain the tax-deferred status of annuities and to avoid the imposition of limits on annuity contributions

As a general matter, then, it is important to retain the tax-deferred status of annuities and to avoid the

imposition of limits on annuity contributions. Public policy toward saving in general, and annuities in particular, should make providing for their own financial needs as easy as possible for future retirees.

SECTION 2/ UNDERSTANDING ANNUITIES

To develop a comprehensive financial plan for retirement, an individual must address two separate (but highly interrelated) types of questions. Questions of the first type focus on decisions taken prior to retirement, in the *accumulation* phase: How much must I save each year to accumulate an adequate nest egg by the time I retire? How should I invest my savings? Questions of the second type concern decisions taken after retirement, in the *liquidation* phase: Should I conserve my principal and live off capital income, or should I sell assets to finance my living expenses? Should I plan to downsize my house? What should I allocate to my heirs?

Financial institutions provide a broad array of products and services designed to facilitate this difficult planning process. Numerous vehicles for long-term saving, ranging from bonds to mutual funds to life insurance policies, compete for the attention and resources of the typical household investor. Annuities are unique within this broad class of saving vehicles in that most competing products focus on accumulation and provide no framework for managing liquidation. In contrast, the structure of annuities contemplates *both* of the retirement planning problem's phases: accumulation *and* liquidation.

This section traces the recent growth of annuity markets, elaborates on the distinctive economic role served by annuities, and explores the factors that have contributed to their growth, including tax provisions. Describing annuity contracts in somewhat greater detail is useful before delving into these subjects.

TYPES OF ANNUITIES

Annuity contracts can differ substantially with respect to the manner in which assets are acquired and benefits are paid out. Some of these differences result from the legal rules that govern eligibility for tax deductibility of contributions. Most of the differences in contractual forms, however, simply reflect the range of options demanded by annuity owners for managing both the accumulation and liquidation phases of an annuity contract. In this section, annuities are classified along several important dimensions. These are summarized in Table 2.1.

Ownership and Control

Annuities can be either *group* or *individual* contracts. This distinction reflects the legal status of ownership and control (whether the individual for whom the annuity is purchased legally controls the annuity) and is not specifically related to either the accumulation or liquidation phases of the contract. Group annuities are purchased for a group of individuals by a third party, usually an employer. In this case, the employer retains the rights to control future investments into the annuity and to terminate the annuity contract. Group annuities are often an integral part of employer-provided defined benefit pension plans, but they are also used in defined contribution plans, such as 401(k) or 403(b) plans, when employers wish to retain some control. Individual annuities, on the other hand, consist of all annuity contracts where the rights of ownership and control of the contract remain with the individual who purchases the annuity. These include annuities held outside of pension plans, as well as many investments made within employee-driven defined contribution pension plans.

Accumulation Phase

Annuities provide investors with a number of options during the accumulation phase. One important dimension of flexibility concerns the timing of contributions. *Single-premium* annuities are purchased through a single payment to the insurer. *Periodic-premium* annuities are typically characterized by a longer accumulation phase, during which periodic payments are made to the annuity provider. Annuities with periodic premiums are commonly used in the context of 401(k), 403(b), and other pension plans (although, in some cases, participants have the option of instead purchasing single-premium annuities upon retirement). In most cases, the periodic payments are flexible and are often withheld directly from an individual's paycheck.

In the case of periodic-premium annuities, the payouts from the insurer to the annuitant are almost always *deferred*. That is, the liquidation phase of the annuity is not scheduled to begin until some time in the future, naturally after the periodic premiums end. In general, single-premium annuities can be either *immediate* or deferred. On the one hand, a single-premium annuity may be purchased at the time of retirement by an individual who wants to transfer retirement savings into an annuity to insure against the possibility of outliving his or her assets. Since this annuity is

purchased just as retirement is beginning, payouts often begin immediately. On the other hand, a 35-year-old individual who wishes to take advantage of the various features that annuities offer, including tax deferral, might purchase a single-premium annuity and defer the payouts until he or she retires 30 years later. Thus, in general, a periodic-premium annuity will be deferred, and a single-premium annuity can be deferred or immediate.

In an annuity's accumulation phase, account balances can be invested in a variety of ways. A *fixed* annuity provides a guaranteed, contractually specified return on account balances; a *variable* annuity provides variable returns as determined by investment performance. Through variable annuities, the investor has considerable flexibility to customize an investment portfolio. For example, a variable annuity contract might offer a choice of mutual funds, and the individual would then receive a return on account balances based on the performance of his or her chosen funds. The underlying investment opportunities actually offered through variable annuities are extremely varied. As will be discussed in the next section, a variable annuity contract can continue to earn income based on an underlying investment portfolio during the liquidation phase of the annuity contract.

Some annuities combine the features of variable and fixed instruments. An example is the *equity indexed* annuity (EIA). Developed in the last couple of years, an EIA provides some participation (usually not full) in equity markets while limiting downside risk. An EIA typically guarantees a minimum rate of interest and then credits excess interest based on an outside index such as the S&P 500. The amount credited depends upon the performance of the index, the period over which the performance is measured, and the participation percentage (the percentage of the index credited to the EIA).

All capital income accumulated within an annuity contract owned by individuals (inside buildup) is free from immediate taxation. Instead, taxes are paid at the time these earnings are withdrawn during the liquidation phase. Although all annuity contracts allow the deferral of taxes on accumulated capital income, *qualified* annuities also allow the additional deferral of income taxes on the money used to

All annuity contracts allow the deferral of taxes on accumulated capital income,* qualified *annuities also allow the additional deferral of income taxes

purchase the annuity. Qualified annuities are purchased through a retirement plan, such as employee-driven 401(k) and 403(b) pension plans and individual retirement accounts (IRAs). Group annuities purchased by an employer for a defined benefit pension plan are also generally qualified. *Nonqualified* annuities are not purchased through a qualified pension plan and do not allow the deferral of income taxes on the initial purchase price. Instead, investors pay their annuity premiums with after-tax dollars. A more detailed discussion of the tax treatment of annuities appears later in this section.

Annuities purchased through qualified pension plans (e.g., 401(k) plans, 403(b) plans, and IRAs) offer a higher after-tax rate of return than do comparable nonqualified annuities. However, yearly contributions to these qualified contracts are subject to an upper limit; the amount that can be saved through nonqualified annuity contracts has no such limit. Thus nonqualified annuities can be valuable to individuals who wish to save a large amount quickly, even if they have access to qualified pension plans. In particular, nonqualified annuities can be an attractive saving vehicle for individuals who did not save sufficiently early in their working lives and need to save a large amount just prior to retirement. As will be discussed later, many members of the baby boom generation may soon find themselves in this situation.

Nonqualified annuities are also useful for those who receive large sums of money, perhaps from the proceeds of a life insurance policy or the sale of a home, farm, or business. According to the most recent Gallup (1997) *Survey of Owners of Nonqualified Annuity Contracts*, 51 percent of owners used money from one-time events to purchase their annuities.

Since annuity contracts offer a range of options for managing capital accumulation as well as the deferral of taxes, they can be attractive saving vehicles even for individuals who have no interest in contractual options for managing payouts during the annuity's liquidation phase.

Liquidation Phase

Annuities provide investors with a variety of options for managing distributions during the liquidation phase. Most annuity contracts, called *income* annuities, convert accumulated assets or a single premium into streams of income. Of course, an owner may decide to surrender his or her contract before the stream of income begins and, in doing so, receive the entire value of the annuity contract in a single payment. An annuity contract might be surrendered by an investor who concludes that he or she no longer needs or wants a stream of income.

The simplest form of an income annuity is a *life* annuity, which provides a regular payment for the life of the annuitant. The size of the periodic (typically monthly) benefit paid by a life annuity is based primarily on the life expectancy of the annuitant. For example, in 1995, for an initial $100,000 investment, a 65-year-old man would have received monthly payments of approximately $794.[3] This payment is based on the life expectancy of a 65-year-old man as well as on other economic factors such as interest rates. A younger man or a woman of the same age would have received smaller payments for the same initial investment, owing to a greater life expectancy. Specifically, a 55-year-old man would have received $664, and a 65-year-old woman would have received $717.

The simple life annuity can be modified in two ways that allow for the possibility of further payments upon the death of the annuitant. Naturally, such modifications affect the size of the periodic income stream generated from any given annuity investment.

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[3] The payout data for the examples in this paragraph are derived from the July 1995 edition of *Best's Review.* The payments are averages across all insurance companies, as calculated in Mitchell, Poterba, and Warshawsky (1997).

Guaranteed annuities pay income for either the life of the annuity owner or a fixed number of years, whichever comes last.[4] Through the use of such contracts, individuals can guard against the possibility that they might die soon after the inception of benefits, before they have recouped a significant fraction of their contributions. The guarantee is valuable to individuals who wish to provide resources for heirs or survivors but offers no benefit to those concerned solely with providing themselves with retirement income.

Guarantees come at the cost of smaller monthly payments. The size of the reduction in monthly payments depends, of course, on the probability that the annuitant will die before the guarantee period is over. A young annuitant, less likely to die before the guarantee period is over, can purchase the guarantee at a lower incremental cost (in terms of forgone monthly income) than an older annuitant can. Consider, for example, a 10-year certain annuity, which, as the name suggests, guarantees payments for at least 10 years. A 50-year-old annuitant must give up roughly 1 percent of the monthly payment to secure this guarantee, and a 75-year-old must sacrifice roughly 12 percent of his or her benefit.[5] Thus, the cost of a guaranteed annuity is related directly to the life expectancy of the annuitant.

The annuitant has another option that allows for the possibility of further payments upon his or her death: a *joint-and-survivor* provision. This type of annuity pays a stream of income for a period of time that depends on the lives of both the annuitant and another individual (usually the annuitant's spouse); monthly payments continue until the deaths of both individuals. Generally speaking, the use of joint-and-survivor annuities has increased dramatically since the passage of the Retirement Equity Act of 1984 (REA), which provided that married employees under plans governed by the Employee Retirement Income Security Act (ERISA) can elect a single-life annuity only if the spouse agrees in writing to forgo the two-life benefit (King 1996).

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[4] In fact, guaranteed annuities are really just a special form of a more general class of annuities known as *refund* annuities. A refund annuity ensures that a specified portion of the purchase price of an annuity will be paid to the annuitant or a beneficiary regardless of when the annuitant dies. The size of the regular payment is inversely related to the size of the guaranteed amount.

[5] These percentage declines are based on Federal Retirement Thrift Investment Board, *Thrift Saving Plan Annuities*, Office of Personnel Management, January 1996.

As in the case of the guaranteed annuity, the joint-and-survivor option increases the expected number of monthly payments and therefore comes at the cost of lower benefits. For example, a 65-year-old man would reduce his monthly benefit approximately 13 percent by electing the joint-and-survivor option for his 65-year-old wife. If his spouse is younger, the reduction would be greater, as she can be expected to live even longer. If, say, the spouse is only 55, the reduction in monthly payments would be closer to 20 percent.[6]

The preceding figures assume that the survivor's benefit is equal to the full amount of the initial monthly payment. However, some annuities provide reduced payments to the survivor. These contracts are structured in a variety of different ways. Some provide fractional benefits (usually one-half or two-thirds) to any survivor, regardless of whether the survivor is the primary or secondary annuitant. Others provide full benefits to the primary annuitant upon the death of his or her spouse but fractional benefits to a surviving secondary annuitant. Naturally, all these annuities have higher initial monthly payouts relative to contracts that provide full benefits to survivors. Fractional survivor benefits are appealing to many annuitants because one individual normally requires less income to achieve a given material standard of living than two individuals do.[7]

Other life annuity options provide investors with the ability to select payment streams that provide a hedge against a reduction in purchasing power due to inflation. Figure 1.3 implies that many individuals can expect to live more than 20 years in retirement.

Over such a long time, even a modest rate of inflation can seriously reduce the purchasing power of the dollar.

To some extent, investors can counter the inflationary erosion of their purchasing power through the use of variable annuities. The returns to some variable annuity

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6 These percentages are also based on the Federal Retirement Thrift Investment Board, *Thrift Saving Plan Annuities*, Office of Personnel Management, January 1996.

7 There are, of course, exceptions to this principle, as when one spouse is fully or partially disabled and the other acts as caregiver. Were the second spouse to die, the first might actually require a greater monetary income.

To some extent, investors can counter the inflationary erosion of their purchasing power through the use of variable annuities

investments are based on the performance of an underlying investment portfolio both in the accumulation phase and in the liquidation phase. Since higher inflation generally leads to higher nominal investment returns, payments to the annuitant can keep pace with inflation during liquidation.[8]

Many other payment options are available to annuitants. Annuity payments can be *flat*, fixed in nominal terms for the life of the contract, or *graded*, increasing gradually over time according to a schedule of payments. Graded payments offer some protection from inflation but rarely are directly indexed to the inflation rate. Naturally, the annuitant must accept a lower initial benefit (relative to payments for a flat stream) to obtain a graded payout stream. This may appear unattractive to an individual who expects his or her material needs to decline with age. For whatever reason, graded schemes have, to date, achieved only limited commercial success. For example, only 11.7 percent of TIAA annuitants elected graded options in 1994. This figure was, however, up significantly from 1990, when it stood at only 6.6 percent (King 1996).

The absence of indexation reflects the fact that, until recently, insurance companies were unable to hedge inflation risk adequately. The issuance of indexed bonds by the U.S. Treasury will no doubt enhance the economic potential for the indexation of many financial contracts, including annuities. Whether investors will be attracted to indexed annuities despite lower initial payments (as with graded annuities) remains to be seen. However, since elderly households tend to voice concern over the possibility that inflation could erode the purchasing power of their retirement incomes, there is every reason to believe that indexation will considerably enhance the appeal of annuities.

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[8] See Mackey (1997) for a more detailed discussion.

One special form of annuity contract, the *reverse annuity mortgage,* allows homeowners to convert home equity into a regular income stream for the duration of their lives. Reverse annuity mortgages operate in much the same way as an immediate, single-payment annuity. The equity in the home serves as the initial investment. The annuitant receives a periodic cash benefit and continues to live in the house until his or her death. For the same initial investment, a reverse annuity mortgage generates a smaller income stream than a standard annuity; the difference corresponds to the rental value of the house.

Many U.S. households could potentially benefit from reverse mortgages. Home equity has traditionally represented the largest single category of wealth for the majority of elderly households (Jacobs and Weissert 1987). According to the 1989 American Housing Survey, over 10 million elderly individuals who owned a home had incomes below $30,000 (Klein and Sirmans 1994). For individuals in this segment of the population, the house usually accounts for the lion's share of net worth. In the absence of reverse annuity mortgages, elderly individuals can convert home equity to cash only through second mortgages (which are often difficult to obtain after retirement) or through sale and relocation. Klein and Sirmans (1994) estimate that the reverse annuity mortgage program of the Connecticut Housing Finance Authority increased the average income of participants by 88 percent.

Although the potential benefits of reverse annuity mortgages are great, their use has been limited by a number of factors. Many elderly are reluctant to enter into nontraditional contracts, particularly financial arrangements affecting their homes. Reverse annuity mortgages may also be perceived as contrary to traditional norms of keeping the family home free of debt. There is also evidence that most individuals regard home equity as a nest egg of last resort, to be used in case of emergency, rather than as a source of funds for financing ordinary living expenses during retirement (see the related discussion in Section 4). In practice, reverse annuity mortgages have not been widely used.

Investments through annuities generally provide higher after-tax rates of return than do investments made outside of annuities

The Tax Treatment of Annuities

Whether qualified or nonqualified, an annuity allows the investor to defer taxes on all dividends and capital gains accumulated within the contract. Instead of paying tax liabilities when this income is received, the annuity owner can postpone payment until the liquidation phase of the contract. Meanwhile, funds that will ultimately be used to pay the deferred taxes generate additional earnings for the owner.[9] As a result, investments through annuities generally provide higher after-tax rates of return than do investments made outside of annuities.

The size of the tax benefit associated with annuity investments depends upon current and future tax rates, as well as on the tax rules that apply during liquidation. All taxable withdrawals from annuities are treated as ordinary income rather than as capital gains (which are taxed at a lower rate). In the case of a qualified annuity, all withdrawals are taxable, since the annuity owner has not yet paid taxes on the income that was used to make contributions or on any of the capital income generated within the contract. In the case of nonqualified annuities, only a portion of each withdrawal is taxable, since the annuity owner has already paid tax on the income that was used to make contributions. The rules for calculating the taxable portion of a distribution from a nonqualified annuity depend on the distribution method the annuity owner elects. The following two examples illustrate some alternatives.

Suppose first that an investor elects to withdraw the entire value of a nonqualified annuity in a lump sum. Taxes are then assessed on the difference between the amount received and the sum of all premiums paid during the life of the contract. In other

[9] The annuity owner can transfer money from one investment subaccount to another within the annuity contract without incurring current tax liabilities on realized capital gains. An individual who transfers money between investments outside of annuity contracts (e.g., between mutual funds) must often pay taxes immediately on any capital gains, even if all proceeds from the sale are reinvested.

words, the annuitant's taxable income does not include the portion of the lump-sum distribution reflecting contributions that were made with after-tax dollars.

Next, suppose that investor elects a flat, single-life annuity. In that case, the taxable portion of a payment is calculated by excluding imputed withdrawals of principal, where it is assumed that the withdrawals occur at a constant rate over the course of the individual's life expectancy at the time of annuitization. Thus, the taxable portion of each payment depends on life expectancy and age. To illustrate, imagine that payments begin at age 65. Based on the unisex life expectancy tables used by the IRS, the annuity owner can expect to live for an additional 20 years. Consequently, for the first 20 years after benefits commence, taxes are assessed on the difference between the amount received and 1/20 of the sum of all premiums paid during the life of the contract. If the individual should live past his or her life expectancy (age 85 in this example), annuity payments become fully taxable.

One way to quantify the tax benefits of annuity products is to compare the after-tax payouts from identical mutual fund investments within an annuity contract and outside of an annuity contract. A recent study by Price Waterhouse (1997) undertakes comparisons of this type. The study uses historical data on the performance of mutual funds and on investor behavior (including the frequency with which individuals realize capital gains by rolling funds from one investment into another). If an individual intends to accumulate an initial investment of $1,000 for a period of 20 years and then withdraw the entire balance in a lump sum, the use of an annuity increases the after-tax payout by $1,852. If the individual intends to withdraw the balance over the duration of his or her life, the after-tax gain from using an annuity rises to $8,770. This is because longer payout periods increase the number of years that taxes are deferred and shift taxable income to years in which the individual will probably pay income taxes at lower rates (because of an expected decline in income).

Since all taxable withdrawals from annuities are treated as ordinary income, capital gains earned within annuities may be taxed at a different (typically higher) statutory rate than are capital gains earned outside of annuities. For investments that tend to generate capital gains (as opposed to dividends or interest income), a reduction in the

capital gains tax rate can reduce the net advantage of investing in a variable annuity. The Taxpayer Relief Act of 1997 has reduced the applicable federal capital gains tax rates for many investors and ensured that the marginal capital gains tax rate on assets held for at least 18 months is always less than the individual's marginal tax rate on ordinary income; thus, the act probably reduces the relative attractiveness of annuities for some investors. However, the after-tax advantages of investing in annuities, cited in the previous paragraph, reflect the new tax law. Price Waterhouse estimates that, prior to the act, the benefits of annuities were 10 to 18 percent higher than the benefits from investments in similar mutual funds, depending on the method of distribution. As stated in the paragraph above, the Price Waterhouse study shows that these benefits remain substantial even under the new law.

THE GROWTH OF COMMERCIAL ANNUITIES

Commercial annuity markets in the United States have grown rapidly over the past two decades. Total annuity premiums leaped from $10.2 billion in 1975 to $83.7 billion in 1986 to $159.9 billion in 1995, for an annual compound growth rate of nearly 15 percent. Even after adjusting for inflation, the annual growth rate of annuity premiums is still high—about 9 percent.

