McKinsey Global Institute

Talkin' 'Bout My Generation: The Economic Impact of Aging US Baby Boomers

June 2008

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The McKinsey Global Institute (MGI), founded in 1990, is McKinsey & Company's economics research arm. MGI's mission is to help business and government leaders develop a deeper understanding of the evolution of the global economy and provide a fact base that contributes to decision making on critical management and policy issues.

MGI's research is a unique combination of two disciplines: economics and management. By integrating these two perspectives, MGI is able to gain insights into the microeconomic underpinnings of the broad trends shaping the global economy. MGI has utilized this "micro-to-macro" approach in research covering over 15 countries and 28 industry sectors, on topics that include economic productivity, global economic integration, offshoring, capital markets, health care, energy, demographics, and consumer demand.

MGI's research is conducted by a group of full-time MGI fellows based in offices in San Francisco; Washington, DC; London; and Shanghai and led by MGI's director Diana Farrell. MGI project teams also include consultants drawn from McKinsey's offices around the world and are supported by McKinsey's network of industry and management experts and worldwide partners. In addition, MGI teams work with leading economists, including Nobel laureates and policy experts, who act as advisers to MGI projects.

MGI's research is funded by the partners of McKinsey & Company and is not commissioned by any business, government, or other institution. Further information about MGI and copies of MGI's published reports can be found at www.mckinsey.com/mgi.

Preface

Talkin' 'Bout My Generation: The Economic Impact of Aging Baby Boomers is the result of a yearlong study by the McKinsey Global Institute (MGI) in partnership with McKinsey's Consumer Insight Practice. The work builds on previous MGI work on the impact of demographics on national economies, as well as MGI's work on shifting patterns of consumer demand in the world.[1] This study presents new data and analysis on how the Baby Boomers, one of the largest US birth cohorts relative to population in the last century, will shape the US economy over the coming decades as they age and retire.

In November 2007, we, along with our colleagues David Court and John E. Forsyth, published an article "Serving Aging Baby Boomers" in *The McKinsey Quarterly*, highlighting results of this research from the perspective of businesses seeking to serve an aging population of consumers.[2] In that piece we focused on the significant opportunities as well as the challenges this demographic shift presents for companies serving aging consumers. In this report, we take a different perspective. Here, we focus on the question of what impact the aging of the Boomers will have on the overall US economy, and what actions policy makers and business leaders must begin to take now to minimize the risks to the economy posed by this demographic transition.

David Court, a McKinsey director in Dallas and global knowledge leader for the Consumer Insight Practice; Eric Beinhocker, a senior fellow with MGI in London; and John Forsyth, an expert principal with the Consumer Insight Practice in Stamford,

1 See McKinsey Global Institute Reports: The Coming Demographic Deficit: How Aging Populations Will Reduce Global Savings, December 2004; *From* 'Made in China' to 'Sold in China': The Rise of the Chinese Urban Consumer, November 2006; *The* 'Bird of Gold': The Rise of India's Consumer Market, May 2007. They can be found at http://www.mckinsey.com/mgi/

2 David Court, Diana Farrell, and John E. Forsyth, "Serving Aging Baby Boomers," *The McKinsey Quarterly,* November 2007.

Connecticut, worked closely with me to provide overall leadership on both stages of this project. The project team for this report was managed by Ezra Greenberg, an expert with MGI in Washington, DC, who also led the economic analysis and modeling efforts, and it included Jonathan Ablett of the North American Knowledge Center; Suruchi Shukla, a McKinsey consultant from the Asia House office in Frankfurt; Geoffrey Greene, an external adviser to MGI on econometric modeling; and Nell Henderson, an MGI senior editor in Washington, DC.

This report built upon our earlier work. That project team was managed first by Vanessa Freeman, a consultant in McKinsey's London office and then by John Chao, a consultant from McKinsey's Houston office. The market research was led by Lora Chajka-Cadin, an expert with McKinsey's Consumer Insight Practice in Boston. We were supported by a superb team that included Vivek Banerji, Matthew Klusas, Mette Lykke, Jeongyeon Shim, and Ned Welch.

We also received valuable input and guidance from a number of senior McKinsey partners who committed their time to serve on a steering committee to review the work. They include Blair Crawford, Martin Elling, Dave Elzinga, Betsy Holden, David Hunt, John McPherson, Michael Patsalos-Fox, Tim Welsh, and Michael Zea.