Historically, sales of group annuities have accounted for the majority of annuity transactions. In 1973, group annuity sales made up more than 75 percent of the total annuity market. Even as late as 1986, the market share of group annuities remained in the neighborhood of 70 percent. By 1996, however, this share had fallen to only 48 percent. Over the past 20 years, group annuity sales have grown at a rapid rate—about 13 percent per year. During this same period, however, sales of individual annuities surged from $2.7 billion in 1975 to $20.9 billion in 1985 to $77.4 billion in 1995, for an annual compound growth rate of more than 18 percent. Table 2.2 shows the total, group, and individual annuity premiums for the years 1975 to 1995.

The rapid expansion of the market for individual annuities has been fueled by growth in both qualified and nonqualified annuity purchases. Qualified annuities purchased through 401(k) plans, 403(b) plans, individual retirement accounts (IRAs), and other similar accounts have increased rapidly over the last decade, but the growth of

nonqualified annuity contracts has been even more impressive. Nonqualified individual annuity purchases rose from approximately 30 percent of the individual annuity market in 1986 to more than 50 percent in 1994 (Gareis 1996).

Statistics on individual annuity purchases can also be decomposed into sales of variable and fixed annuities. In 1985, variable annuities made up only 18 percent of the individual annuity market; by 1995, this share had grown to 53 percent. Over that 10 years, variable annuities grew at an average rate of 29 percent, but fixed annuities grew at a rate of only 8 percent. Sales of fixed annuities actually fell slightly from 1990 to 1995, whereas variable annuity sales almost tripled (Hammond 1996).

Qualified annuities have increased rapidly over the last decade, but the growth of nonqualified annuity contracts has been even more impressive

The growth in the variable annuity market can also be seen through trends in the number of companies offering these products. In 1980 only 6 companies offered variable annuities to individuals. This number grew to 34 in 1985, 73 in 1990, and 104 in 1995, with more than 6 new firms entering the variable annuity market in the average year (Hammond 1996). These patterns indicate that annuity markets are highly competitive. Healthy competition is important because it holds prices close to costs, thereby stimulating consumer demand. Thus, although annuities sometimes are expensive relative to other investment products (such as directly held mutual funds), the cost of an annuity to the customer is driven primarily by the cost of the annuity to the insurance company that issues it. These costs may differ from those associated with other saving vehicles because annuity contracts embody a distinct package of features.[10]

[10] The average expense for variable annuities is 2.16 percent of net assets for load annuities and 1.58 percent for no-load annuities (Morningstar Variable Annuities/Life, March 31, 1997). Load annuities differ from no-load annuities in that they charge an additional up-front sales fee. Traditionally,

Further decompositions of annuity sales help to illustrate the engines of growth in this market. Qualified variable-annuity purchases have risen at a rate of 23 percent over the past 10 years; nonqualified variable annuities grew at an even faster rate of 48.2 percent. Relative rates of growth for qualified and nonqualified fixed annuities followed a similar pattern, though their absolute growth rates were smaller. Consequently, the growth of annuities has not been driven solely, or even primarily, by qualified pension plans (Hammond 1996).

The growth of variable annuities reflects more than just the emergence of preferences for mutual fund investments

As the preceding discussion makes clear, annuity markets have sustained dramatic compound growth for more than two decades. In part, this phenomenon reflects a more fundamental shift in the ways U.S. households store and accumulate wealth. Over the same two decades, households have become increasingly disenchanted with traditional forms of saving (passbook accounts, certificates of deposits, saving bonds, and the like) and increasingly attracted to riskier securities with higher expected returns, particularly through investments in mutual funds. In light of this observation, it is instructive to compare the growth of the annuities market—and variable annuities in particular—with growth in other segments of the securities market. As noted above, the variable annuity market grew nearly 300 percent between 1990 and 1995. During this same period, the broader mutual fund market (which includes many of the investment vehicles underlying variable annuities) increased by about 150 percent (Hammond 1996). Thus, the growth of variable annuities reflects more than just the emergence of preferences for mutual fund investments.

insurance companies and stockbrokers have sold only load annuities. In June 1997, however, John Hancock Mutual Life Insurance became the first major insurer to offer a no-load variable annuity, joining about a dozen other companies, predominantly those associated with mutual fund groups (Dugas 1997).

Comparisons with traditional life insurance also help to illustrate the increasing importance of commercial annuities in the United States. One can base these comparisons on a number of different measures of economic significance. As a fraction of total payments made to policyholders by insurance companies, annuity payouts rose from only 15 percent in 1973 to 40 percent in 1993. During this same period, the share of life insurance company reserves attributable to annuities rose from 30 percent to 70 percent (Poterba 1997). This large relative increase in reserves suggests that future annuity payouts will rise even more dramatically in relation to traditional life insurance payouts. Thus, annuity growth has substantially outpaced the growth of traditional life insurance over the past two decades.

Trends in the size of annuity premiums relative to disposable personal income also document the growing economic importance of annuities. Table 2.3 tracks the ratio of both annuity and life insurance premiums to disposable income for the years 1973 to 1993. The percentage of disposable income devoted to annuity premiums soared from less than 1 percent in 1973 to 3.32 percent in 1993. At the same time, the ratio of life insurance premiums to disposable income fell steadily from 2.75 percent in 1973 to a low of 1.86 percent in 1992.

In summary, commercial annuity markets grew dramatically over the past two decades. Although each segment of the market expanded over this time period, the growth of individual annuities—especially variable and nonqualified contracts—has been the most striking. In particular, individual nonqualified variable annuities have grown at the remarkable average annual rate of nearly 50 percent over the last 10 years. The rates of growth in the annuity market and for variable annuities in particular have substantially outpaced growth in markets for related financial products such as mutual funds and life insurance.

WHAT'S BEHIND THE DEMAND FOR ANNUITIES?

The rapid growth of commercial annuity markets suggests that annuity products offer a unique package of features that is highly valued by household investors. What are these features? Why is the package unique? And what makes it so valuable? This section includes an exploration of the economic roots of the demand for annuities.

Also considered are the dual roles of annuities: as a means of managing the accumulation of retirement savings during the accumulation phase and as a means of managing payouts and ensuring against uncertainty concerning the timing of death during the liquidation phase.

Benefits of Annuities during the Accumulation Phase

For the most part, during the accumulation phase an annuity contract acts as a long-term saving vehicle.[11] Obviously, annuities compete with a variety of other financial products that can and do fill this same role. However, annuities are particularly attractive during the accumulation phase because they combine three important features: they embody opportunities for tax deferral, they provide the flexibility to structure an attractive portfolio of underlying assets, and they make it logistically easier for households to engage in long-term saving.

The rapid growth of commercial annuity markets suggests that annuity products offer a unique package of features that is highly valued by household investors

Annuities also provide the investor with the opportunity to lock the insurer into a guaranteed rate for converting accumulations into income. If rates go down prior to the start of the liquidation phase, the investor is protected; if rates go up, the investor gets the benefit of the higher rate. An investor who accumulates assets through other investment vehicles and purchases an immediate annuity at retirement is vulnerable to adverse movements in the rate of conversion.

As mentioned earlier, all annuities (whether qualified or nonqualified) allow the deferral of taxes on capital income accumulated within the contract. Moreover, individuals who purchase qualified annuities can defer income taxes on the money

[11] In fact, certain aspects of the accumulation phase, such as a guaranteed death benefit, operate like insurance.

used to make contributions. In general, this makes qualified annuities more attractive from a tax perspective. However, annual contributions to qualified retirement accounts are limited by statute, whereas contributions to nonqualified annuities are not. Individuals who begin consistently saving for retirement sufficiently early in life may find they can accumulate sufficient wealth without ever exceeding the contribution limits for qualified plans. However, many individuals neglect retirement until relatively late in their working lives and find themselves approaching retirement with little accumulated wealth. Although such an individual can still build a small nest egg by investing in qualified annuities, contribution limits rule out more substantial short-term accumulation. Though nonqualified annuities are not as attractive from a tax perspective, the absence of contribution limits offers individuals in this predicament the opportunity to make up for lost time by quickly saving large amounts.

These tax provisions create extremely important motives for purchasing annuities. In a 1997 Gallup poll, owners of nonqualified annuities were asked about the importance of various reasons for buying an annuity. The results of the poll are summarized in Table 2.4. The most important reason the respondents gave for purchasing an annuity was that the earnings would not be taxed until the funds were used—73 percent of respondents said this reason was "very important," and another 17 percent said this was "somewhat important." Notably, 84 percent of annuity owners reported that they had saved more money than they would have if the tax advantages of an annuity contract were not available.

Formal econometric analysis of historical data on annuity sales leads to more precise quantification of tax effects. Gentry and Milano (1996) have examined the relations between these historical patterns and variation in rates of income taxation both across states and over time. Their preferred method of analysis reveals that a 1 percentage point increase in marginal tax rates (applicable to capital income generally but not to the inside buildup on annuities) increases per capita individual annuity purchases by 4.3 percent. Also, the estimated effect of tax rates on annuity purchases depends on the age composition within the state. Taxes have larger effects on annuity sales in states where larger fractions of the population are approaching retirement. By

The elimination of tax deferral provisions for annuities would significantly depress annuity demand

inference, then, the elimination of tax deferral provisions for annuities would significantly depress annuity demand; moreover, the resulting reduction in saving through annuities would become increasingly severe as the baby boom generation neared retirement.

Annuities also offer a variety of investment options. Whereas fixed annuities give a specified guaranteed return, variable annuities allow contract owners to invest in a wide range of financial securities. Thus, household investors can use variable annuities to structure attractive portfolios of underlying assets, trading off risk against expected return entirely within the annuity contract while enjoying the full benefits of tax deferral. In the 1997 Gallup poll mentioned above, 86 percent of respondents said the rate of return offered by annuities was a "very important" or "somewhat important" factor in their decision to purchase an annuity.

Annuities also make it logistically easier for households to engage in long-term saving. As discussed in Section 5 of this paper, a growing number of the economists who research saving behavior have come to emphasize the psychology of self-control, as well as strategies for imposing self-control. According to this view, self-control is often accomplished through the formation of private "rules," the psychological division of resources into "mental accounts" (often reinforced through division into labeled physical accounts), and the development of habits. Since annuities are designed to facilitate the management of both accumulation and liquidation, they are particularly well suited for retirement saving; annuity investments are often automatically earmarked as retirement funds. Individuals may therefore find it easier to structure a long-term saving plan around a (nonqualified) individual annuity and to refrain from invading accumulated funds for other purposes. In the context of employee-directed pension plans (both qualified and nonqualified), individuals may also find it easier to impose self-discipline by electing to make contributions through automatic payroll deductions.

Many annuity contracts restrict withdrawals—for example, by imposing surrender charges if the accumulating capital is withdrawn early (a feature shared, of course, by a number of other financial products). In addition, withdrawals from annuity contracts made before the owner attains age 59½ are subject to a 10 percent federal tax penalty. These penalties reinforce the inclination to let funds accumulate. Naturally, such provisions may also be disadvantageous, since annuity purchasers run the risk of needing to withdraw funds or terminate contracts prematurely due to unforeseen circumstances. In the 1997 Gallup poll mentioned above, 91 percent of annuity owners reported that they try not to withdraw any money from their annuity contract before they retire, because they would have to pay a penalty.

The results of a Gallup poll confirm that annuities make it logistically easier for households to engage in long-term saving

More generally, the results of the Gallup poll confirm that annuities make it logistically easier for households to engage in long-term saving: 78 percent of the respondents replied that they had purchased an annuity because they wanted a long-term saving plan; 52 percent indicated that their annuity savings were primarily intended to provide retirement income; and another 11 percent said they intended to use the proceeds for daily living expenses (presumably, in most instances, during retirement). In addition, 76 percent characterized the ease of saving through annuities as an important feature.

Benefits of Annuities during the Liquidation Phase

Although annuities offer a unique package of attractive features for accumulating retirement funds, their most distinctive advantages over other long-term saving vehicles arise from provisions that facilitate the management of cash flows after retirement. Upon reaching retirement with conventional assets, a household must decide how to spread accumulated savings over subsequent years. If households wish to pass some of their savings on to their children or other heirs, they must also consider the desired form and magnitude of a bequest. Uncertainty about the age of death poses a particularly troublesome problem for individuals engaged in this

In their simplest form, annuities guarantee a periodic payout for the remainder of an annuitant's life in exchange for an initial capital payment

decision process. On the one hand, an individual who spends too much of his or her retirement savings in the first few years of retirement may be forced to accept a lower standard of living later on, particularly in the event of an unexpectedly long life. On the other hand, in choosing to spread savings over a long time horizon (e.g., by conserving principal), an individual may live too frugally, ultimately leaving a bequest that might seem excessive (relative to the desired bequest), particularly in the event of an unexpectedly early death.

Annuities were created to combat this fundamental difficulty. In their simplest form, they guarantee a periodic payout for the remainder of an annuitant's life in exchange for an initial capital payment. Through a life annuity, the retiree removes the economic effects of uncertainty concerning the timing of death, in the sense that a constant stream of income is ensured regardless of how long he or she lives. The annuity provider, usually a life insurance company, absorbs through diversification the risk of having to make payments to annuity owners who live longer than expected. It achieves diversification by providing annuity contracts to a large number of individuals. Some of these individuals die unexpectedly early, leaving extra resources to fund payments to annuity owners who live unusually long.

Ordinarily, life annuities offer higher rates of return than are available on conventional assets with similar risks. To understand why this occurs, consider the following simple example. A 65-year-old man reaches retirement with $100,000 in financial assets. Suppose this individual has a 5 percent chance of dying each year; to keep the example as simple as possible, imagine also that this probability does not increase as he ages. Several investment options are available to him. One is a safe bond, yielding a 5 percent rate of return for as long as the bond is held. Were our subject to invest his resources in the bond, he would obtain an annual income of $5,000. The other investment option is an annuity contract. The contract works as follows: the investor

hands cash to the insurance company, which buys the safe bond and pays a constant stream of income until the annuitant dies.

How much will the insurance company be willing to pay on our subject's $100,000 initial investment? Clearly, if it paid only $5,000, it would come out ahead, since all payouts would be covered exactly by investment income and since it would be entitled to keep the principal upon the annuitant's death. Competition between potential annuity providers would therefore compel the company to pay a higher return. How much higher? In effect, once it provides an annuity to our subject, the company has a 5 percent chance of receiving a $100,000 "windfall" every year.[12] If it writes a large number of similar contracts, then it will actually receive this windfall each year on 5 percent of its contracts. Thus, on average, the value of the windfall is $5,000 per contract, per year. With competitive insurance markets, insurance companies are forced to pass this value on to the annuitant (net of expenses). Consequently, the annuity contract would provide roughly $10,000 per year, or twice as much as direct investment in the bond even though it is based on the same underlying security.

Obviously, an annuity contract cannot create value out of thin air. What does the annuitant in the example give up to achieve this higher return? He sacrifices the ability to bequeath the principal of his $100,000 initial investment to his heirs. If the annuitant is not particularly concerned about leaving a bequest, then little real sacrifice is involved; the doubling of annual income from $5,000 to $10,000 more than justifies the cost. If the individual wishes to provide bequests to his heirs, this is best accomplished through investments in more conventional assets. However, for the portion of the individual's resources that he intends to consume during retirement, annuity contracts can still play an extremely useful role, eliminating all risk arising from uncertainty concerning the timing of death.

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[12] To understand why the $100,000 can be regarded as a windfall, think about the following hypothetical contractual arrangement. Suppose the individual places the $100,000 investment in an escrow account. All interest on the investment is paid to the insurance company. The insurance company is also named the beneficiary of this account in the event of the individual's death. In return, the insurance company makes an annual payment to the individual. From the point of view of the individual and the insurance company, this arrangement is equivalent to an annuity (abstracting from possible differences in tax treatment). Yet, upon the individual's death, the $100,000 investment is more clearly identifiable as a windfall to the company.

The annuity owner sacrifices the ability to bequeath principal to heirs

The preceding example is meant for illustrative purposes only; it is far too simplistic to provide a sense of the actual magnitude of the economic benefits flowing from annuities. However, estimates of these benefits can be found in the pertinent literature. Poterba and Wise (1996) use a simple theoretical model to predict the amount of wealth an individual should be willing to give up to have access to an actuarially fair annuity market. In their baseline case, they consider a 65-year-old man who is tolerant of risk, who is not concerned about bequests, and who discounts the future at a rate of 1 percent per year. The amount of wealth required by this man to achieve a given standard of living falls by 37 percent with the introduction of actuarially fair annuity markets (in comparison to an economy with no annuities). For individuals with less risk tolerance, this figure climbs even higher.

Of course, real annuity markets are not actuarially fair, for two fundamental reasons. First, the transactions costs an insurer incurs in the acquisition, investment, and management of its annuity contracts, along with any supracompetitive profits the insurer may make, must come out of the average payout annuitants receive.[13] Second, providers of annuities face a problem common to insurance markets. Known as "adverse selection," this problem arises because individuals may know more about their own survival probabilities than do the companies that insure them. Any given annuity contract looks especially attractive to individuals who have good reason to think that they will live for a long time, receiving benefits well into the future. Likewise, the contract looks particularly unattractive to individuals who have good reason to expect that they will die in relatively short order, after receiving only a few payments. Thus, the purchasers of annuities tend to have longer life expectancies than members of the general population with otherwise similar characteristics. Table 2.5

[13] Competition is consistent with a normal level of profits sufficient to provide the company's investors with the market return on their investments. Anything above that level of profits is termed *supracompetitive*.

documents the large differential in mortality rates for the general population and for those who purchase annuities. Insurers must adjust annuity payments downward to compensate for this problem of adverse selection.

Providers of annuities face a problem common to insurance markets, known as "adverse selection"; insurers must adjust annuity payments downward to compensate

Mitchell et al. (1997) attempt to estimate the magnitude of the costs of adverse selection, as well as other transaction costs and supracompetitive profits earned by the insurer. They accomplish this by calculating the actuarial value of annuity streams using mortality probabilities for the general population as well as for annuity purchasers in particular (such as those reported in Table 2.5). These figures are then compared with the actual purchase prices of annuity contracts. The results of their study can be summarized as follows.

For an average 65-year-old man drawn at random from the general population, the actuarial present value of the payouts from a single-life annuity is about 82 percent of the initial purchase cost. This figure is slightly higher for women and for those who choose the joint-and-survivor option. In addition, it generally declines with the annuitant's age at the time of purchase. In contrast, for an average 65-year-old man drawn at random from the set of people who actually purchase annuities, the actuarial present value of the payouts from a single-life annuity is about 92 percent of the initial purchase cost. Similarly selected women and those who elect the joint-and-survivor option receive slightly lower fractions of their initial investments. For the annuitant population, the value per dollar invested actually increases with the age of the annuitant at the time of purchase.

The cost of adverse selection is readily apparent from a comparison of these figures. For a 65-year-old man, adverse selection costs equal approximately 10 percent of the initial purchase price (the difference between 82 percent and 92 percent), and

transactions costs and profits account for roughly 8 percent (the difference between 92 percent and 100 percent). Transactions costs include account administration, customer service, marketing expenses, and other costs of account acquisition. In general, costs for adverse selection range from about 5 percent of the initial investment for a 55-year-old woman to 13 percent for a 75-year-old man. The transactions costs and profits for the insurance companies range from 7 percent for a 75-year-old man to 12 percent for a 55-year-old couple electing the joint-and-survivor option. The difference in transactions costs may result from the fact that the insurer expects to manage the accounts of older annuitants for shorter periods of time.

Taken together, the studies by Poterba and Wise (1996) and Mitchell et al. (1997) establish that annuities have the potential to increase substantially the economic well-being of many households. Though the costs of providing annuities are sizable (roughly 18 percent of initial investment for the average 65-year-old man and roughly 8 percent of initial investment among men who actually purchase annuities), they are significantly smaller than the economic gains achieved through annuitization (roughly 37 percent of initial investment for a risk-tolerant 65-year-old man).

Through the appropriate use of joint-and-survivor provisions, annuitants can manage cash flows during retirement to ensure income adequacy for their spouses as well as for themselves. Indeed, the proper use of these provisions has proven to be an essential tool for reducing the incidence of poverty among widows. Prior to the passage of the Retirement Equity Act of 1984, as mentioned above, private pension recipients were not generally required to secure written spousal approval to waive two-life options. Myers, Burkhauser, and Holden (1987) found that, among couples in which the husband died prior to 1979, 58 percent of the men were eligible to receive a pension, and only 28 percent of these elected a survivor option. Poverty rates among women doubled from 14 percent to 28 percent upon the death of their husband. These rates were much lower among those with pensions who elected survivor options. According to the authors' calculations, in instances where the husband was covered by a pension but elected a single-life option, a universal survivor benefit would have reduced widows' poverty rates from 16.7 percent to somewhere between 4.4 and 7.9 percent.

As emphasized thus far, some aspects of liquidation management through annuities are attractive for purely economic reasons. The same features of annuity contracts may also be attractive for psychological reasons. As has already been mentioned (and will be discussed at greater length in Section 5), some recent research suggests that problems of self-control may prevent some people from making prudent decisions concerning the trade-off between current and future consumption. Proponents of this view point to recent experience with individuals covered by 401(k) plans. Current statutes permit individuals to withdraw funds from 401(k)s upon termination of their employment with the company sponsoring the plan and to transfer plan balances into an individual retirement account without penalty. In practice, a surprisingly small fraction of the individuals receiving these distributions report rolling over any portion of the proceeds into another retirement account (Poterba, Venti, and Wise 1995).[14] Some of these individuals may have encountered unexpected financial burdens, or they may have taken advantage of an opportunity for penalty-free withdrawal to pay debts or purchase more liquid assets. However, the low frequency of reinvestment into retirement accounts raises the possibility that individuals may tend to overspend from lump-sum distributions received at retirement. Annuities provide a mechanism through which the investor can make a relatively more binding commitment, thereby ensuring an adequate income for the remainder of life.

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[14] In the May 1993 Employee Benefit Supplement to the Current Population Survey, only 14.2 percent of respondents (representing 31.1 percent of account balances) reported rolling any part of lump-sum distributions into IRA or new employer plans; another 7.4 percent (15.8 percent of balances) said they invested part of the proceeds in an IRA; and 2.0 percent (4.6 percent of balances) said that they purchased an annuity or contributed to some other retirement program. Ignoring possible overlap between these categories, this represents 23.6 percent of respondents (51.5 percent of balances). The corresponding figures are somewhat higher for older workers.

In practice, annuity purchasers recognize and attach considerable value to the cash-flow management and insurance features of annuity products. According to the 1997 Gallup poll cited earlier in this section, 73 percent of nonqualified annuity owners said that the guarantee of a steady income for the rest of their lives was "very important" or "somewhat important" in their decision to buy an annuity. In addition, 84 percent of respondents reported that they intended to use their annuity savings to avoid being a financial burden to their children.

If the economic and psychological advantages of annuities are as sizable as the preceding discussion suggests, then why don't more households take advantage of them? Possibly, many households that could benefit significantly from annuities fail to purchase them due to lack of familiarity with or misconceptions about the product. However, even well-informed individuals may, for perfectly sensible reasons, have limited appetites for annuitization. For example, as mentioned previously, individuals who desire to leave bequests are best advised to eliminate all risks associated with uncertainty about the timing of death by dividing their investments between annuities and conventional assets. Results from a recent survey of TIAA annuity recipients suggests that even those familiar with annuities seek to balance these contracts with conventional investments. Specifically, when respondents were asked what they would do with an unexpected $100,000 windfall, only 26.8 percent said they would purchase additional annuities.

In general, individuals will not choose to purchase annuities on commercial markets unless their desired annuity holdings exceed the annuities they acquire through other channels. Therefore, most individuals acquire significant annuity holdings entirely apart from any contracts they might purchase on commercial markets. Most notably, the social security system provides retirement benefits in the form of annuities. Taxpayers make payments to the government while employed, and after retirement they receive regular monthly payments until they die. In these respects, the social security system operates very much like a commercial annuity. There are, however, a number of important differences. First, the social security system provides a net subsidy to some groups and imposes a net tax on others. In contrast to commercial annuities, it creates transfers across generations (generally from younger to older birth

cohorts) and within generations (e.g., toward those with lower incomes). Second, participation in social security is mandatory. This permits the government to overcome the problem of adverse selection that confronts commercial annuity providers. Third, benefits are determined through a discretionary legislative process. They are neither guaranteed nor tied to the performance of specific investments. Fourth, current law explicitly indexes benefits to the rate of inflation,[15] whereas commercial annuities have historically been unindexed. Fifth, social security provides individuals with no meaningful options for structuring payouts—only one particular (and reasonably complex) form of joint life annuity is provided.

The government also provides life annuities through medicare, in the sense that this program guarantees retirees a basic level of health insurance coverage for as long as they live. Medicare is even less like a commercial annuity contract than social security is, in that the annuity "income" is automatically used to "purchase" insurance and the insurance coverage is identical for all individuals irrespective of prior contributions.

Finally, family networks provide an alternative and less formal method of annuitization. To illustrate how this naturally occurs, imagine that children receive bequests when their parents die early but that the children also provide a safety net should the parents outlive their resources. With this simple understanding, children essentially play the role of an insurance company in providing life annuities to parents. These arrangements are, of course, not restricted to parents and children; support networks often involve extended families. Kotlikoff and Spivak (1981) have shown that even relatively small extended families can obtain a sizable fraction of the economic benefits achievable through actuarially fair insurance. Moreover, families may be less susceptible to the problem of adverse selection than are commercial

[15] Current law explicitly indexes social security benefits to the consumer price index (CPI). However, the CPI, as currently calculated, overstates the true rate of inflation (Boskin et al. 1997). See also Boskin and Jorgenson (1997) for a further discussion of the implications of overstating inflation for indexing government programs.

Is it appropriate to include annuities within the set of investment vehicles that provide opportunities for tax deferral ?

markets. In light of these observations, it seems likely that, in recent decades, the declining propensity for elderly parents to live with their children has contributed to the growing demand for annuity products.

Through the combination of social security, medicare, and family networks, many individuals may find themselves more highly annuitized than they would like. Such individuals are not tempted to purchase additional annuity contracts on commercial markets. Bernheim (1991) found that roughly 30 percent of retired couples with children were so overannuitized by social security that they held life insurance to restore bequeathable wealth. Using the same data, Hurd (1987) estimated that 25 to 50 percent of a sample of single individuals would have preferred to trade off social security benefits for bequeathable wealth. Thus, although commercial annuities enable many households to achieve significant increases in standards of living, a sizable minority have little or no desire to supplement annuities acquired through other channels.

A POLICY ISSUE

Though annuities serve important economic functions, the same can be said for many other goods, services, and financial products. The key question is whether, as a matter of public policy, it is appropriate to include annuities within the set of investment vehicles that provide opportunities for tax deferral. Indeed, powerful justifications for this policy arise from the potential role of annuities in addressing the low rate of national saving. The remainder of this paper contains a description of the macroeconomic and personal dimensions of low saving and an explanation of the ways in which annuities can be used to help improve economic performance.

SECTION 3/ THE IMPORTANCE OF SAVING TO THE ECONOMY

The net national saving rate in the United States has fallen from an historic average of more than 9 percent of gross domestic product in the 1960s and 1970s to an average of less than 5 percent in the 1980s and 1990s. As recent experience demonstrates, low saving does not preclude high employment, but it does place the full-employment economy on a much lower growth trajectory. The substantial decline in the saving rate has made financing new investments in plant and equipment considerably more difficult for business enterprises. Investment is an important determinant of economic growth because it boosts productivity and leads to the creation of new, higher-paying jobs, in part by bringing new technology to the workplace.

The substantial decline in the saving rate has made financing new investments in plant and equipment considerably more difficult for business enterprises

Consequently, inadequate rates of saving have depressed economic performance, slowing the growth in the living standards of U.S. households. Continued weak saving poses an even greater threat to future economic prosperity. Substantial incremental saving is required to finance the investments that are necessary to prepare U.S. businesses for new challenges in the 21st century.

QUANTIFYING THE DIMENSIONS OF THE PROBLEM

Statistics on national saving describe the total flow of domestic resources available to finance new investment in reproducible physical capital. In practice, investors use some of their resources to purchase foreign assets, including the securities of foreign governments, and some domestic capital formation is financed with resources from abroad. As a result, net national saving affects not only domestic investment and interest rates but also exchange rates, net foreign investment, and the balance of

payments (all discussed at greater length later in this section). The rate of national saving is therefore an important factor in evaluating economic performance.

Measurement Issues

The U.S. *National Income and Product Accounts* (*NIPA*), published by the Department of Commerce, provide detailed information on various parameters of saving: gross, net, private, personal, corporate, public, and national.

Data on gross saving measure the total flow of resources available to finance some specified class of investments. Part of this simply compensates for the depreciation of existing plant and equipment. Net saving measures real increments to wealth and is equal to the difference between gross saving and depreciation allowances.

For most purposes, to net out depreciation is preferable when measuring saving. The proprietor of a business who fails to maintain or replace deteriorating equipment is in effect reducing the value of the operation in order to obtain higher net cash inflow. The concept of net saving would reveal this fact, but the concept of gross saving would not. The same reasoning applies to an individual investor, a corporation, or a country.

Even so, good reasons exist to examine the data on gross saving. For one thing, depreciation is not directly observable. For the United States, the Commerce Department estimates it through a series of complex calculations. The accuracy of these estimates is open to question. Conceivably, the procedure for calculating depreciation could skew estimates of net saving in particular directions, perhaps producing spurious "trends."

A second consideration is that new capital investments may embody recent technological advances. When old machines break down, they are in some cases replaced by new machines that are more productive to begin with. Official measures of net saving usually do not reflect these productivity gains. Data on gross saving may therefore provide a better measure of the rate at which new technologies are assimilated into the capital stock.

National saving consists of two main components: private saving and public saving. Private saving takes place in the personal and corporate sectors of the economy. Public saving is the sum of budget surpluses (deficits) from federal, state, and local governments. Most economists believe that obtaining a better understanding of the national saving rate is possible by decomposing it into these various pieces. For example, low rates of national saving might be attributed to household behavior (high propensities to consume out of disposable income), corporate behavior (a reluctance to retain earnings), or government behavior (a tendency to run large budget deficits). An examination of these pieces may therefore facilitate the diagnosis of an economic malady.

Nevertheless, some economists contend that this decomposition of national saving rates is meaningless. They point out that all economic assets and liabilities ultimately belong to households. Consequently, saving is saving regardless of where it occurs. If this is correct, then the allocation of national saving among sectors is merely an exercise in accounting and has no significance for behavior or policy.

This argument has been used to dispute the validity of decomposing saving into personal and corporate components. Individuals own corporations. Owners have proprietary rights to corporate earnings; moreover, corporations save on behalf of their owners. The allocation of saving between the personal and corporate sectors also creates artificial distinctions between the treatment of incorporated and unincorporated enterprises. Conceptually, it is difficult to justify the practice of treating profits differently depending upon whether they are retained by an unincorporated partnership or by an otherwise identical corporation.

Some economists have taken this line of argument a step further, applying it to the public-private distinction as well. They point out that the government must repay budget deficits at some point in the future and that future taxes are liabilities from the private sector. By reducing the net wealth of the private sector, the government dissaves on behalf of the taxpayers. Likewise, when the government runs a surplus, it reduces future private-sector liabilities, thereby saving on behalf of taxpayers. To

It is possible to stimulate national saving by modifying policies that discourage saving in the corporate or government sector

put it another way, individuals "own" the government in the sense that they are ultimately accountable for financing its activities.

These issues are of great practical importance. If one accepts the premise that the allocation of saving across sectors is meaningless, then many policies designed to increase public saving, such as steps toward reducing the federal deficit, will have no effect on the national saving: although deficit reduction would increase public saving, private saving would decrease by a corresponding amount, leaving the overall level of national saving unchanged. But the available evidence does suggest that the sectoral composition of saving is extremely important. Changes in corporate or government behavior can in principle help to explain low rates of saving. Likewise, it is possible to stimulate national saving by modifying policies that discourage saving in the corporate or government sector.

Official Commerce Department *NIPA* statistics on saving—whether net or gross, aggregated or disaggregated—have been criticized on a variety of grounds. This is because saving is a surprisingly ambiguous and elusive concept. Most economists would define wealth as control over resources that can be converted into consumption, and saving as the accumulation of wealth. However, two fundamentally different ways are used to measure this accumulation. The first approach is based on flows of resources. For example, *NIPA* defines saving as the difference between income and consumption. The second approach is based on stocks of resources—"savings" is defined as the change in wealth. The relation between these two approaches is straightforward. Wealth changes for only two reasons: either new assets are accumulated (the result of investing an unspent flow of income) or the market revalues existing assets (assets appreciate or decline in value). From the perspective of some economists, *NIPA* figures are deficient because they exclude reevaluations. These economists also suggest that this exclusion could potentially

explain the low conventionally measured rates of saving observed in recent years: rising land prices and a bullish stock market may have provided investors with adequate asset accumulation, thereby reducing the need to channel other current income into saving.[16]

Some economists also contend that arbitrary accounting conventions result in the exclusion or mismeasurement of certain forms of saving. Four specific items have received a great deal of attention: consumer durables, education, research and development, and public expenditures on plant and equipment. The Commerce Department has traditionally treated each of these as current consumption, even though many economists think of them as forms of investment.[17]

Rates of saving in the United States have been low by both historical and international standards

Critics of the official *NIPA* statistics on saving often express preferences for other sources of historical data. One natural alternative is the flow-of-funds data compiled by the Federal Reserve. The Fed also publishes national balance sheets that can be used to infer changes in aggregate wealth. It is also possible, at least in principle, to adjust any given data series on saving to incorporate the various expenditure categories mentioned in the preceding paragraph. Each alternative would yield a different estimate for the overall level of saving. However, analyses of alternative and/or adjusted data series generally reveal the same qualitative patterns that are apparent in the *NIPA* data: for roughly the past decade, rates of saving in the United States have been low by both historical and international standards.

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16 See Boskin (1990) for a comprehensive discussion of the important issues in the measurement and interpretation of saving and wealth.

17 The Commerce Department has recently started to measure nonmilitary government investment separately. Thus, it is now possible to treat public expenditures on infrastructure and equipment as investment rather than as consumption.

Historical U.S. Savings Rates

As illustrated in Figure 3.1, official U.S. government statistics on saving paint a rather grim picture of the most recent two decades. The rate of net national saving expressed as a fraction of GDP averaged 10.7 percent in the 1960s and was slightly above 8 percent in the 1970s. Unfortunately national saving began to decline rapidly in the early 1980s. Despite a recent upturn, the rate of national saving has in every year since 1982 remained below its previous postwar low, plummeting from an average 8.2 percent of GDP in the 1970s to 5.1 percent in the 1980s and just 4.1 percent in the 1990s.

Table 3.1 shows the average net and gross rates of saving for the past four decades. The rate of gross national saving (expressed as a percentage of GDP) fell from an average of 18.9 percent in the 1960s to 15.8 percent in the 1980s. At the same time, depreciation increased by 2.5 percentage points relative to GDP. Both factors combined to depress the rate of net saving, which fell by more than half to just 5.1 percent of GDP. In the early 1990s, the rate of gross saving dropped another 2.3 percentage points to 13.5 percent of GDP. The effect of this development on the net saving rate was partially offset by a 1.3 percentage point decrease in depreciation allowances. Thus, net savings fell an additional 1.0 percentage points, to just 4.1 percent of GDP.

Widespread clamor over large and persistent federal deficits has created the impression that the government's lack of fiscal responsibility has been solely responsible for the low rates of national saving in the 1980s and 1990s. This is an exaggeration. Changing patterns of consumption and investment in the private sector have been equally important. Table 3.2 decomposes the net national saving rate into its private and public components. As noted earlier, the rate of net national saving fell by a staggering 4.1 percentage points between the 1970s and 1990s. Roughly 2.3 percentage points—more than 55 percent of the total change—was attributable to declining rates of private saving (that is, the ratio of private saving to GDP). Of that amount, 1.9 percentage points—more than 40 percent of the total decline in national saving—reflected dwindling rates of personal saving. Even with highly publicized federal deficits, government saving fell by just 1.8 percentage points. This breakdown

attributes less than 45 percent of the total decline in national saving to the public sector. Furthermore, as will be demonstrated shortly, this analysis tends to overstate the role of government deficits in explaining the rapid declines in the national saving rate.

The fact that Americans save less as a percentage of GDP than in previous decades means that our consumption of final goods and services has risen. The rate of public consumption has actually changed little during the last few decades. Instead, private consumption has risen dramatically relative to GDP. This observation does not necessarily absolve lawmakers of responsibility for our current predicament. In particular, federal deficits have allowed the government to keep transfers to the elderly high and taxes low (relative to spending) and have therefore raised disposable income. Naturally, most people tend to spend more when their take-home pay rises. This is especially true for elderly individuals, who are primarily drawing down rather than adding to their savings.

Yet, in practice, public deficits cannot account for most of the observed increase in the private consumption rate. When a household receives an additional dollar of disposable income, it usually spends some and saves some. Consequently, higher levels of disposable income should boost both private consumption and private saving as fractions of GDP. Yet private saving has fallen.

Explaining the simultaneous decline of private saving and rise of private disposable income is very difficult, yet this issue is of paramount importance. Table 3.3 shows the ratio of private disposable income to GDP and the ratio of private saving to private disposable income. As expected, private disposable income has increased substantially from 72.4 percent of GDP in the 1970s to 75.4 percent in the 1990s. Despite these substantial increases, the propensity to save out of disposable income has fallen from over 11 percent in the 1960s and 1970s to just 7.6 percent in the 1990s. The propensity to save out of income has declined so rapidly that the overall private saving rate has fallen from 8.0 to 5.7 percent of GDP (see Table 3.2).

The propensity to save out of income has declined so rapidly that the overall private saving rate has fallen from 8.0 to 5.7 percent of GDP

This decline has had a substantial impact on the national saving rate. If the propensity to save out of income had remained at its average 1970s level of 11.1 percent, through the 1980s, private saving would have actually increased to 8.2 percent of GDP in the 1980s. And, despite the increases in the deficit, national saving would have averaged about 6.8 percent of GDP rather than 5.1 percent. Furthermore, if the propensity to save out of income had continued at its 1970s average through the 1990s, national saving would have averaged 6.8 rather than 4.1 percent of GDP. In contrast, the total elimination of government deficits would not have raised the rate of national saving beyond 5.5 percent in the 1980s or 4.6 percent in the 1990s.[18] Thus, neither the long period of large federal budget deficits nor rising government consumption is primarily responsible for the low rate of national saving. Surprisingly, the behavior of private individuals and business emerges as the principal cause of declining saving.

International Comparisons

Since most countries keep detailed national income accounts, official data are readily available for making international comparisons of saving rates. Unfortunately, accounting conventions differ from country to country, and these differences can in principle render comparisons meaningless. Several international organizations, including the United Nations, the International Monetary Fund (IMF), and the Organization for Economic Cooperation and Development (OECD), collect extensive data on worldwide economic activity and compile national accounts based on standardized accounting conventions. These efforts at standardization are not perfect; some problems of comparability remain.

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[18] This figure is based on the assumption that one dollar of public saving contributes 30 cents to national saving. The available evidence generally supports this assumption and is discussed in detail in Section 5.

The United States saves very little relative to other developed countries

Table 3.4, which is based on OECD data, shows rates of net national saving as percentages of gross national product for the United States, Japan, and OECD Europe.[19] One conclusion is inescapable: the United States saves very little relative to other developed countries.[20] Specifically, European countries belonging to the OECD saved approximately two and a half to three times as much as the United States (relative to output) in both the 1980s and early 1990s, and Japan saved almost six times as much in the 1990s. This is not a recent development: throughout the entire postwar period, the United States has saved a significantly smaller fraction of output than the rest of the developed world.