Our team benefited substantially from interviews and discussions with a number of experts, including Alicia Munnell and Anthony Webb of the Center for Retirement Research at Boston College, and Martin Neil Baily of the Brookings Institution.

Finally, we would like to thank several members of MGI's professional staff who contributed their efforts to this project: Tim Beacom, for his research assistance; Rebeca Robboy, MGI's external relations manager; and Deadra Henderson, our practice administrator. We also thank Anthony Lee of the North America Financial Services Practice, and the superb staffs of McKinsey's North American Knowledge Center, the McKinsey Knowledge Center in India, and the production and technical services of the Firm.

Our goal with this and other MGI reports is to provide business leaders, policy makers, and other decision makers with facts and insights that lead to better understanding of key trends in the global economy. As with all MGI projects, this research is independent and was not commissioned or sponsored in any way by any business, government, or other institution.

Diana Farrell
Director, McKinsey Global Institute
June 2008
San Francisco

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Executive Summary

America's "Baby Boom" generation has dominated the US economy for more than a quarter-century. Our research shows that the nearly 79 million Baby Boomers have earned record levels of income, generated great wealth, and spurred economic growth. But they have also spent at record levels, failed to save, and accumulated unprecedented levels of debt. Now, as the oldest Boomers near retirement, we estimate that approximately two-thirds of Early Boomer households, who are aged 54 to 63, are financially unprepared for retirement—that is, they have not accumulated enough savings to maintain their lifestyle as they age. And many of them do not realize they are ill-prepared. Meanwhile, their predicament is worsening with the fall in home values and stock prices that began in 2007.

The Boomers' aging also will be felt throughout the economy. As the Boomers grow older, they will work and spend less, slowing real GDP growth to a more modest pace than in recent decades: from the 3.2 percent average annual rate enjoyed since 1965 to 2.4 percent over the coming three decades. While the bursting of the housing bubble and resulting credit crisis have raised concerns about economic performance in the short term, the coming retirement of the Baby Boomers will pose challenges to the US economy for more than three decades.

But our research also shows that these challenges can be met. Our analysis shows that enabling the Boomers to work later in life would significantly benefit both individual households and the broader economy. By increasing the median retirement age by about two years—from 62.6 today to 64.1 by 2015—the share of unprepared Boomer households could be halved from 62 percent to 31 percent. And the additional workers would boost real GDP growth.

The Boomers have been adaptable and innovative throughout their lives and are already starting to redefine aging and retirement. Our survey of Boomers facing retirement shows that most expect to work later in life. However, there are also many barriers to doing so. These range from the costs of America's health care system, to unintended consequences of labor laws and pension regulations, to corporate attitudes toward older workers. It is essential that policy makers and business leaders work together to remove these barriers and prevent the Boomers' retirement from becoming a multi-decade drag on US growth.

These conclusions are supported by a yearlong research project conducted by the McKinsey Global Institute (MGI) in partnership with McKinsey's Consumer Insight Practice. The research included construction of a database of US household financial data cut by age, income, and wealth from 1962 through the third quarter of 2007; the creation of an econometric forecasting model that projects Boomer and other cohort household finances to 2035; a survey of over 5,100 households of Boomers and the Silents (the generation that preceded the Boomers), and 32 in-home ethnographic interviews with Boomer households approaching or just past retirement. We briefly outline the findings from this research below. Readers interested in the full results and analyses are directed to the main chapters of the report, while those interested in our methodology, assumptions, and data sources are directed to the appendixes.

BOOMERS HAVE ENJOYED RECORD EARNINGS—BUT EIGHTY PERCENT OF THEIR GAINS ARE FROM ONETIME FACTORS

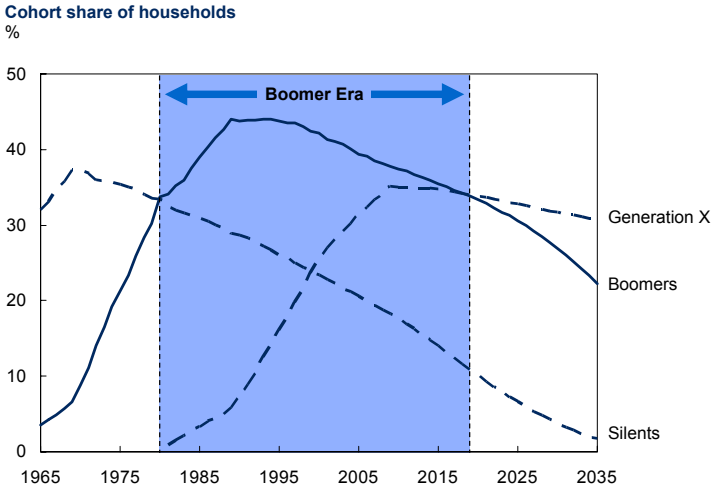
The Baby Boomers have had an outsized impact on the US economy since their birth in the postwar period from 1945 to 1964. At 45 million households strong, they have accounted for the greatest share of earnings and consumption in the economy since 1980. We project that their era of economic dominance will last until 2019 (Exhibit 1).