Thrifty habits have not always been so unfashionable in the United States. Indeed, during a period of roughly 70 years prior to World War II, the United States had an extremely high ratio of gross capital formation to GNP. Among the developed nations, only Canada invested a larger fraction of output during this period, and the United States was a close second. Moreover, although Japan is widely thought of as a frugal nation, this is a relatively recent development. Prior to World War II, the United States invested roughly 50 percent more than Japan as a percentage of GNP (Lipsey and Kravis 1987).

Once more, those who point to federal deficits as the primary cause of low saving in the United States would do well to consider the statistical record in greater detail. A comparison of national saving across countries reveals that patterns of consumption

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19 These countries include Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, Turkey, and the United Kingdom.

20 The U.S. economy's superior economic performance over recent years is not attributable to its low rate of saving. Rather, the country has benefited from a variety of other factors, including a relatively efficient capital market (which puts saving and investment to more productive uses), labor markets that are much more flexible than those of most other countries, and an economic and policy environment that is hospitable to new firms.

and investment in the private sector are again primarily responsible for our low rate of saving. During the last two decades, many developed countries—including Japan—battled enormous budget deficits comparable to those observed in the United States. Nevertheless, U.S. households were much less inclined to save than were their European and Japanese counterparts.

In summary, the official data clearly indicate that the United States saves very little, by both historical and international standards. Moreover, the behavior of the private sector, particularly the household sector, is primarily responsible for the large differentials between the saving rates of the United States and other countries.

MACROECONOMIC CONSEQUENCES OF LOW SAVING

Saving by Americans provides funds for new investments both at home and abroad. Similarly, a portion of foreign saving ultimately finances purchases of new plant and equipment in the United States. Total investment in the United States is therefore equal to domestic saving plus net inflows of capital from abroad. This simple observation implies that lower rates of domestic saving must, of necessity, either depress domestic investment or boost net inflows of foreign capital. The relative importance of these two effects depends upon certain key features of the domestic and global economies.

To understand the link between saving and other macroeconomic aggregates, one needs to think in terms of the supply and demand for financial capital.[21] When an individual saves or when a foreign investor diverts resources to the U.S. market, additional financial capital becomes available. Thus, supply consists of domestic saving plus net inflows of foreign capital. When a business undertakes new investments in plant and equipment, it attempts to raise the necessary funds either internally or externally. Accordingly, the demand for new financial capital reflects the profitable investment opportunities of domestic businesses. As in other markets, the

[21] The term *financial capital* is used to denote the funds that are available for financing the purchase of new plant and equipment (sometimes referred to as *physical* capital).

price of financial capital (that is, the rate of interest) adjusts to bring supply and demand into balance.

A decline in domestic saving at prevailing rates of interest reduces the supply of financial capital relative to demand. When demand exceeds supply, many businesses find themselves unable to raise funds for profitable investment opportunities. Some of these businesses are willing to bid for scarce funds by offering higher rates of return to potential investors. Thus, the price of financial capital, the rate of interest, rises in response to a supply shortage. Higher rates of interest, by providing more generous rewards to those who supply financial capital, tend to stimulate supply. Rising interest rates also increase the cost of financial capital for domestic businesses, thereby reducing the number of potentially profitable investments. These two effects bring supply and demand back into balance at some higher price. If the supply of financial capital is very responsive to interest rates, then a small increase in these rates will restore balance, leaving investment largely unaffected. On the other hand, if supply is relatively unresponsive, then interest rates will have to rise substantially, producing a more pronounced decline of investment.

The supply of financial capital can respond to changes in interest rates through two distinct channels. First, higher rates of return may encourage greater domestic saving. As will be discussed in Section 5, economists disagree about the quantitative importance of this effect. Second, as interest rates rise in the United States, foreign investors divert funds from projects in other countries to more profitable U.S. opportunities. If foreigners are sufficiently responsive to rates of return in the United States, then declining rates of domestic saving should have very little impact on either interest rates or investment. Larger net inflows of foreign capital might then result in greater foreign ownership of U.S. assets.

Unfortunately, economists also disagree about the extent to which higher domestic rates of interest attract greater inflows of foreign capital. According to one school of thought, political, cultural, and legal barriers impede the free flow of financial capital across national borders (see, e.g., Feldstein and Horioka 1980). If this is correct, then domestic saving must be the primary determinant of domestic

Economists also disagree about the extent to which higher domestic rates of interest attract greater inflows of foreign capital

investment. Proponents of this view point out that, for most industrialized countries, differences between domestic saving and domestic investment have rarely been large, except for relatively short periods during which strong political pressures to eliminate imbalances are present.

At one time, significant structural barriers arose to international capital mobility. However, over the last two decades, liberalization programs have largely eliminated these barriers. As a result, financial markets have become increasingly well integrated. The consequences of financial integration are evident: both U.S. investment abroad and foreign investment in the United States have risen sharply. In 1980, foreign investors acquired over $58 billion worth of U.S. assets, and U.S. investors purchased approximately $87 billion in foreign assets. In 1995, foreigners invested more than $426 billion in U.S. assets, and Americans acquired approximately $280 billion of foreign assets. In 1980, U.S. ownership of foreign assets exceeded foreign ownership of U.S. assets by roughly $400 billion. By 1995, foreigners owned over $3.2 trillion of U.S. assets, and Americans owned roughly $2.5 trillion worth of foreign assets.

In theory, the progressive integration of international capital markets could sever the link between domestic saving and investment. If financial capital is always attracted to the highest available rate of return regardless of geographic location, then domestic investment should be determined by the worldwide supply of financial capital rather than by the domestic supply. A decline of domestic saving should then simply increase net inflows of foreign capital, leaving investment largely unaffected.

In practice, a strong link between domestic saving and domestic investment persists despite the liberalization of international capital markets. When U.S. saving declines, foreign investors are indeed attracted by higher rates of return. However, investors

do not and should not regard foreign and domestic ventures as perfect substitutes. As they invest increasing fractions of their portfolios in U.S. assets, foreigners become progressively more reluctant to commit further resources to the U.S. market. To counter these concerns, U.S. businesses must compensate foreign investors by offering higher rates of return. The resulting increase in the cost of financial capital chokes off investment. According to some estimates, if national saving declined permanently by 1 percentage point relative to GDP, then domestic investment would drop by a quarter of a point within one year and by half a point within three years. Net inflows of foreign capital would rise sharply at first but would then decline gradually over time.

At first glance, the historical record appears inconsistent with the theoretical prediction that low saving leads to high rates of interest. In particular, interest rates were roughly comparable in the 1970s and 1980s even though saving fell dramatically as a percentage of GDP. There is, however, a simple explanation.

The increase in real interest rates in the late 1980s and early 1990s relative to the 1970s is substantially attributable to the decline of national saving

Interest rates consist of two components: a real return to capital and compensation for the erosion of the value of principal that occurs with inflation. The first component—the real rate of interest— is equal to the difference between the nominal, or market, interest rate and the expected rate of inflation. The 1970s were characterized by relatively high inflation, and real interest rates averaged close to zero. In contrast, the United States experienced much lower inflation during the late 1980s, and real rates jumped to roughly 4 or 5 percent. To put this in perspective, real rates remained substantially below their recent levels in every one of the last six recoveries. With little doubt, the increase in real interest rates in the late 1980s and early 1990s relative to the 1970s is substantially attributable to the decline of national saving.

The cost of financial capital depends primarily upon the real rate of interest, not the nominal rate. The relationship between these variables is complex and depends in part on features of the corporate and personal tax systems. Several recent studies have calculated cost-of-capital figures for the United States, making appropriate allowances for these factors. This research clearly demonstrates that rising real interest rates have spurred a steep increase in the cost of capital during the 1980s and 1990s.

As financial capital becomes more expensive, investment declines. Table 3.5 contains the Commerce Department's measures of average rates of U.S. domestic investment for the last four decades. In interpreting these statistics, bear in mind that the measurement of investment is every bit as problematic as the measurement of saving. Nevertheless, efforts to address these measurement problems generally do not alter the qualitative patterns that emerge from the official figures. Over the past four decades, gross investment in the United States has declined from a high of 16.5 percent of GDP in the 1970s to just 13.7 percent in the 1990s. During this same period, depreciation allowances have also increased from a low of 8.2 percent in the 1960s to over 10 percent in the 1980s. These changes have led to a precipitous decline in net investment, which has fallen from more than 7 percent of GDP in the 1960s and 1970s to 5.7 percent in the 1980s and just 4.3 percent in the 1990s.

As expected, these changes were somewhat smaller than the observed movements of the national saving rate. Between the 1970s and 1980s, net national saving fell by 3.1 percentage points relative to GDP, but net investment dropped only 1.6 points. Net inflows of foreign investment account for this difference: net foreign investment fell by a whopping 1.8 percentage points relative to GDP. Even so, lower saving depressed the rate of net investment by over 20 percent (1.6 percentage points out of an original 7.3 points relative to GDP). Reversing the trends of the two previous decades, the rate of net inflow of foreign investment actually fell slightly between the 1980s and early 1990s. In combination with a further reduction in the net national saving rate, this produced another decline of 1.4 percentage points in net investment relative to GDP in the 1990s, to just 4.3 percent of GDP.

Although rapid declines in both the gross and net rates of investment suggest Americans are currently investing much less as a percentage of GDP in the 1990s than in the 1960s, this is not necessarily cause for alarm. Over this same period, the price level for investment has been rising at a slower rate than the price level for the economy as a whole. Although still implying that Americans are investing a much lower fraction of available resources, the lower rates of investment relative to GDP noted above may simply reflect the fact that businesses can purchase relatively more capital for the same price than in previous decades.

One way to assess the importance of the difference in the growth of the price levels for investment and for the economy as a whole is to examine the ratio of real investment (investment adjusted to reflect the price level of capital goods) to real GDP (GDP adjusted to reflect the general price level). The rates of both gross real investment and net real investment are shown in Table 3.6. Over the four decades of our study, the rate of gross real investment has remained relatively constant, ranging from 12.9 percent in the 1960s to 14.4 percent in the 1980s. Because of rapidly increasing depreciation allowances, however, the rate of net real investment has fallen from a high of 6.2 percent in the 1970s to 4.4 percent in the 1990s—more than a 30 percent decline. Over the same period, the ratio of nominal investment to nominal GDP fell by more than 40 percent. Thus, some of the decline in the net investment rate is attributable to the fact that the prices of capital goods have been rising more slowly than the general price level.

The rate of gross real investment has remained relatively constant, the rate of net real investment has fallen

Aside from depressing domestic investment and promoting foreign ownership of U.S. assets, inadequate saving also yields deteriorating current account balances. Indeed, these phenomena are two sides of the same coin. As a matter of national income accounting, the current account deficit is necessarily identical to the total net inflow of foreign capital. Since low saving stimulates foreign investment in the United

States, it must therefore also contribute to the deterioration of the current account balance. Mechanically, this occurs as follows: When saving declines, the supply of financial capital falls short of demand, and interest rates start to rise. Higher returns attract foreign investors, who attempt to acquire dollars to purchase assets from U.S. owners. This produces an increase in the relative demand for dollars and drives the real value of the dollar up relative to foreign currencies. Since foreign goods become relatively cheap for U.S. consumers, the demand for imports rises. Likewise, the demand for exports declines as U.S. goods become more expensive for foreign consumers. This imbalance contributes to the trade and current account deficits.

This is precisely the scenario observed during the mid-1980s, when low saving and rapid appreciation of the dollar coincided with rapidly increasing current account deficits and large capital inflows from abroad. The large inflows of foreign capital into the United States have resulted, of course, from a variety of global forces. The higher returns resulting from low rates of domestic saving have contributed to this phenomenon; also playing important roles have been other factors enhancing the relative attractiveness of the United States as a place for investment when compared with the rest of the world.

The current account deficit is closely related to the better-known concept of the trade deficit. In particular, the current account deficit equals the trade deficit plus net outflows of capital income. The popular press has focused national attention on current account and trade imbalances and has frequently interpreted these statistics as barometers for the international competitiveness of U.S. industry. The preceding paragraph suggests that this interpretation is valid only in a very limited sense. A current account deficit arises when domestic saving falls short of domestic investment. This gap does not reflect a deterioration of the potential for our industry to compete at any given exchange rate; it does not measure productivity differentials or the quality of

A current account deficit arises when domestic saving falls short of domestic investment

productive inputs. Rather, it is exclusively attributable to appreciation of the dollar, which makes U.S. goods relatively more expensive. Of course, the shortfall of saving may also depress investment, which would eventually affect the ability of U.S. industry to compete at whatever rate of exchange ultimately prevailed. But that effect is not measured in any way by the current account balance.

To redress trade imbalances without disrupting economic prosperity, the United States must achieve a significantly higher rate of national saving. Admittedly, this will entail tangible costs. Americans must get used to lower rates of consumption and higher prices for foreign goods. However, our standard of living will not suffer permanently. In relatively short order, productivity growth should accelerate as high saving provides the financial capital required for the investment of U.S. industries. In the long run, a larger and more modern capital stock would allow the United States to sustain a permanently stronger dollar and a higher standard of living.

SECTION 4/ THE IMPORTANCE OF SAVING TO INDIVIDUAL HOUSEHOLDS

In addition to providing the foundation for domestic capital accumulation, private saving plays a second vital role. From the standpoint of individuals and families, saving is the method by which the household can reallocate resources over time and across uncertain contingencies. Households often save to finance consumption during retirement or to pay for large, infrequent expenditures such as a down payment on a home or a child's education. Saving is also a type of insurance, as it provides a financial reserve against adverse developments. This "precautionary" saving complements traditional forms of insurance that protect against a variety of contingencies, from illness to temporary labor market dislocations.

The importance of personal saving, and of maintaining an environment that supports a wide variety of market-driven saving and insurance vehicles, will become still more important in the years ahead. Rapid increases in life expectancy and the aging of the baby boom generation will ensure that an unprecedented fraction of the U.S. adult population will soon be out of the labor force and acting as net consumers of resources. This observation raises a fundamental long-run policy question of who will pay for these resources. There are four possibilities. The first is that no one pays—the baby boomers could simply accept much lower standards of living during retirement or continue to work indefinitely. Second, the government could provide generous benefits through social security. Third, employers could accumulate substantial stocks of wealth on behalf of workers through pension plans. Fourth, each household could save aggressively on its own behalf.

Maintaining an environment that supports a wide variety of market-driven saving and insurance vehicles will become still more important in the years ahead

The first possibility is far-fetched. Historically, the elderly have wielded considerable political clout and used it to protect their own

interests. The political power of the elderly can only expand with their ranks. Baby boomers might tolerate marginal increases in the age of retirement, but they will probably resist more-fundamental changes. The second possibility flies in the face of fiscal reality. To maintain existing social security benefits (including medicare), the government would need to impose burdensome taxes on younger generations. Although the working age population is generally less politically active than retirees, huge tax increases would probably have a galvanizing effect, polarizing the political system along generational lines. Of course, these large tax increases could cause many additional problems for the economy. The third possibility is relevant for a declining fraction of workers. With the increasing popularity of participant-controlled defined contribution plans such as 401(k)s and 403(b)s, pensions are becoming less distinguishable from other forms of voluntary personal saving. Finally, the financial behavior of baby boomers to date has been inconsistent with the fourth possibility. Clearly, something must give.

This section analyzes retirement savings in the context of the demographic transition that will occur in the not-too-distant future and examines the growing importance of private retirement savings as the financial demands of retirement increase, particularly in light of projections concerning the adequacy of support from other sources, including social security, pensions, and inheritances. The section also contains an evaluation of the adequacy of retirement saving by the baby boom generation to date.

Over the next few decades, new retirees will probably become increasingly reliant on voluntary personal saving to achieve retirement income security

THE GROWING IMPORTANCE OF PERSONAL RETIREMENT SAVING

Over the next few decades, new retirees will probably become increasingly reliant on voluntary personal saving to achieve retirement income security. This forecast reflects two concerns: first, the financial demands of retirement will rise steadily; second,

households will find meeting these demands through alternatives to personal saving increasingly difficult.

Trends in the Financial Demands of Retirement

What is meant by the phrase "financial demands of retirement"? One possibility is to limit the discussion of financial demands to necessities, such as basic nutrition, shelter, clothing, and medical care. This requires drawing a distinction between purchases that arise from need and purchases that arise from preference. Of course, needs vary in intensity, and they are often difficult to distinguish from desires. Perhaps more important, retirement itself is usually a reflection of preferences. Except in cases where disabilities limit activity, many individuals could continue to work long after they actually retire. Put somewhat differently, it is difficult to make the case that retirement leisure time is usually a necessity.

At the opposite extreme, the financial demands of retirement may be defined to include whatever retirees choose to spend their money on. However, this view quickly leads to the tautology that expenditures are always just sufficient to cover costs. From this perspective, one cannot meaningfully raise, let alone address, issues concerning the adequacy of retirement income provision.

An intermediate possibility—and the one adopted in this study—is to define the financial demands of retirement relative to preretirement expectations. If a healthy woman expects to retire at age 62, to remain in and maintain her existing house, to have good medical care, to eat well both at home and at restaurants, to take yearly vacations, to play golf weekly, and so forth, then these expectations determine her perceived cost of retirement.[22] If, as is commonly assumed in economic analyses of retirement, individuals have perfect foresight, then reality will always match expectations, and this third approach will be equivalent to the second (wherein expenditures always match costs, and the notion of "saving adequacy" is ill-defined). However, if individuals lack perfect foresight, then reality may frustrate (or surpass)

[22] Naturally, for this purpose, one must be careful to distinguish between serious expectations and fantasies, such as winning the lottery and living out one's days in the lap of luxury.

expectations; individuals may experience regret at having saved too little (or too much). In that case, the shortfall between expectations and reality provides a natural benchmark by which to measure the adequacy of retirement income.

The appeal of this final perspective is practical as well as theoretical. The influential political activities of the elderly are shaped not only by objective conditions but also by their subjective perceptions and by the gap between their expectations and the reality of retirement. These political activities will become increasingly influential with the aging of the baby boomers, as the elderly account for a rising fraction of the population.

No indication has surfaced that the trend toward earlier retirement will reverse

One of the most important drivers of retirement costs is the length of the retirement period. Historically, as workers have retired earlier and lived longer, this period has expanded on both ends. As yet, no indication has surfaced that the trend toward earlier retirement will reverse; indeed, a recent Merrill Lynch survey revealed that the typical baby boomer expects to retire at age 62. At the same time, indicators are strong that the baby boomers will live significantly longer than their parents. Even official mortality projections, which envision significant gains in life expectancy, may markedly understate the longevity of those retiring in the next century. According to Vaupel (1992), "If current rates of progress in reducing mortality at advanced ages continue or accelerate, children alive today may live 90 or even 100 years on average."

Longer life reflects better health. However, this does not imply that the costs of medical care will decline. That medical expenses rise sharply during the last few years of life is a well-established fact (Cutler et al. 1990). Increased longevity may simply defer the infirmities that give rise to these hefty expenses. Medical costs may also rise with the development of new technologies and procedures, particularly if these developments prolong the final stages of infirmity. The aging of the baby boom

generation will also have the effect of increasing the per capita demand for medical services, which should place upward pressure on the costs of medical care.

This final point illustrates a more general concern. Elderly individuals tend to consume a systematically different bundle of goods (medical care, houses in Florida, ocean cruises, etc.) than do younger individuals. As the composition of the population shifts toward the elderly, the per capita demand for these services will rise. For goods and services with sufficiently large long-run supply elasticities, the resulting impact on relative prices should be low. However, in instances where resources are inherently limited (e.g., desirable homesites or vacation locations), one would expect relative prices to rise. In effect, just as they set off a sharp rise in housing prices during the 1980s by bidding against each other for homes, the baby boomers will bid against each other for scarce resources that are desirable complements to retirement activities.

Although prices will rise for the goods the elderly consume relatively more of than the rest of the population does, the prices of the goods they consume relatively less of will decline. This decline will partially offset the negative effects of the price increases for the goods in high demand. Such an offsetting price change dampens the effects of the demographic bulge on the budgets of the baby boom generation, but it does not change the fact that the overall impact of these effects is negative.

Improved health also has implications for the nonmedical costs of living during retirement. A long-standing debate has been waged as to whether retirees must spend more or less than younger workers to achieve a similar standard of living.[23] To a large extent, this debate turns on the issue of whether spending is a complement to or substitute for retirement leisure time. The case for complementarity is strongest for

[23] See, for example, Fox (1982) and Boskin and Shoven (1987) for estimates of replacement rates, the ratio of postretirement income to preretirement income, using the Retirement History Survey. In addition to replacement rates based strictly on income, Boskin and Shoven estimate adjusted replacement rates, which make allowances for leisure, health, and the certainty of earnings. These calculations, like those of the adequacy of retirement saving by baby boomers in Bernheim (1993, 1994b, 1995b, 1996a), discussed later in this Section, attempt to compare the well-being of individuals before and after retirement.

healthy retirees, who often seek to fill their leisure time with costly activities (e.g., travel, golf). In contrast, nonmedical expenses may fall for infirm retirees who find themselves less able to enjoy active lifestyles.[24] As the average retiree becomes more healthy, one would expect to observe a greater perceived need for spendable income.

As the average retiree becomes more healthy, one would expect to observe a greater perceived need for spendable income

There is also reason to believe that the elderly form perceptions of needs during retirement with reference to their own accustomed standards of living. That is, they wish to avoid significant declines in their living standards after retirement. To the extent the country experiences rising standards of living generally, therefore, the perceived financial demands of future retirees can be expected to rise commensurately.

Alternatives to Personal Saving

Financial planners commonly compare retirement planning to the construction of a three-legged stool, where the legs represent social security, private pensions, and personal savings. To this stool one might add one final leg: the possibility of receiving inheritances from previous generations. Once the financial demands of retirement (as defined above) have been evaluated, one can assess the need for personal saving by evaluating the size and integrity of the other legs.

Social security and medicare: The aging of the baby boom generation is the cause for considerable concern about the future of social security and medicare. Today the elderly represent about 12 percent of the U.S. population. That figure will rise to 20 percent by the year 2029, when the youngest boomers reach age 65. Today, there are roughly 3.3 workers for each social security beneficiary. Expectations are that by

[24] Naturally, nonmedical expenses may rise for those who need help with household activities because of disabilities.

2030 there will be only 2.1 workers for each social security beneficiary. If the government were to follow its historical practice of financing contemporaneous benefits for retirees on a pay-as-you-go basis, the implied tax increase on younger generations would be enormous.

Current policy strives to shift some of this burden back to the baby boomers by forcing them to contribute to the accumulation of substantial resources in the social security trust fund. However, projected trust fund balances will not be sufficient to cover benefits under current statutes. According to the Social Security Administration (SSA), an increase in payroll taxes—on the order of 2 to 4 percentage points—is required to redress the imbalance in Old Age Survivors and Disability Insurance (OASDI). Alternatively, the imbalance could be redressed with a corresponding decrease in projected benefits, or a combination of lower-than-projected benefits and tax increases. Unfortunately, OASDI is only one part of the problem. Medicare in particular will contribute even more to the fiscal shortfall in the next century. Moreover, these figures presuppose immediate action. If payroll tax increases are delayed, more-drastic action will be required. And since the ultimate fiscal problems are still relatively far off in time, the prospects for rapid action appear minimal. Finally, even the SSA's pessimistic scenarios are based on potentially optimistic assumptions, such as those concerning gains in life expectancy.

Recently, Auerbach and Kotlikoff (1994, 1995) conducted a comprehensive study of the long-run outlook for U.S. fiscal policy and concluded that existing statutes place the country on an unsustainable path. To meet its projected payouts in the next century, the government will need to spend trillions of dollars more than it currently expects to take in.

According to Auerbach and Kotlikoff, restoring fiscal balance requires drastic action, such as a permanent 32 percent increase in income taxes, or a 29 percent decrease in all public retirement benefits (including health benefits), effective immediately. Waiting 15 years before addressing the problem means it would take a permanent 63 percent increase in income taxes or a 49 percent cut in retirement benefits.

Some people doubt that social security benefit cuts will ever become politically feasible, but there is little basis for this confidence

Some people remain confident they will receive projected future social security benefits because they doubt that benefit cuts will ever become politically feasible. There is little basis for this confidence. Congress has already found a number of politically acceptable ways to reduce benefits. For example, during the 1980s, it delayed cost-of-living adjustments, subjected some social security benefits to taxation, and scheduled future increases in the age of normal retirement. If Congress faced up to the necessity of cutting benefits today, then minimizing the impact on those who have the least opportunity to adjust would be possible by scheduling larger benefit reductions for those who will retire in the more distant future (e.g., by raising the age of both normal and early retirement). However, Congress more likely will postpone the inevitable and scramble to find the least politically difficult form of benefit reduction and/or tax increases when the fiscal problems fully materialize. Means testing is one obvious possibility. One can easily imagine that wealth and/or income tests that exclude only the "wealthy" will receive widespread support. However, once instituted, such a provision would likely be used to reduce or eliminate benefits for an increasing number of Americans as the fiscal imbalance worsens.

Even if social security benefits are not cut, the fraction of preretirement household income replaced by social security will probably decline over the next few decades. This is because two-earner households are much more common among the baby boomers than among their parents. Since single-earner households have historically received significant windfalls from social security in the form of spousal benefits, social security replaces a smaller fraction of preretirement earnings for two-earner households.

Private retirement benefits: Unlike social security, eligibility for private pensions is far from universal. Between 1979 and 1993, the percentage of full-time male

private-sector employees participating in a pension plan fell from 55 to 51 percent. The decline was particularly striking for younger workers: only 41 percent of full-time male private-sector employees between the ages of 25 and 29 were covered by private pensions in 1993, compared with 53 percent in 1979 (Papke 1996). To some extent, these trends have been offset by increases in coverage for women.

Many explanations have been offered for falling pension coverage, including declining marginal tax rates (Reagan and Turner 1995), falling unionization (Bloom and Freeman 1992), competitively driven cost-cutting measures, and so forth. Irrespective of the cause, the ultimate consequence will be to reduce the fraction of Americans who can rely on private pensions as a significant source of postretirement income.

The shift from defined benefit to defined contribution pension plans has complex implications for retirement income security

The characteristics of private pensions have also been changing. Between 1985 and 1992, the number of participants in large (more than 100 participants) defined benefit plans fell from 21.6 million to 19.8 million, and the number of participants in large defined contribution plans rose from 27 million to 29.5 million (Papke 1996). More specifically, the share of total pension contributions accounted for by 401(k) plans rose from 18 percent in 1985 to almost 50 percent in 1992 (U.S. Department of Labor 1996).

This shift from defined benefit to defined contribution pension plans has complex implications for retirement income security. On the one hand, defined contribution plans are fully portable, whereas the value of defined benefit pension entitlements is eroded by job mobility. On the other hand, many defined contribution plans, particularly 401(k)s, offer employees a wide range of choices, including how much to contribute, what to invest in, whether to make early withdrawals, and even whether to participate in the first place. Many employees choose to contribute little or nothing at all or to withdraw their balances when they switch jobs. Many invest heavily in

safe, low-return fixed-income funds. As a result, fewer than one-third of pension plan sponsors believe their employees will accumulate adequate plan balances.[25]

To state this final issue somewhat differently, the decline of defined benefit pension plans and the growth of participant-controlled plans such as 401(k)s has blurred the distinction between private pensions and voluntary personal saving. In effect, for many Americans, two legs have navigated the circumference of the retirement income stool and merged into one.

Intergenerational transfers: Although precise numbers are the subject of ongoing debate (see, e.g., Kotlikoff 1988; Modigliani 1988), strong evidence has been found that, in the aggregate, substantial wealth passes between generations through gifts and bequests. Consequently, intergenerational transfers represent yet another possible source of funds to finance living expenses during retirement.

Looking to the future, the importance of intergenerational transfers is tempered by several factors. First, and perhaps most important, bequests are highly concentrated. The typical member of any generation receives next to nothing. There is little reason to believe that future beneficiaries will be any different in this respect, in part for the following reasons. Second, future testators are likely to live much longer than their predecessors. In the process, they may well exhaust all or most of their resources, either through normal living expenses or through large end-of-life expenses, such as nursing home care. Third, in comparison with previous generations, the current generation of elderly individuals holds a larger fraction of its wealth in forms that are not bequeathable. For example, social security cannot be passed on to adult children. According to Auerbach, Kotlikoff, and Weil (1992), this trend has already reduced the flow of aggregate bequests to children and grandchildren by 20 percent. Fourth, since the parents of the baby boomers, by definition, had more children per family than other generations did, their bequests will be divided among a larger number of heirs. Finally, as the life expectancy of the elderly increases, more generations of many families will be alive at the same time than ever before. The financial needs of each

[25] Shultz (1996) references a recently released survey of 520 plan sponsors conducted by Rogers Casey, a pension-consulting firm.

generation will certainly place additional demands on wealth that otherwise would have been bequeathed. Also, the increase in the number of living descendants will spread future bequests even thinner. In short, a small number of baby boomers can probably count on inheritances to bail them out; the rest would be foolish to do so. According to the best available estimates, the typical baby boomer is likely to inherit significantly less than $20,000 (Bernheim 1996b).

THE ADEQUACY OF PERSONAL SAVING

As discussed in Section 3, the private saving rate in the 1990s is at a historically low level. Over the last three decades, private saving has declined from rates of more than 8 percent of gross domestic product in the 1970s to only 4.1 percent in the first half of the 1990s—a more than 50 percent decrease. Coupled with the rising financial demands of retirement and the probable decline in other sources of retirement income, these developments raise considerable concerns about the living standards of future retirees. In this section, the adequacy of personal retirement saving for the baby boom generation is evaluated.

To assess the adequacy of saving relative to expectations, one first needs to investigate the nature of expectations. Economic theory suggests that households attempt to smooth their expenditures over time to achieve a stable standard of living. If this is correct, then preretirement living standards provide the appropriate benchmark for expectations. Survey evidence confirms this: nearly 40 percent of baby boomers say they expect their standard of living during retirement to be the same as before retirement, and virtually identical fractions expect better (31.2 percent) and worse (31.1 percent) standards of living. Even among those with the lowest levels of accumulated wealth, more than 60 percent say that they expect their living standards during retirement to be as high as or higher than before retirement (Bernheim 1995a).

For most individuals, the expectation of maintaining current living standards appears to include the retention of existing owner-occupied houses. One survey by the American Association of Retired Persons (AARP) found that 84 percent of persons 55 and over plan to stay in their homes and never move. Fully 62 percent of baby boomers say they intend to stay in a house of equal or greater value after retirement;

60 percent regard home equity as a source of security, to be used only in the event of a major emergency; 23 percent plan to pass their homes to their children through their estates; and only 14 percent intend to use home equity to finance living expenses in retirement (Bernheim 1995b). The behavior of current retirees is consistent with these statements. The elderly have proven reluctant to draw down the equity in their homes to pay for retirement, except to some extent in advanced age when infirmities become more common (Venti and Wise 1989, 1990; Sheiner and Weil 1992). As discussed earlier, reverse annuity mortgages, which in principle permit households to access their home equity without moving, have not been widely used.

The elderly have proven reluctant to draw down the equity in their homes to pay for retirement

In a series of studies, Bernheim (1993, 1994b, 1995b, 1996a) has examined the adequacy of saving by members of the baby boom generation, under the assumptions that these individuals expect to remain in their existing houses and to smooth their standards of living through retirement. These studies consistently find that baby boomers are saving at 33 to 38 percent of the rate required to cover their expected financial demands during retirement.

Bernheim's analysis is based on a computer simulation model that calculates how much baby boom households with varying characteristics need to save throughout their adult lives to accumulate enough for retirement at age 65. The model accounts for probable economic developments over the course of a lifetime and takes account of social security, private pensions, taxes, interest rates, inflation, economic growth, family composition, and employment prospects. It then compares the model-generated saving prescriptions with actual saving, which is deduced from yearly surveys that typically cover more than 2,000 baby boom households.[26]

[26] The data were collected through telephone interviews. To achieve a high level of compliance and to ensure accuracy, questions on demographics, assets, and economic status were deferred until the end of the survey, following a lengthy series of less personal questions. This permitted interviewers to establish credibility, to place respondents at greater ease, and to

Bernheim's studies ignore a number of the factors (discussed above) that are expected to widen the gap between retirement costs and available resources. For example, they assume that baby boomers will probably live only as long as current retirees, that taxes won't rise in the future, that social security and other retirement benefits won't decline, and that health care costs won't rise. Thus, the savings gap is probably wider than is indicated by Bernheim's base-case calculations. Under more realistic assumptions about the future of social security, Bernheim (1996a) finds that baby boomers are saving at only 22 percent of the rate required to cover the expected financial demands of retirement.

A separate study conducted by Arthur D. Little, Inc. and the WEFA Group reached similar conclusions (Arthur D. Little 1993). For this study, income needed at retirement was defined as 70 percent of the average of an individual's income in the final five years in the labor force. This standard, although somewhat ad hoc, is a common rule of thumb used by financial planners, and it delivers on average a standard of living during retirement that is roughly comparable to that enjoyed before retirement. The Arthur D. Little-WEFA study also considers economic projections, demographic trends, and data on household financial behavior. It concludes that households without pension plans typically will have 20 to 30 percent of what they need to retire and that those with pension plans typically will have 50 to 60 percent of what they need to retire comfortably.

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engage respondents in dialogue prior to posing questions of an invasive nature. As a result, response rates on financial questions were extremely high, and comparisons with data contained in the Survey of Consumer Finances reveal no indication that the key economic variables were either underreported or overreported.

SECTION 5/ PUBLIC POLICIES TO RAISE SAVING

The task of restoring adequate rates of saving in the United States poses a major challenge to the architects of national economic policy. As discussed earlier, the current tax system introduces distortions that favor current consumption at the expense of saving. Thus, the starting point for any policy reform is a system that is currently tilted against saving. Widespread concern over declining investment, inadequate preparation for retirement, and other economic woes has spawned sporadic attempts to stimulate saving through piecemeal policies. Taken as a whole, U.S. policy regarding saving remains uncoordinated, inconsistent, and generally ineffective. As long as the United States lacks a coherent approach for increasing national saving, the prospects for significant sustained improvement are slim.

U.S. policy should not deter either public or private saving. The surest way to increase saving is to bring *and keep* federal deficits under control in a manner that does not decrease private saving. Control of the federal budget deficit will become even more critical in the future, as deficits are expected to increase dramatically with the retirement of the baby boom generation. Also, reductions must be made in an economically meaningful way, one that in order to lower these measures does not simply exploit imperfections in the official accounting methods used to track deficits.

The surest way to increase saving is to bring* and keep *federal deficits under control in a manner that does not decrease private saving

Even if the budget were balanced immediately, the rate of national saving would still fall far short of its historical average. The U.S. government must therefore actively and systematically change policies that hinder private saving and must take other measures to stimulate thrift. The situation requires a national campaign designed to reshape current social norms, combined with substantive, high-profile economic incentives. Annuities can play an important role in this process.

IS A POLICY TO INCREASE SAVING NEEDED?

Large social and personal costs are associated with low rates of national saving. But so are genuine benefits. An individual who chooses to save less accepts a less prosperous future in exchange for a higher current living standard. One might argue that the individual has already weighed the relevant costs and benefits and has concluded that the benefits are more important. One of the fundamental guiding principles of U.S. economic policy is respect for free choice, as expressed through free markets. On the basis of this principle, one might be tempted to reject both the claim that Americans currently save "too little" and the associated call for public policies to increase saving. In evaluating the merits of this principle, however, one caveat is especially important: the current tax system distorts the decision making of individuals in a manner that encourages consumption and debt at the expense of saving. Thus, the starting point for any discussion of policies to increase saving in the United States is a tax system that currently disfavors saving.

When the free-market mechanism fails to work as it should, government intervention may be justified. Certainly, the U.S. government has departed from laissez-faire principles on innumerable occasions. However, decisions to intervene should not be taken lightly. In arguing for a particular course of public action, pointing out that certain private decisions are costly does not suffice. Since resources are scarce, virtually all decisions entail costs. In general, the (rebuttable) presumption must be that individuals understand both costs and benefits better than the government does. Therefore, to justify policies aimed at increasing saving, an explanation of why the usual market mechanism has failed to produce a desirable result is necessary.

Those who favor higher rates of saving have usually adopted one of three positions. The first is that the social benefits from saving exceed the individual benefits. Consequently, decisions based upon comparisons of costs and benefits to individuals will yield rates of saving that are inadequate from the social perspective. One important reason for this is that the government taxes capital income. Taxpayers save to accumulate personal resources. They do not attach much value to the incremental contributions that they make to government revenues, despite the fact that these revenues are socially valuable. Other government policies, such as subsidization of

interest payments, achieve the same end. Another explanation for the divergence of individual and social benefits is that saving may create positive externalities. The term *externality* refers to the impact of one individual's decision on another's well-being. If, for example, an investigator's resources fund research that leads to a new discovery and if he or she is unable to extract the personal gains of every individual who benefits from this discovery, then the social benefits from this activity will exceed the researcher's personal benefits. Likewise, in some instances one individual's investment may indirectly enhance the profitability of another's business enterprise, even though the second individual is not obliged to compensate the first.

A second position often adopted by those who favor higher rates of saving is that individuals do not rationally or systematically weigh costs and benefits. The contrary claim is that saving behavior is governed by rules of thumb and that these rules reflect social and cultural norms. If so, then the government cannot ignore its role as an institution that may foster or perpetuate certain norms. If most individuals fail to consider all costs and benefits associated with profligacy and if the national economy is damaged as a result, then the government may be obliged to actively promote more frugal behavior.

The third and final position is that laissez-faire policies may produce an undesirable distribution of resources across generations. Free markets are supposed to promote efficiency, but efficient resource allocation is not always equitable. If current generations are selfishly impoverishing their successors, perhaps by depleting the capital stock or by bequeathing oppressive levels of external debt, then a call for remedial government action is appropriate.

The historical perspective shows that the principle of laissez-faire has never guided U.S. policy toward saving

All three positions may have some merit. In addition, the historical perspective shows that the principle of laissez-faire has never guided U.S. policy toward saving. Although the causes of low saving are

complex, the government clearly has contributed through an antisaving tax policy, budget deficits (government dissaving), and numerous other policies that encourage consumption and debt at the expense of saving. The current rate of saving is not the result of an efficient free market, and even if it were, it may well not be considered socially optimal. Consequently, ample justification can be found for public policies designed to increase national saving.

POLICIES TO RAISE PUBLIC SAVING

A quick review of *NIPA* statistics raises the possibility that the United States could achieve a satisfactory rate of saving simply by balancing the federal budget, as it is currently (and in many cases inappropriately) measured.[27] During the 1990s, net national saving averaged 3.7 percent of gross domestic product—the private sector saved 5.4 percent of GDP, but the government sector borrowed more than 30 percent of this (1.7 percent of GDP). Federal deficits averaged 3.0 percent of GDP, although the state and local sector consistently operated with a surplus (1.3 percent of GDP). If the federal government had balanced its budget, then the government sector as a whole would have run a surplus equal to 1.3 percent of GDP. Assuming no change in the level of private saving, national saving would have totaled 6.7 percent of GDP (1.3 percent plus 5.4 percent). This figure is only slightly below the rates that prevailed during the 1970s. Many commentators have therefore emphasized the importance of balancing the budget to increase the national saving rate.

Unfortunately, the economic argument here is flawed, since private saving depends, at least to some extent, on public saving. Suppose, for example, that Congress chose to balance the budget by imposing higher taxes. Most taxpayers would find themselves with less disposable income. If taxpayers tend to consume 70 cents out of each additional dollar of disposable income, then private saving would decline by 30 cents for each dollar of tax revenues. Thus, public saving would displace private saving at the rate of 30 cents on the dollar.