The Boomers have earned more at every age in real terms than previous generations. Exhibit 2 compares Boomer earnings by age with those of the Silent generation, the cohort that preceded the Boomers. We project that the Boomers' earnings will peak in 2015 for the Early Boomers (born from 1945 to 1954) at $90,000 per household, and in 2025 for the Late Boomers (born from 1955 through 1964) at $106,000.[1]

1 All income, net worth, and spending figures are expressed in 2000 dollars. Our econometric model captures 100 percent of household income and spending in the economy. Following national accounting standards, we include income and spending provided in-kind to households. See Chapter 1 and Appendix B for more details.

Exhibit 1

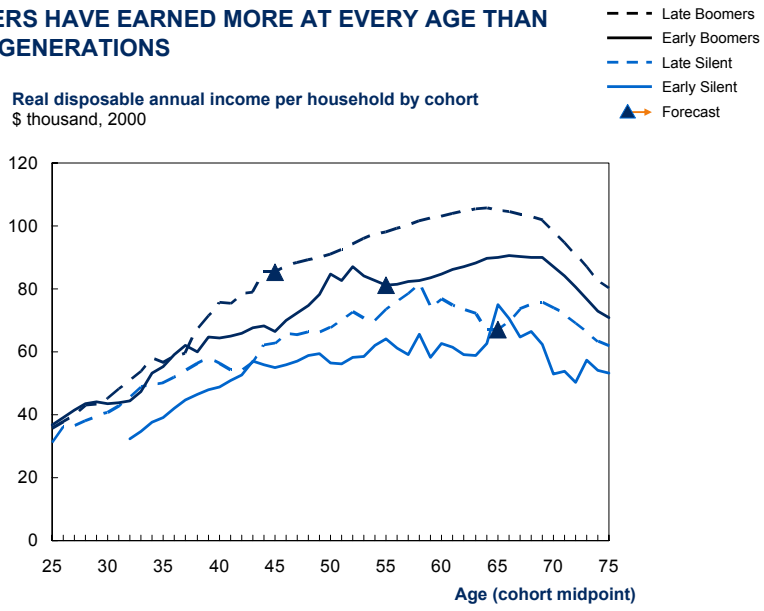
THE SIZE OF THE COHORT HAS CREATED A "BOOMER ERA" FROM 1980 TO 2019



Source: McKinsey Global Institute US Consumer Model, v7.2

Exhibit 2

BOOMERS HAVE EARNED MORE AT EVERY AGE THAN PRIOR GENERATIONS

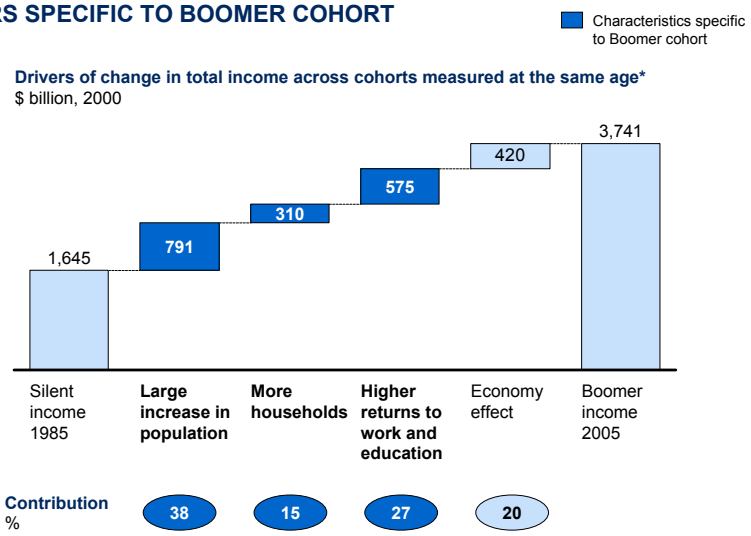


Source: McKinsey Global Institute US Consumer Model, v7.2

Looked at in aggregate, the Boomers have earned more than twice as much as the Silent generation during the same age span (Exhibit 3). But our analysis shows that 80 percent of the Boomers' increased earnings was driven by three specific onetime factors that are not likely to be repeated for future generations.