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[27] Official measures of government deficits rely on accounting conventions that, in many instances, fail to respect appropriate economic principles. See Boskin (1982) and *Economic Report of the President* (1993, 243–65).

Some policy analysts have argued that public saving actually crowds out private saving, dollar for dollar. If so, then the elimination of federal deficits will have absolutely no impact on the rate of national saving. Therefore, to assess its validity, examining this "crowding out" argument (also known as "Ricardian equivalence") in some detail is important.

Proponents of Ricardian equivalence begin with the premise that the public must ultimately bear the burden of paying for federal programs, regardless of whether Congress raises taxes or authorizes additional borrowing. Deficits can postpone the day of reckoning but cannot alter the ultimate price tag associated with any program. Consequently, government borrowing does not make taxpayers any wealthier, despite the fact that it may increase their after-tax incomes. As long as taxpayers understand and believe this argument, it would be foolish for them to consume more today simply because the government has borrowed on their behalf. Instead, they should save their tax rebates and use principal and interest to pay off higher taxes when the debt matures.

This reasoning suggests that the government cannot alter private consumption by substituting taxes for deficits. Public consumption likewise will not change. Since aggregate demand is unaffected, GDP should remain fixed as well. But national saving equals the difference between GDP and total consumption. Since national saving holds steady, proponents of the Ricardian doctrine conclude that, as a matter of economic logic, public saving must crowd out private saving, dollar for dollar.

The argument for Ricardian equivalence is simple, elegant, and almost certainly mistaken. The Ricardian hypothesis is predicated on at least three highly implausible assumptions.[28] First, individual taxpayers must be extraordinarily rational and farsighted. No allowance is made for the psychological impact of postponing or accelerating tax payments. Second, credit markets must work extremely well to offset the effects of tax changes on spending patterns. When the current income of any particular taxpayer is unusually low, he or she may wish to borrow to finance consumption. If this taxpayer is unable to obtain credit at favorable terms, then

[28] See Buiter and Tobin (1987) or Bernheim (1987b) for more details.

disposable income will constrain expenditures. The available evidence indicates that as much as 20 percent of the taxpaying population may fall into this category. These individuals will almost certainly spend less in response to a tax increase. Third, the government must repay deficits in relatively short order. Even though the public ultimately bears the full cost for any federal program, deficits can shift this burden to later generations, in which case current taxpayers might justifiably feel wealthier. Of course, those individuals who care enough about their children may realize that the postponement of taxes does not benefit the family. If the vast majority of individuals come to this realization, then Ricardian equivalence will continue to hold (Barro 1974). However, theory and evidence both suggest that economic ties within families generally do not operate in a way that would rescue the Ricardian doctrine (Bernheim and Bagwell 1988).

The accumulated research strongly supports the view that private consumption responds to changes in public saving.[29] Even if the strict Ricardian hypothesis is false, it does not follow that additional public saving raises national saving dollar for dollar either. The actual effect probably lies in the neighborhood of 30 to 50 cents on the dollar, and few if any economists would argue that it exceeds 70 cents (Bernheim 1987b). Suppose that, instead of running deficits averaging 3.0 percent of GDP, the federal government had balanced its budget during the early 1990s and that states and localities had nevertheless continued to run surpluses. Assuming that each dollar of public saving contributes 30 cents to national saving, the rate of national saving would have increased only .9 percentage points, to 4.6 percent (from 3.7 percent)—a far cry from the 6.7 percent figure (based on the assumption of no crowding out) mentioned at the outset of this section. Even if public saving contributed to national saving at the rate of 50 cents on the dollar, federal budget surpluses would have had to average 8.4 percent of GDP to achieve a 9.4 percent average rate of national saving in the 1960s and 1970s.

Put in perspective, the federal government could not have realized this objective even if it had eliminated all spending on goods and services. This does not mean that

[29] As noted by Boskin and Kotlikoff (1985), the Ricardian equivalence implies that saving should be invariant to the age distribution of resources; they test and reject this prediction.

Congress ought to abandon efforts to exercise fiscal restraint; lawmakers must demonstrate their commitment to national saving by continuing to pursue a balanced budget. But balanced budgets are insufficient by themselves to raise capital accumulation to adequate levels.

Raising the level of public saving has no point if private saving and capital formation are sacrificed in the process

Unfortunately, the pursuit of a balanced federal budget could also produce some undesirable side effects. Congress might attempt to reduce deficits by raising additional revenue through capital income taxes. Many politicians see the tax deferral provisions for life insurance, employee benefits, and retirement accounts (including pensions and annuities) as tax loopholes. By eliminating these vulnerable provisions and by shifting a still larger fraction of the tax burden to corporations, Congress could make progress toward balancing the budget. But this would defeat deficit reduction's primary purpose of raising the national saving rate. Raising the level of public saving has no point if private saving and capital formation are sacrificed in the process. The United States requires a coordinated national saving initiative, not one that is self-defeating.

POLICIES TO RAISE PRIVATE SAVING

Economists have few explanations for the steep decline in private saving that occurred during the 1980s and even less evidence concerning the validity of these explanations. Were the causes of this decline better understood, theorists perhaps would be better positioned to develop effective policy responses. As things stand, they must rely on general evidence concerning the determinants of saving, as well as on historical experience with specific policy alternatives.

General evidence on saving behavior provides some important insights concerning the likely effectiveness of various policy options. This section therefore begins with an extended discussion of the factors that influence personal financial choices and continues on to elucidate implications for public policy. The discussion leads to a

separation of policy alternatives into three large classes: broad-based saving incentives (e.g., those embodied in consumption tax proposals), narrowly focused saving incentives (e.g., IRAs and tax-deferred annuities), and incentives that promote prosavings institutions (such as the employer-based pension system). The natural conclusion is that annuities should play an important role in an overall policy agenda to increase private saving.

Annuities should play an important role in an overall policy agenda to increase private saving

Two Perspectives on Saving Incentives

Broadly speaking, two competing schools of thought exist concerning the determinants of private saving. The predominant paradigm emphasizes economic and demographic factors. It portrays saving as the mechanism through which individuals rationally allocate their resources between current and future consumption. The other paradigm emphasizes the role of psychology. It stresses limitations on rationality and problems of self-control, and it characterizes economic and demographic factors as secondary to social, cultural, and experiential influences. Of course, both sets of forces may be at work, either because both affect many savers or because some households are heavily influenced by one and others are strongly influenced by the other. Thus, both paradigms should be considered in any analysis of saving behavior and the potential efficacy of policies designed to increase saving. In this sense, the two schools of thought are complementary.

Traditional economic perspectives on saving incentives: The most widely accepted economic theory of saving is known as the "life-cycle hypothesis." Its central tenet is that individuals formulate long-range financial plans, rationally balancing future needs against current desires. According to this theory, individuals are particularly sensitive to three concerns that motivate financial planning. First, they expect to retire. If workers fail to accumulate significant resources over the course of their working lives, then they cannot hope to maintain their accustomed standards of living during retirement. Generally speaking, the theory implies that most

individuals should do the bulk of their saving for retirement during the midlife years, when earned income approaches its peak. Second, their incomes are likely to fluctuate. If individuals wish to maintain reasonably stable living standards, then they must accumulate resources to provide a buffer for the lean years. Third, expenditures may also fluctuate. From time to time, most individuals find themselves burdened with large, temporary financial obligations. Some of these expenses, such as paying for a child's college education, are predictable. Other obligations, such as those arising from medical treatment for severe illnesses, may pop up unexpectedly. Individuals must either plan ahead for these expenses by accumulating resources or run the risk of being unable to meet their financial obligations.

The life-cycle hypothesis implies that, in large part, rates of saving should reflect the interplay of various demographic factors. One of the most important should be the age structure of the population. Large concentrations of either young or retired individuals should depress national saving. Conversely, rates of saving should be high in countries with sizable populations of middle-aged individuals. Other important demographic factors include life expectancy and retirement patterns, which together determine the length of the retirement period. According to theory, workers should save more when they plan to be retired for a greater length of time. Therefore, both longer life expectancies and shorter working lives should give rise to higher rates of saving.

Together, rates of return and capital income taxes determine the rate at which individuals can trade off current consumption for future consumption

The life-cycle hypothesis also implies that national saving should depend on a number of economic factors, including rates of return, capital income taxes, net worth, and productivity growth. Together, rates of return and capital income taxes determine the rate at which individuals can trade off current consumption for future consumption. In essence, after-tax rates of return define the economic benefits of saving. All else equal, individuals with greater net worth have less

reason to save additional resources. Among other things, this implies that rates of saving may decline when investors reap large, unanticipated capital gains. When the rate of productivity growth is high, economic resources tend to become more concentrated in the hands of younger workers (who can generally adapt better to new technologies and who will reap the benefits of growth over a longer time horizon), and most workers come to expect larger increases in real wages. Depending upon the specific characteristics of the economy, this could either increase or decrease total saving.

Of the factors assumed to determine saving within the framework of the life-cycle hypothesis, relatively few are amenable to manipulation through public policy. The most notable exception is the after-tax rate of return, which depends on capital income taxes. Unfortunately, as a matter of theory, whether saving should be sensitive to generic changes in the after-tax rate of return, and consequently to tax policy, is not clear. An easy way to see this is to think of the trade-off between present and future consumption. An increase in the after-tax rate of return essentially makes future consumption cheaper. This increase has two opposing effects on an individual's saving behavior. On the one hand, to take advantage of cheaper consumption in the future, an individual may want to spend less on consumption today and save more. On the other hand, the higher interest rate necessitates less initial saving to finance the same or a higher level of future consumption. These opposing effects imply that size of the "interest elasticity of saving" (a measure of saving's sensitivity to the after-tax rate of return) is theoretically indeterminate and fundamentally an empirical issue.

Increases in the after-tax rate of return can substantially impact an individual's welfare, even if his or her interest elasticity of saving is small or zero. To see this, imagine an individual who saves 10 percent of income regardless of the after-tax interest rate, (i.e., has a zero interest elasticity of saving). Although not affecting behavior, a significant increase in the after-tax rate of return will increase future consumption substantially, certainly making the individual much better off.

Economic theories of saving do not usually emphasize the roles of institutions. Nevertheless, they do suggest that some institutional arrangements are potentially important. If, for example, the structure of capital markets makes borrowing difficult for consumers, then net saving should be higher. Institutions that facilitate borrowing may thereby depress rates of saving. Likewise, social insurance programs such as social security, medicare, and unemployment insurance may reduce the risks that motivate precautionary saving.

Some economists have become increasingly concerned that the life-cycle hypothesis does not provide an adequate framework for understanding the psychology of saving

Behavioral perspectives on saving incentives: In recent years, some economists have become increasingly concerned that the life-cycle hypothesis does not provide an adequate framework for understanding the psychology of saving. Even a casual reading of the relevant economic literature suggests that, to determine the solution of a standard life-cycle planning problem, an individual would require a tremendous amount of sophistication and information. Yet much of the population may be ill-equipped to make even the most basic economic calculations (Bernheim 1994c). In addition, a large body of psychological research suggests that imperfect self-control may lie at the heart of many intertemporal decision-making problems (e.g., Shefrin and Thaler 1988).

Behavioral approaches to saving have been pioneered only recently, and the field is still unsettled. Though provocative, much of this work remains speculative. To date, no single analytic framework has emerged as a serious competitor to the life-cycle hypothesis. Nevertheless, the behavioral literature contains a number of potentially useful qualitative principles about saving. Those subscribing to the behavioral school believe that these principles shed considerable light on the likely effects of alternative policies to increase saving.

The first principle is that public policy may alter the ways individuals perceive the costs and benefits of saving. The very existence of a policy aimed at increasing saving may indicate that "authorities" perceive the need for greater thrift. Likewise, individuals may attach significance to contribution limits (expressed either as fixed amounts or as fractions of compensation) on the grounds that these limits reflect the judgment of experts. According to Engen, Gale, and Scholz (1994), among those who could have contributed more than $2,000 to an IRA but contributed less than the limit, 47 percent contributed exactly $2,000. This finding invites the interpretation that the well-publicized $2,000 figure created a focal target for saving and that the very existence of this target may have influenced the behavior of many savers.

The behavioral literature contains a number of potentially useful qualitative principles about saving

According to the behavioral view, saving incentives may also increase the likelihood that individuals learn the extent to which their coworkers and social contacts value the long-term benefits of saving. For example, when a company provides a 401(k), this may stimulate conversations about contributions and investments, leading individuals to be influenced by peer-group effects. Likewise, tax incentives may stimulate promotional and educational activities that underscore the long-term benefits of saving; these effects are discussed below under "Institutional Incentives."

Policies designed to increase saving may also enhance the perceived short-term benefits of saving. Scitovsky (1976) raised the possibility that some individuals may view saving as a virtuous activity in and of itself without any explicit contemplation of future consequences (see also Katona 1974). Popular maxims such as Benjamin Franklin's "A penny saved is a penny earned" reflect this point. The existence of saving incentives may reinforce the notion that saving, as something worthy of encouragement, is an intrinsically desirable activity.

Under certain circumstances, contributions to tax-deferred accounts may also instill

the perception that saving yields more concrete short-run benefits. By making tax-deductible contributions to a tax-deferred account (when permitted), an individual can reduce the amount of taxes owed in the current year or increase the size of his or her refund. Feenberg and Skinner (1989) have argued that the prospect of writing a larger check to the bank and a smaller check to the IRS may be particularly appealing on psychological grounds, since it provides a form of instant gratification. In support of this view, they note that individuals are much more likely to make deductible contributions to tax-deferred savings accounts if they owe the IRS money at the end of the tax year. If this view is correct, then "front-loaded" retirement savings plans (wherein contributions are deductible but all withdrawals are taxed) may stimulate saving more effectively than otherwise equivalent "back-loaded" plans (wherein contributions are not deductible and withdrawals are not taxed).

Individuals are much more likely to make deductible contributions to tax-deferred savings accounts if they owe the IRS money at the end of the tax year

Second, behavioral economists sometimes argue that certain kinds of policies may assist households in overcoming problems of self-control. By segmenting retirement saving from other forms of saving, tax-favored accounts make monitoring progress toward long-term objectives easier. Information on total accumulated balances is usually provided automatically or is readily available. Thus, individuals have a convenient yardstick for measuring the adequacy or inadequacy of their thrift. For those who save little, this may have the effect of making the costs of short-sightedness more explicit. According to Thaler and Shefrin (1981), "[S]imply keeping track seems to act as a tax on any (deviant) behavior."

The literature on self-control also emphasizes the use of "private rules." Hoch and Lowenstein (1991) argue that individuals overcome impulsive inclinations by attaching global significance to small transgressions of these rules. For example,

individuals may stake some aspect of personal self-worth on the ability to follow a self-imposed rule; the benefits of breaking the rule in any isolated instance are counterbalanced by the loss of self-esteem. Similarly, they may construe transgressions of a rule as evidence that they will never be able to follow similar rules; short-term gains from deviation are weighed against losses associated with all related failures of self-discipline, now and in the future.

Saving incentives may provide a natural context for developing private rules concerning the level of saving. Possible rules could include always "maxing out" on tax-favored contributions or always contributing some smaller amount to tax-favored plans. Certain plans, such as 401(k)s, actually provide participants with limited ability to commit themselves to these rules for short periods of time. Saving incentives may also help individuals develop private rules regarding the allowable uses of funds they have previously placed in tax-favored accounts. For example, they might promise themselves they will not withdraw these funds for any purpose short of a dire emergency. This phenomenon relates to the notion of "mental accounting" discussed by Shefrin and Thaler (1988). The existence of penalties for early withdrawal may help the individual establish and enforce barriers around tax-favored accounts by making it costly to get at these savings. On the other hand, by making saving within tax-deferred accounts less liquid than other saving vehicles, early withdrawal penalties may also deter some individuals with precautionary saving motives from fully utilizing these accounts.

Third, according to the behavioral view, nonneutralities in the tax system may stimulate activities by "third parties"—that is, parties (e.g., employers or vendors of tax-favored investment products) other than the individuals who benefit directly from the tax provisions—and these activities may in turn affect the level of personal saving through psychological channels.

The most obvious example of this phenomenon is the private pension system. The tax benefits accorded pensions probably account, at least in part, for their popularity. When an employer offers a traditional defined benefit or defined contribution pension plan, saving automatically increases unless the individual takes steps to negate this

effect. Pure life-cycle decision makers would pierce the "pension veil" and treat the accrued value of pension benefits as a close substitute for other long-term saving. Even so, mandatory pensions may increase the saving of some households by forcing them to undertake more long-term saving than they would otherwise choose. Contributions to pension plans may also represent incremental private saving under various alternative behavioral hypotheses: households may pierce the pension veil imperfectly, they may track pension accruals in different "mental accounts" than they do other long-term saving, or the mere presence of a pension plan may make them more aware of retirement issues.

Selective saving incentives may also have subtle effects on the features of pension plans. For example, 401(k) plans have historically benefited from tax deferral only if they satisfied nondiscrimination requirements regarding the relative levels of benefits provided to highly compensated and nonhighly compensated employees. Rather than risk losing tax-favored status, many firms have taken steps to increase the participation and contributions of nonhighly compensated employees and/or to decrease the contributions of highly compensated employees (Garrett 1995). These steps have often included provisions whereby firms matched employee contributions and adopted retirement education programs. These kinds of plan features have the potential to affect overall saving by eligible workers. Education may be particularly effective when low saving results from a failure to appreciate financial vulnerabilities (see Bernheim and Garrett 1996; Bayer, Bernheim, and Scholz 1996).

Rather than risk losing tax-favored status, many firms have taken steps to increase the participation and contributions of nonhighly compensated employees

Selective incentives may also encourage the vendors of tax-deferred saving vehicles to advertise and promote their products actively. These promotional efforts may serve an educational function or simply focus public attention on retirement income

security. In this way, the promotional behavior of vendors can reinforce the strong economic incentives of tax-deferred savings vehicles. Experience with IRAs during the 1980s suggests that promotion may play an important role in shaping financial choices. IRAs were not established in 1982—they were merely extended to individuals covered by employee pension plans.[30] Similarly, IRAs were not withdrawn in 1986, but households with incomes over certain modest thresholds were no longer able to make contributions with before-tax dollars.[31] In light of these observations, some analysts believe that the changes in IRA contributions after 1981 and 1986 were out of proportion to the changes in pure economic incentives. Only 1 percent of taxpayers made contributions to IRAs prior to 1982, despite the fact that roughly half were eligible. After 1982, participation rose sharply, peaking at 15 percent in 1986. This figure plummeted to 7 percent in 1987 and reached 4 percent by 1990.[32] Notably, the expansion of eligibility for IRAs to all taxpayers in 1981 was accompanied by a great deal of advertising and media fanfare, and this activity contracted abruptly in 1987. Thus, the success of IRAs is probably attributable to the combination of strong economic incentives and promotional activities designed to inform, educate, and excite potential investors.

Probably the most important debate concerns the choice between fundamental changes and narrowly focused strategies for increasing saving

Fundamental versus Narrowly Focused Policies

The preceding discussion emphasizes that the economic and behavioral perspectives on saving may lead to very different prescriptions for public policy. Probably the most important debate concerns the choice between fundamental changes (e.g., the replacement of the current tax system with a consumption tax) and narrowly focused

30 The IRA contribution limit was also increased from $1,500 to $2,000.

31 Even for these individuals, the advantages of tax deferral remain. Notably, deferral rather than up-front deductibility accounts for most of the benefits offered by an IRA.

32 See Engen et al. (1994) for a more detailed discussion.

strategies (e.g., an expansion of individual retirement accounts) for increasing saving. Economists' widespread support for consumption taxation is almost certainly attributable to the influence of the life-cycle hypothesis as the preeminent conceptual framework. Consumption taxation raises the marginal after-tax rate of return to saving and eliminates the "tax wedge" between the pretax return to investment and the after-tax return on saving. In this way, a consumption tax would remove the intertemporal distortions in consumption decisions caused by the current tax system. In addition, a consumption tax would remove the atemporal investment distortions that result because the current tax system favors some forms of investment over others, due, for example, to discrepancies between depreciation allowances and actual economic depreciation.

The effectiveness of fundamental changes depends critically on the extent to which saving is sensitive to the generic after-tax rate of return

Many behavioral considerations suggest that, on the contrary, narrowly focused tax incentives could be more effective than fundamental changes. According to the behavioral view, narrow measures focus attention on the key issue, expose individuals to information concerning the importance of saving, provide a natural context for the development and enforcement of private rules, and promote the growth of prosaving institutions. This same perspective suggests that a consumption tax could undermine the narrow focus on specific objectives that may be essential for the exercise of self-control. It would remove one of the primary reasons for compensating workers through pension plans, and it would eliminate the special feature of particular financial instruments (such as IRAs and annuities) that make them especially marketable. It would also eliminate quirky aspects of the tax system that subtly promote activities such as employee retirement education.

Based on these considerations, some economists support fundamental policy changes to increase saving and remove the distortions of the current tax system, and others believe that the greatest potential for altering behavior lies in narrow policies that

target incentives for retirement saving directly, as well as in policies that encourage the development of supportive institutions. The effectiveness of fundamental changes depends critically on the extent to which saving is sensitive to the generic after-tax rate of return. Until the mid-1970s, most economists believed that saving was largely independent of rates of return (i.e., they thought that the interest elasticity of saving was close to zero). Several scholars (e.g., Boskin 1978; Summers 1981) have since challenged the accepted wisdom on both theoretical and empirical grounds. This challenge has provoked an active debate and has stimulated much additional research using aggregate time-series data. Recent findings generally point toward the conclusion that the generic after-tax return has little influence on the overall rate of saving. Unfortunately, no clear consensus has formed, in part because of measurement problems, and the issue remains open.

Economists have had the opportunity to study narrowly focused tax incentives for saving in the context of individual retirement accounts (IRAs) and employer-sponsored, tax-deferred salary reduction plans, such as 401(k)s. Unfortunately, the literature on the relation between IRAs and personal saving is, on the whole, inconclusive. Studies that point to a large effect on personal saving contain identifiable biases that overstate this effect, and studies that find little or no impact contain identifiable biases that understate the effect (Bernheim 1997). Because of the nature of the IRA program and the characteristics of the available data, a resolution of the IRA controversy seems unlikely.

The apparent success of 401(k)s can be attributed to any of a number of distinguishing characteristics

In the context of 401(k)s, the accurate measurement of saving effects is facilitated by the fact that, in contrast to IRAs, 401(k) eligibility varies considerably across the population and some of this variation probably originates from factors unrelated to the workers' attitudes toward saving. Although no existing study corresponds to the ideal statistical experiment, reasonable procedures point to a substantial behavioral response despite factors that bias the findings in the opposite direction. This

evidence, although controversial, is reasonably persuasive and contributes toward the view that eligibility for a 401(k) plan significantly stimulates personal saving.[33]

With few exceptions, U.S. tax policy is not currently designed to encourage saving

The apparent success of 401(k)s can be attributed to a substantial interest elasticity of saving (and indeed may constitute the best evidence that this elasticity is large) or to any of a number of distinguishing characteristics that complement the higher after-tax rate of return. Since 401(k) contribution limits are rather high relative to the savings of the typical household, they bind for only a relatively small fraction of participants (in contrast to IRAs). As a result, 401(k)s can increase the marginal after-tax rate of return for a much larger set of households. This effect is often reinforced through provisions whereby employers match employee contributions. In contrast, a behaviorist might argue that these pure economic incentives are secondary and that the observed effects arise because the structure of a 401(k) plan capitalizes effectively on the psychology of saving. Since contributions occur through regular payroll deductions rather than through discretionary deposits, 401(k)s may be more conducive to the exercise of self-discipline. High contribution limits may also provide authoritative validation for higher saving targets. Since 401(k)s are organized around the workplace, they may also create positive spillovers between employees (e.g., through informal conversations). Finally, the existence of 401(k)s has promoted the growth of retirement education in the workplace (Bernheim and Garrett 1996; Bayer et al. 1996).

[33] This assumes that the 401(k) is truly incremental and does not replace an existing pension plan.

The Role of Annuities

With few exceptions, U.S. tax policy is not currently designed to encourage saving. The tax treatment of annuities is an important exception to this principle. Tax deferral within annuity contracts encourages saving by increasing the real economic rewards associated with this activity. Also, nonqualified annuities have no contribution limits, implying that, unlike IRAs, these vehicles always provide economic incentives for the marginal dollar of saving. Nonqualified annuities are, in this sense, more like 401(k)s, for which contribution limits are relatively high and typically do not bind. The absence of contribution limits is especially important in the common situation where a household finds itself approaching retirement with relatively little accumulated wealth and it needs to build up a substantial nest egg over a relatively short period of time.

Provisions for tax-deferred annuities also create incentives for the development of prosaving institutions. In marketing annuities, insurance companies and other financial institutions serve an educational function similar to that performed by financial intermediaries in the heyday of IRAs. As a general matter, the advantages and availability of annuities have contributed to the growth of the private pension system. Pensions, in turn, account for a very high fraction of national saving. Between 1980 and 1990, the real growth of pension assets actually exceeded the real growth of national wealth (Shoven 1991).

Fundamental tax reform proposals to increase saving are unlikely to become law in the near term

In light of the growing need to encourage saving, for policymakers to consider extending tax-deferred treatment to a wider range of financial instruments would make sense. Proposals to tax inside buildup within annuity accounts would move public policy in exactly the wrong direction.

Although debate will take place, fundamental tax reform proposals to increase saving, such as replacing the current system of income taxation with a consumption tax, are

unlikely to become law in the near term. At least for some time to come, our tax system will no doubt remain a hybrid between an income tax and a consumption tax. Within a hybrid system, one necessarily treats some forms of capital income differently from others. This, of course, raises an important policy question: Which forms of capital income should be taxed relatively heavily, and which forms should be taxed relatively lightly? Within a hybrid system, why in particular should opportunities for tax deferral be provided through annuities rather than through other investment vehicles?

One sensible criterion is to provide economic incentives—or remove disincentives—in contexts where they are most likely to do the greatest economic good. These incentives are most likely to benefit the economy by stimulating saving when they are packaged with other complementary features that reinforce the desired behavioral response. Tax-deferred annuities present the potential investor with a package of incentives that are particularly powerful from *both* the economic and behavioral perspectives. Although many of the important features of annuities were touched on in Section 2, it is useful to review and expand upon them in the context of public policy.

First, annuities offer individuals opportunities to insure against uncertainty concerning length of life. An annuity recipient need not worry about outliving his or her resources. The introduction of indexed bonds may eventually lead insurers to offer indexed annuities, which will further enhance the usefulness of these contracts by permitting households to protect themselves better against inflation-induced erosion of their living standards.

Second, annuities make dealing with the complexities of long-term financial planning easier for most people. An individual with low to moderate financial sophistication is ill-equipped to determine the rate at which a fixed amount of wealth should be amortized over the retirement period, particularly in the presence of uncertainty concerning the time of death and rates of return. By reducing the complexity of the decision problem, annuities help individuals make better decisions both before and after retirement. Annuities make figuring out an appropriate level of saving far easier;

Annuity contracts are often structured in ways that may help many individuals exercise self-control

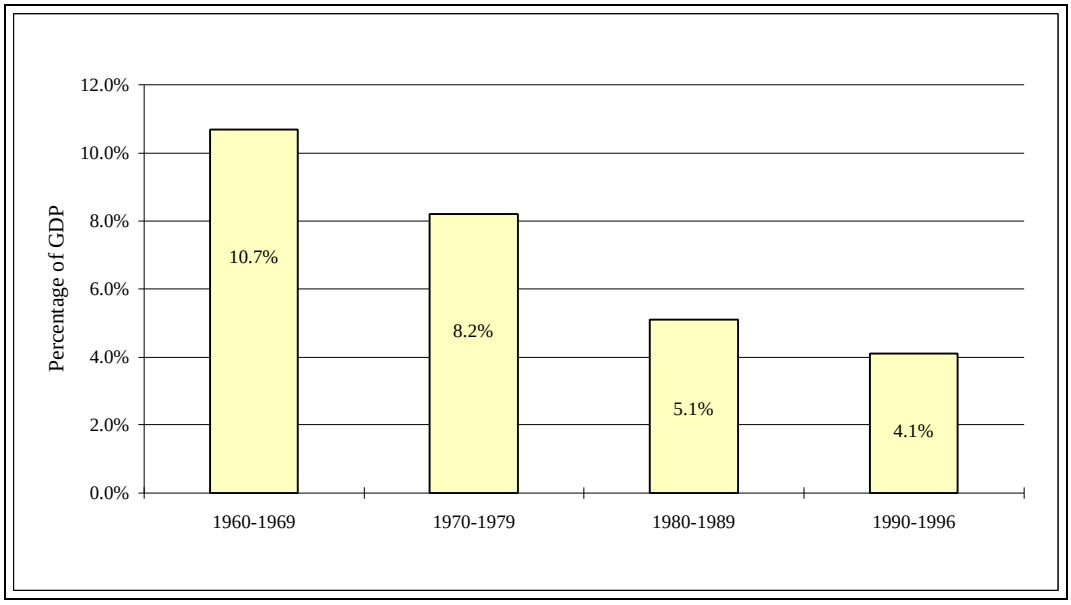
the returns from a dollar of saving can be expressed directly in terms of monthly income, which most people automatically relate to a living standard. Uncertainty concerning length of life is insured against and thereby removed from the picture, and amortization of wealth over the retirement period is performed automatically. Thus, once retirement is reached, an individual has less risk of unknowingly overspending his or her resources.

Third, annuity contracts are often structured in ways that may help many individuals exercise self-control. As mentioned in Section 2, survey results indicate that many individuals view annuities as particularly easy vehicles for building long-term savings. Annuities are frequently financed through regular premiums, and annuitants often can make contributions to both qualified and nonqualified plans (such as supplemental retirement accounts, or SRAs) through automatic periodic payroll deductions. Annuities segregate long-term saving into distinct accounts that are typically earmarked for retirement. The general reluctance to invade these dedicated accounts for other purposes is often reinforced by the existence of penalties for early withdrawals. Likewise, liquidation options facilitate the exercise of self-control after retirement by helping the annuitant manage cash flows. Indeed, in the absence of cash-flow constraints, most households start out after retirement by consuming too much relative to their resources and are compelled to reduce their standards of living within a few years (Hamermesh 1984).

Fourth, annuities provide an appealing framework for evaluating the benefits of saving. Because they offer a range of options for income management during the liquidation phase, annuities encourage individuals to think in terms of achieving retirement income security. From the behavioral perspective, this tangible objective may be more compelling—and therefore more likely to motivate action—than an abstract net-worth target.

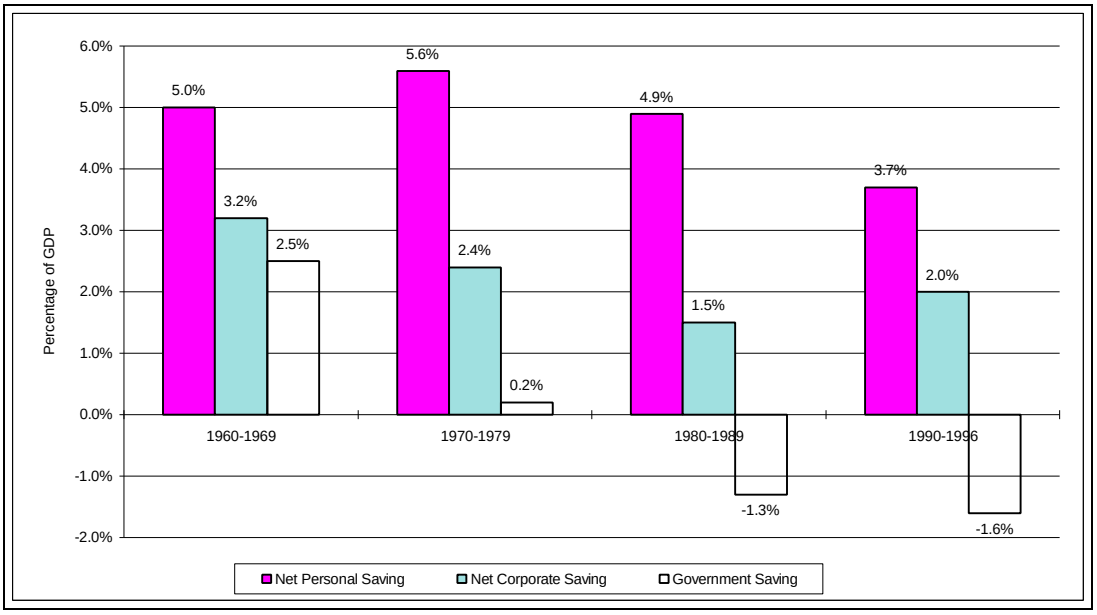
Looking to the future, the most distinctive features of annuities—those involving income options during the liquidation phase—are likely to increase in importance. The average retirement period will probably continue to lengthen as a consequence of rising life expectancies and trends toward early retirement, thereby making prudent retirement cash-flow management all the more critical. Public policy toward saving in general, and annuities in particular, should make meeting these emerging challenges as easy as possible for future retirees.

FIGURE 1.1
NET NATIONAL SAVING IN THE UNITED STATES
(AS A PERCENTAGE OF GDP)



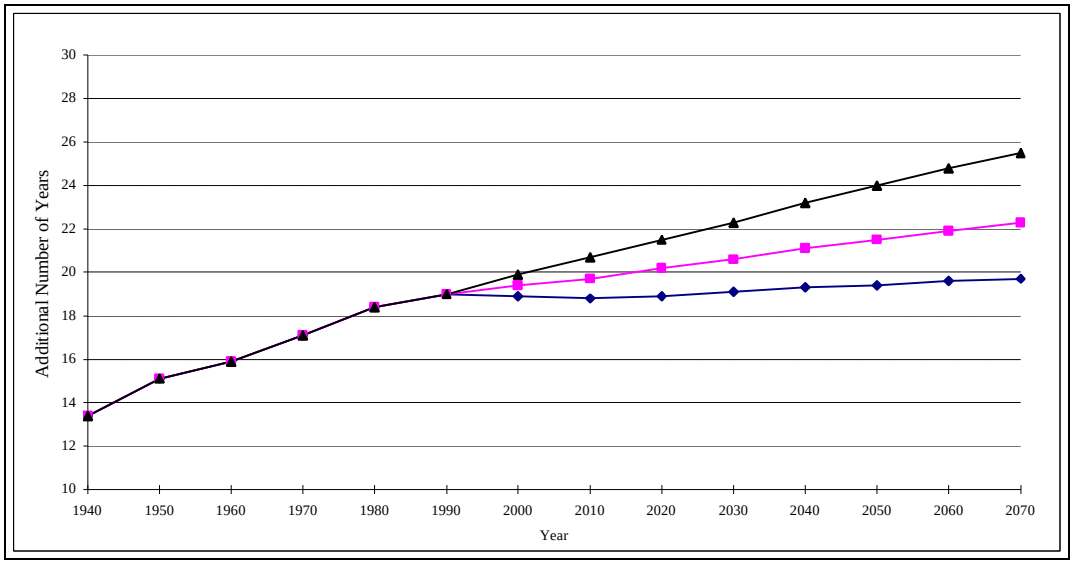
Source: U.S. Department of Commerce, National Income and Product Accounts, *Survey of Current Business,* August 1997.

FIGURE 1.2
COMPONENTS OF NET NATIONAL SAVING (AS A PERCENTAGE OF GDP)



Source: U.S. Department of Commerce, National Income and Product Accounts, *Survey of Current Business*, August 1997.

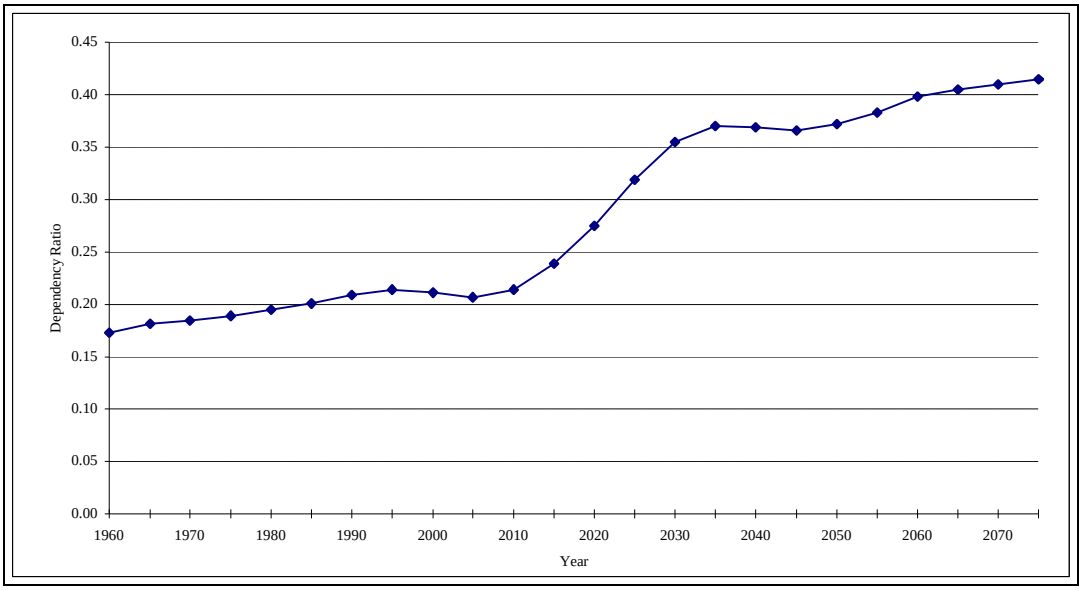
FIGURE 1.3
ACTUAL AND PROJECTED LIFE EXPECTANCY FOR FEMALES AT AGE 65



Note: The figure displays the high, intermediate, and low projections from the *OASDI (Old Age Survivors and Disability Insurance) Trustees Report*.

Source: *1997 OASDI Trustees Report.*

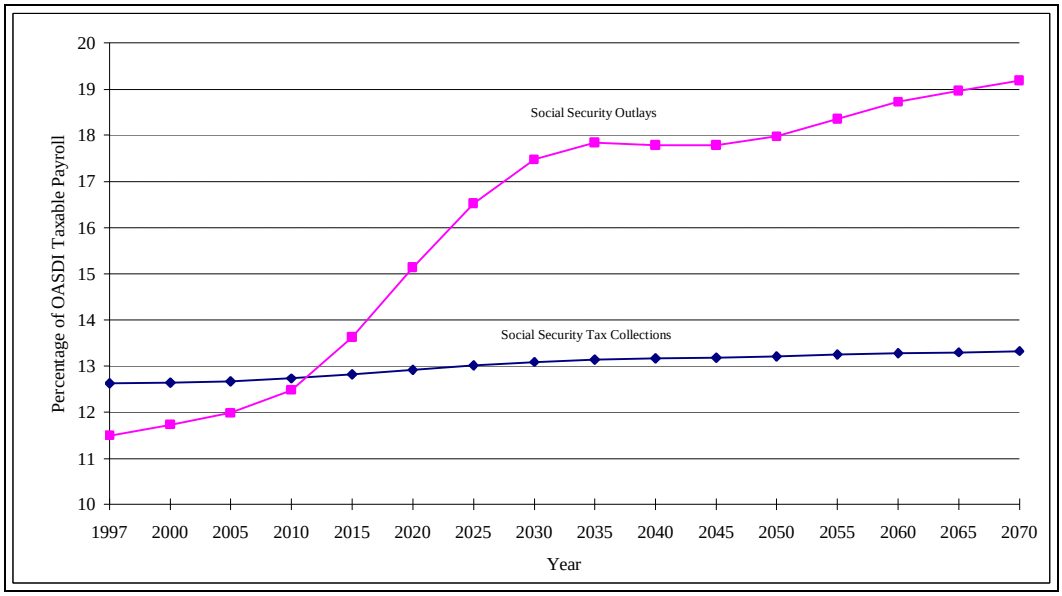
FIGURE 1.4
OLD-AGE DEPENDENCY RATIO (PERSONS AGED 65+ / PERSONS AGED 18–64)



Note: The projected ratios are based on the intermediate projection of the *OASDI Trustees Report*.