Exhibit 3

EIGHTY PERCENT OF BOOMER INCOME GROWTH DUE TO ONETIME FACTORS SPECIFIC TO BOOMER COHORT



* Decomposition compares 10-year cohorts at the same age: Early Boomers vs. Early Silents at age 55; Late Boomers vs. Late Silents at age 45. Age refers to cohort midpoint.

Source: McKinsey Global Institute US Consumer Model, v7.2

First is the sheer size of the Boomer cohort. The Boomers increased the size of the US labor force, boosting output and pocketing the income associated with that growth. If we assume that on average the Boomers lived as did the previous Silent generation, with the same number of adults and the same income per household, the simple fact that there were more of them would account for 38 percent of their increased aggregate income.

But the Boomers also earned more because they lived very differently than the Silents. One key difference was that Boomer women poured into the workplace at rising rates, further boosting the size of the labor force. This change was closely linked to a set of social trends: The Boomers have married and had children later in life, have divorced at higher rates, or have chosen not to marry at all. As a result, the Boomers are now divided into a larger number of smaller households than in previous generations, with fewer adults per household. More households for this generation meant more earners. Assuming that the Boomers had the same average income as the Silents, this shift provides a second explanation for the Boomers' greater collective income and accounts for 15 percent of the difference.

Third, and finally, the Boomers have enjoyed greater returns to both education and work than did the previous generation, which boosted their average household income. They became more educated than previous generations, in large part because of the educational gains by Boomer women. And they did so at a time when the labor force was shifting from industrial work to service and knowledge jobs, increasing the returns to education. They were also better able than other cohorts to capitalize on changes in the economy stemming from productivity growth, technological innovation, and globalization during this period. We estimate that higher returns boosted aggregate income by 27 percent.

The remaining 20 percent of their income gains is due to factors not specific to the Boomers—it is the gain they received by benefiting from economic growth at least as much as did everyone else over this period.

None of the three factors driving differential growth in Boomers' income is likely to be repeated. It is unlikely we'll see another cohort as proportionally large as the Boomers for some time to come. Likewise, the social trends that have increased household numbers seem to have largely played out and stabilized. Finally, female educational attainment and workforce participation also appear to have peaked.

Thus, while future generations will likely see real income increases due to productivity growth and other fundamental economic factors, these gains are unlikely to occur at the pace enjoyed by the Boomers.

THE MISSING PEAK—DESPITE HIGH INCOMES, THE BOOMERS HAVE FAILED TO SAVE

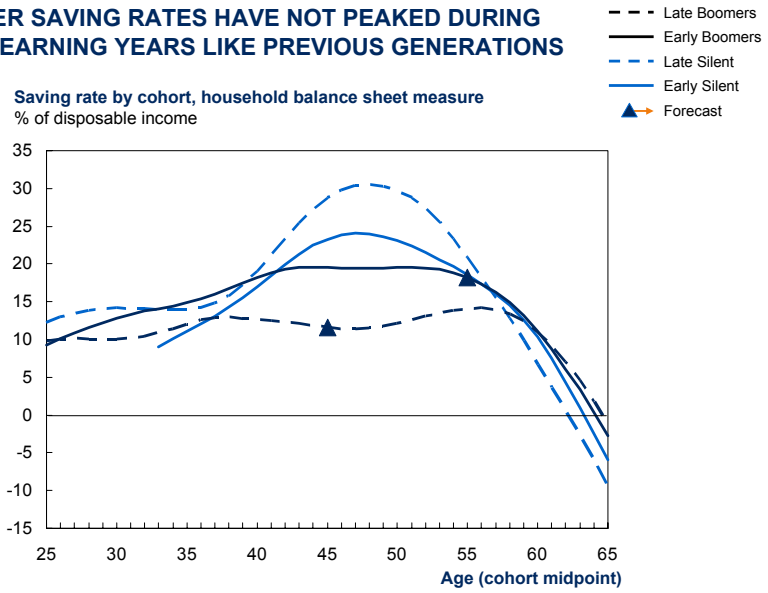
But just as the Boomers have been record earners, they have also been record spenders and borrowers. The Boomers have been the major spenders in the economy since the mid-1980s, and they have spent more in real terms at every age than previous generations. The Boomers' spending spree has helped drive consumption to account for more than 78 percent of GDP growth in the United States from 1995 to 2005 versus 64 percent two decades earlier.