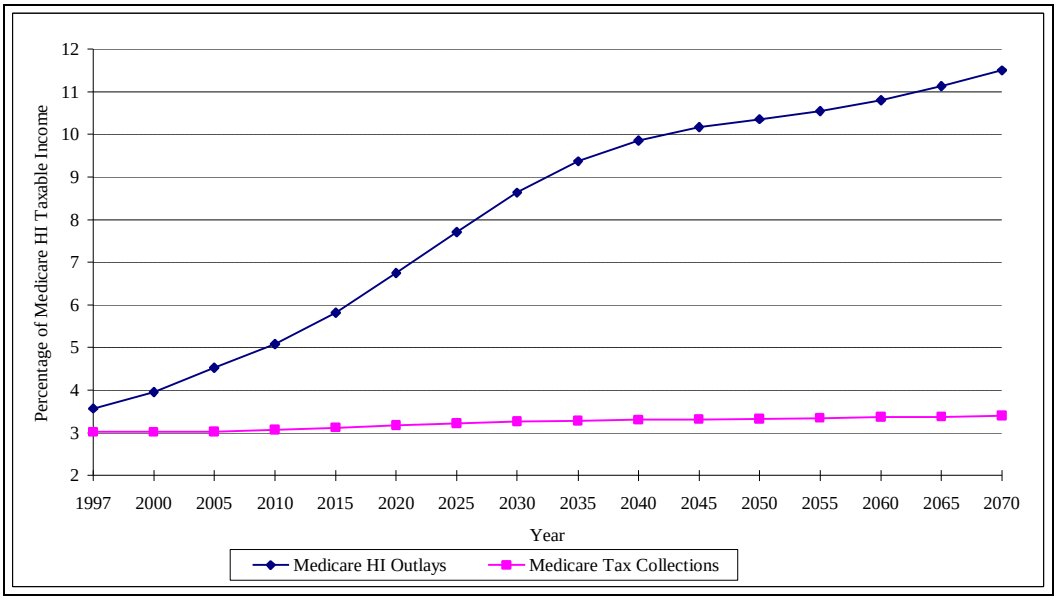
Source: *1997 OASDI Trustees Report*.

FIGURE 1.5
PROJECTED SOCIAL SECURITY TAX COLLECTIONS AND OUTLAYS



Source: *1997 OASDI Trustees Report*.

FIGURE 1.6
PROJECTED MEDICARE HOSPITAL INSURANCE (HI) TAX COLLECTIONS AND OUTLAYS



Source: *1997 OASDI Trustees Report*.

TABLE 1.1
PROJECTIONS OF THE FEDERAL BUDGET DEFICIT
(AS A PERCENTAGE OF GDP)

	Year								
	1996	2000	2005	2010	2015	2020	2025	2030	2035
Discretionary spending grows with inflation									
Without economic feedbacks	1%	2%	2%	3%	4%	5%	7%	8%	10%
With economic feedbacks	1	2	2	3	4	5	8	12	18
Discretionary spending grows with the economy									
Without economic feedbacks	1	2	2	3	5	7	9	11	13
With economic feedbacks	1	2	2	3	5	7	11	16	28

Note: Simulations without economic feedbacks assume that deficits do not affect either interest rates or economic growth. Projections with feedbacks allow deficits to push up interest rates and lower the rate of economic growth.

Source: Congressional Budget Office, *Long Term Budgetary Pressures and Policy Options*, March 1997; and Congressional Budget Office, *The Economic and Budget Outlook, Fiscal years 1998–2007*, January 1997.

TABLE 2.1
SUMMARY OF ANNUITY TYPES

Ownership and Control

Individual vs. Group

Individual annuities are purchased and controlled by a single individual. *Group* annuities are purchased for a group of individuals by a third party, usually an employer, who then retains the rights to control future investments into the account and to terminate the annuity contract.

Accumulation

Single Premium vs. Periodic Premium

Single-premium annuities are purchased through a one-time payment. A *periodic-premium* annuity is purchased through many regular payments over time.

Immediate vs. Deferred

Immediate annuities start paying out income immediately. *Deferred* annuities do not make any payments until a specified date in the future.

Variable vs. Fixed

A *fixed* annuity provides a guaranteed rate of return. A *variable* annuity provides a rate of return based on the performance of a pool of assets.

Qualified vs. Nonqualified

Both *qualified* and *nonqualified* annuities get tax-free accumulation, but the annuitant can also defer the taxes on the money used to purchase a *qualified* annuity.

Liquidation

Life vs. Guaranteed

Life annuities make payments for as long as the annuitant lives. *Guaranteed* annuities guarantee payouts for a certain number of years regardless of whether the individual lives that long.

Single-Life vs. Joint-and-Survivor

Single-life annuities make payments for as long as the annuitant lives. *Joint-and-survivor* annuities continue to make payments as long as either of two individuals is alive.

Flat vs. Graded

Payouts can either be *flat* (remain constant over time) or *graded* (steadily increase).

TABLE 2.2
LIFE INSURANCE ANNUITY PREMIUM INCOME

	Millions of 1994 Dollars			Millions of Dollars		
	Individual	Group	Total	Individual	Group	Total
1975	$ 7,343	$ 20,677	$ 28,020	$ 2,664	$ 7,501	$ 10,165
1976	9,677	26,712	36,389	3,713	10,249	13,962
1977	11,140	25,505	36,645	4,552	10,422	14,974
1978	10,131	27,033	37,164	4,454	11,885	16,339
1979	10,164	26,480	36,644	4,976	12,963	17,939
1980	11,331	29,035	40,366	6,296	16,133	22,429
1981	16,788	28,206	44,994	10,290	17,289	27,579
1982	23,353	29,887	53,240	15,196	19,448	34,644
1983	20,850	24,629	45,479	14,003	16,541	30,544
1984	22,418	38,756	61,174	15,706	27,153	42,859
1985	28,793	45,493	74,286	20,891	33,008	53,899
1986	35,307	77,861	113,168	26,117	57,595	83,712
1987	44,039	71,624	115,663	33,764	54,913	88,677
1988	54,887	74,581	129,468	43,784	59,494	103,278
1989	59,089	78,444	137,533	49,407	65,590	114,997
1990	60,845	85,487	146,332	53,665	75,399	129,064
1991	56,220	78,251	134,471	51,671	71,919	123,590
1992	64,800	75,309	140,109	61,348	71,297	132,645
1993	78,957	81,491	160,448	76,987	79,458	156,445
1994	80,832	73,017	153,849	80,832	73,017	153,849
1995	75,483	80,551	156,034	77,370	82,565	159,935

Sources: American Council on Life Insurance,*1996 Fact Book*; Poterba, *The History of Annuities in the United States,* 1997.

TABLE 2.3
RATIO OF LIFE INSURANCE AND ANNUITY PREMIUMS TO DISPOSABLE PERSONAL INCOME

Year	Life Insurance Premiums	Annuity Premiums
1973	2.75	0.71
1974	2.65	0.74
1975	2.55	0.88
1976	2.48	1.10
1977	2.43	1.08
1978	2.33	1.04
1979	2.23	1.02
1980	2.09	1.15
1981	2.13	1.27
1982	2.19	1.49
1983	2.02	1.22
1984	1.86	1.55
1985	2.04	1.83
1986	2.11	2.67
1987	2.33	2.70
1988	2.07	2.91
1989	1.94	3.04
1990	1.89	3.19
1991	1.87	2.92
1992	1.86	2.95
1993	2.01	3.32

Source: American Council on Life Insurance, *1996 Fact Book*.

TABLE 2.4
THE IMPORTANCE OF VARIOUS REASONS FOR BUYING AN ANNUITY

	Percentage Who Replied	
	Very Important	Somewhat Important
Earnings would not be taxed until the funds were used	73%	17%
Was a safe purchase	61	29
Has a good rate of return	55	31
Wanted a long-term savings plan	51	27
Could get a guaranteed income as long as you live	49	24
Easy way to save	41	35
Wanted a source of funds that could be used for emergencies	49	29
Has a choice of methods of getting the money	39	32

Source: Gallup Organization Survey of Owners of Nonqualified Annuity Contracts, 1997.

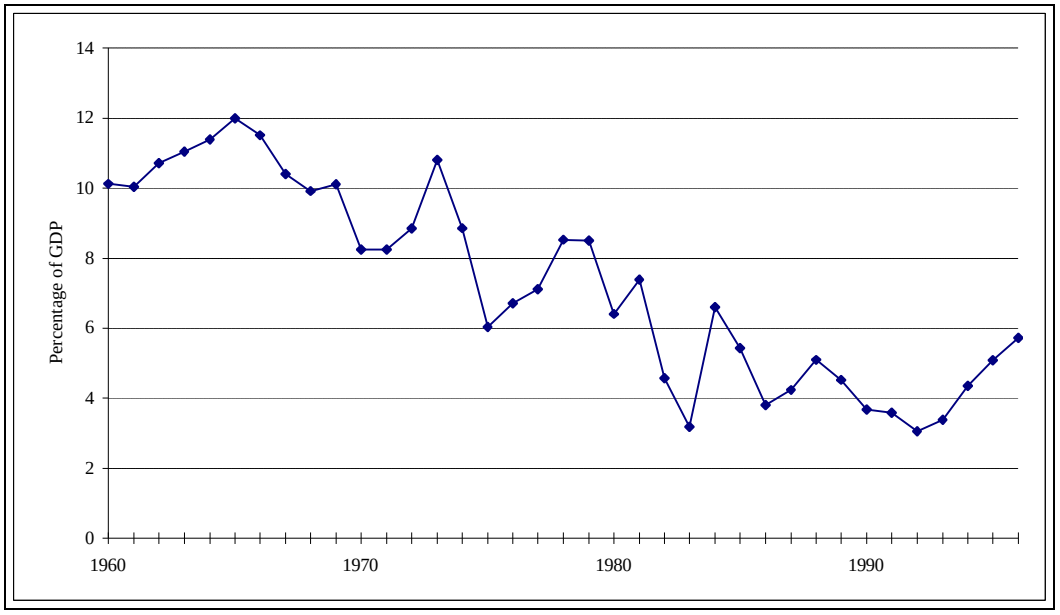
TABLE 2.5
GENERAL POPULATION AND ANNUITANT MORTALITY RATES

	General Population	Annuitant Population
Men		
65	22.2	11.5
70	31.5	18.8
75	46.7	30.9
80	73.7	50.4
85	113.8	79.8
90	169.0	120.6
95	238.4	172.6
100	305.3	236.0
105	380.4	341.9
Women		
65	13.4	7.3
70	19.8	11.5
75	29.1	19.4
80	44.3	33.4
85	69.6	57.6
90	116.7	101.3
95	189.5	158.4
100	259.2	211.3
105	337.1	299.0

Note: Rates are per 100,000 persons for the year 1995.

Source: Mitchell, Poterba, and Warshawsky, New Evidence on the Money's Worth of Individual Annuities, 1997.

FIGURE 3.1
NET NATIONAL SAVING RATE OF THE UNITED STATES (AS A PERCENTAGE OF GDP)



Source: U.S. Department of Commerce, National Income and Product Accounts, *Survey of Current Business,* August 1997.

TABLE 3.1
NATIONAL SAVING FOR THE UNITED STATES, GROSS AND NET (AS A PERCENTAGE OF GDP)

	Period			
	1960–1969	1970–1979	1980–1989	1990–1996
Gross national saving	18.9%	17.4%	15.8%	13.5%
Net national saving	10.7	8.2	5.1	4.1
Depreciation allowances	8.2	9.2	10.7	9.4

Source: U.S. Department of Commerce, National Income and Product Accounts, *Survey of Current Business,* August 1997.

TABLE 3.2
SECTORAL COMPONENTS OF NET NATIONAL SAVING FOR THE UNITED STATES (AS A PERCENTAGE OF GDP)

	Period			
	1960–1969	1970–1979	1980–1989	1990–1996
Net national saving	10.7%	8.2%	5.1%	4.1%
Net private saving	8.2	8.0	6.4	5.7
Net personal saving	5.0	5.6	4.9	3.7
Net corporate saving	3.2	2.4	1.5	2.0
Government saving	2.5	0.2	-1.3	-1.6
Federal saving	40.0	-1.9	-3.2	-3.0
State and local saving	2.1	2.1	1.9	1.4

Source: U.S. Department of Commerce, National Income and Product Accounts, *Survey of Current Business,* August 1997.

TABLE 3.3
PRIVATE INCOME AND SAVING

	Period			
	1960–1969	1970–1979	1980–1989	1990–1996
Ratio of private disposable income to GDP	71.9%	72.4%	73.5%	75.4%
Ratio of private saving to private disposable income	11.5	11.1	8.8	7.6

Source: U.S. Department of Commerce, National Income and Product Accounts, *Survey of Current Business,* August 1997.

TABLE 3.4
AN INTERNATIONAL COMPARISON OF NET NATIONAL SAVING (AS A PERCENTAGE OF GNP)

	Period		
	1982–1989	1990–1994	1982–1994
United States	4.0%	2.9%	3.6%
Japan	17.9	17.8	17.9
OECD Europe	9.6	8.2	8.9
France	7.4	7.0	7.2
Germany	10.0	9.3	9.7
Italy	9.4	6.5	8.3
United Kingdom	4.8	2.7	4.0

Source: *OECD Economic Outlook,* 1996.

TABLE 3.5
INVESTMENT AND INTERNATIONAL TRANSACTIONS (AS A PERCENTAGE OF GDP)

	Period			
	1960–1969	1970–1979	1980–1989	1990–1996
Gross investment	15.4%	16.5%	16.4%	13.7%
Net investment	7.2	7.3	5.7	4.3
Depreciation allowances	8.2	9.2	10.7	9.4
Net foreign investment	0.6	0.2	-1.6	-1.2

Source: U.S. Department of Commerce, National Income and Product Accounts, *Survey of Current Business,* August 1997.

TABLE 3.6
REAL INVESTMENT AND INTERNATIONAL TRANSACTIONS (AS A PERCENTAGE OF REAL GDP)

	Period			
	1960–1969	1970–1979	1980–1989	1990–1996
Gross real investment	12.9%	14.0%	14.4%	13.8%
Net real investment	6.1	6.2	5.0	4.4
Real depreciation allowances	6.8	7.8	9.4	9.4
Net real foreign investment	0.5	0.2	-1.5	-1.2

Note: Percentages are based on real values of saving and GDP, measured in constant 1992 dollars.

Source: U.S. Department of Commerce, National Income and Product Accounts, *Survey of Current Business,* August 1997.

GLOSSARY

Accumulation Phase: The phase of an annuity contract during which payments are made from the annuitant to the insurer and assets are accumulated within the annuity account.

Actuarially Fair Annuity Contract: An annuity contract that has an actuarial present value equal to the purchase price of the annuity.

Actuarial Present Value: The expected value, in current dollars, of the income stream provided by an annuity contract; income received in the future is discounted according to a safe interest rate. This accounts for the fact that a dollar today is worth more than a dollar in the future because it can earn interest if invested between now and the future date. The expected value in current dollars also reflects the survival probabilities of the individual purchasing the annuity contract. Thus, the actuarial present value of an annuity is found by summing all potential payments, discounted according to how far in the future the payment is to be received and multiplied by the probability that the individual lives that long.

Adverse Selection: A problem, common to insurance markets, that arises because individuals tend to know more about their survival probabilities than the insurer and thus are more likely to purchase annuities if they expect to live for a long time. Thus, individuals who purchase annuities tend to have longer life expectancies than do members of the general population with otherwise similar characteristics.

Annuitant: The person to whose life reference may be made in determining the duration of payments under an annuity contract. Often, but not always, the annuitant and the owner are the same individual. In most instances, it is assumed in this paper that the annuitant and the owner are the same individual. Thus, in the case of an individual annuity, the annuitant retains the rights to control future payments into the account and to terminate the contract. If the annuity is purchased for the annuitant by a third party, as in a group annuity, the third party retains the rights of ownership and control of the account.

Deferred Annuity: An annuity whose payout period is not scheduled to begin for a period of time longer than one year.

Fixed Annuity: An annuity that provides a guaranteed, contractually specified return on account balances during the accumulation phase of the annuity contract.

Flat Annuity: An annuity that makes regular, fixed payments during the liquidation phase of the annuity contract. With a positive inflation rate, the value of these payments decreases in real terms over the life of the annuity contract.

Graded Annuity: An annuity whose regular payouts increase over time during the liquidation phase of the annuity contract. The increasing payment amounts offer some protection from inflation but are not directly indexed to the inflation rate.

Group Annuity: An annuity purchased for a group of individuals by a third party, usually an employer. The third party retains the rights to control future investments into the annuity and to terminate the annuity contract. Group annuities are often an integral part of an employer-driven defined benefit plan.

Guaranteed Annuity: An annuity that pays income for either the life of the annuitant or a fixed number of years, whichever comes last. Through such contracts, individuals can guard against the possibility that they might die soon after the inception of benefits, before they have recouped a significant fraction of their contributions.

Immediate Annuity: An annuity whose payout period begins close to the time of purchase.

Income Annuity: An annuity that converts accumulated assets into a stream of income, usually through monthly payouts, during the liquidation phase of the annuity contract.

Indexing: Relating the stream of annuity payouts to the inflation rate, so that the payouts rise and fall with the rate of inflation. Indexing keeps the real value of the annuity payout constant over time.

Individual Annuity: An annuity purchased by an individual who retains the rights of ownership and control of the account.

Inside Buildup: Capital accumulation within the annuity account. This accumulation can be a regular fixed amount per time period, as in a fixed annuity, or an amount that depends on investment performance, as in a variable annuity.

Joint-and-Survivor Annuity: An annuity that pays a stream of income for a period of time that depends on the lives of both the annuitant and another individual (usually the annuitant's spouse); monthly payments continue until the deaths of both individuals.

Life Annuity: An income annuity that provides a regular periodic payout for the life of the annuitant.

Liquidation Phase: The phase of an annuity contract during which payments are made from the insurer to the annuitant.

Nonqualified Annuity: An annuity that allows the deferral of taxation on the capital income accumulated within the annuity account but does not allow the deferral of taxes on the initial purchase amount.

Periodic-Premium Annuity: An annuity typically characterized by an accumulation period during which the owner makes regular periodic payments to the annuity provider. Annuities with periodic payments are commonly used in the context of 401(k), 403(b), and other pension plans. In most cases, the periodic payments are flexible and are often withheld directly from an individual's paycheck.

Qualified Annuity: An annuity that allows the deferral of taxes on the capital income accumulated within an annuity account and, unlike a nonqualified annuity, allows the deferral of taxes on the initial purchase amount of the annuity.

Reverse Annuity Mortgage: A special form of annuity contract that allows homeowners to convert home equity into a regular income stream for the duration of their lives.

Single-Premium Annuity: An annuity purchased through a single payment.

Survivor: A second individual, usually the annuitant's spouse, who is included in a joint-and-survivor annuity contract. The annuity payments continue until the deaths of both the annuitant and the survivor.

Tax Deferral: Postponement of taxes until a point of time in the future, allowing the individual to invest that money until the time when the payment must be made in the future.

Transactions Costs: The costs an insurer incurs in the acquisition, investment, and management of its annuity contracts.

Variable Annuity: An annuity that provides variable returns on account balances during the accumulation and/or the liquidation phase as determined by the investment performance of the individual's customized portfolio.

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