But what has really separated the Boomers from previous generations has been their failure to save. Historically, households have followed a life-cycle pattern where they have modest savings in their early years when their incomes are low; then they accumulate savings in their peak earning years, typically their forties and fifties; and then they draw down those savings in retirement in their sixties and seventies. Exhibit 4 shows this savings life cycle for the Boomers versus the Silents. Both the Early and Late Silents show a distinct savings peak during their

high-earning years. But the peak is missing for the Early Boomers, and the Late Boomers appear to be on an even lower savings trajectory. Our analysis shows that the Boomers' missing savings peak accounts for most of the collapse in the US household saving rate from its peak of over 10 percent in the mid-1980s to around 2 percent today. In 2005, the Boomers had 47 percent of national disposable income but contributed only 7 percentage points to national savings. At the same point in their life cycle in 1985, the Silents contributed twice as much to national savings despite controlling proportionally far less income.

Exhibit 4

BOOMER SAVING RATES HAVE NOT PEAKED DURING PRIME EARNING YEARS LIKE PREVIOUS GENERATIONS



Source: McKinsey Global Institute US Consumer Model, v7.2

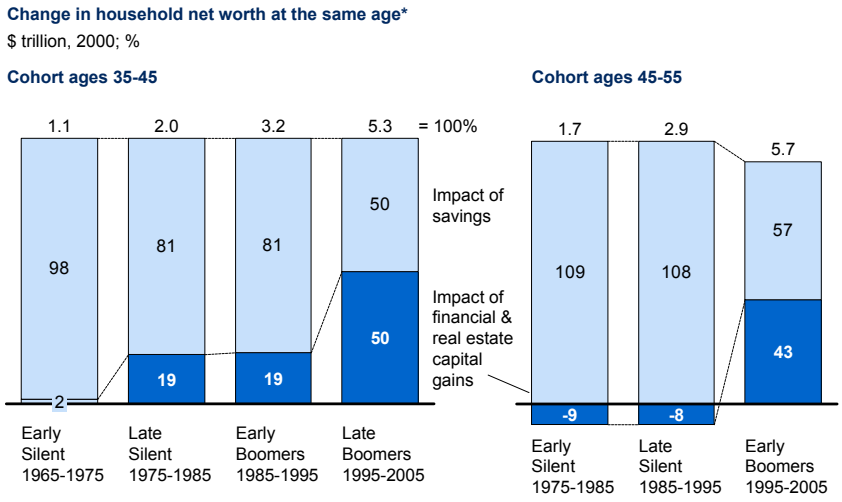
Our analysis highlights two critical reasons for this missing peak in Boomer saving—the "wealth effect" from asset appreciation and increased access to credit. First, financial market innovations in the 1980s and '90s turned more Americans into both investors and borrowers. During the Boomers' lifetimes, mutual fund penetration among 50- to 59-year-olds has climbed from 14 percent of households to 64 percent. When Boomers saw their stocks and home values soar during this period, they felt emboldened to spend more, and thus save less than they would have otherwise—the so-called wealth effect. Our analysis shows that almost half of the increase in net worth for Early Boomers has come from asset appreciation, whereas at the same age the Silents relied on saving to increase their net worth (Exhibit 5).

At the same time, the Boomers borrowed more. The share of households with mortgages almost doubled, and the percentage with revolving credit increased by

25 percent. The net effect is that the Boomers are carrying far more debt later in life than previous generations. The Boomers have nearly 1.5 times the amount of liabilities, and their average liability-to-net worth ratio is 54 percent higher than the Silents at the same age. This is even before the full effects of the housing market decline have played out.

Exhibit 5

BOOMERS HAVE BENEFITED DISPROPORTIONATELY FROM ASSET APPRECIATION



* Age refers to cohort midpoint.
Source: McKinsey Global Institute US Consumer Model, v7.2

TWO-THIRDS OF BOOMERS ARE UNPREPARED FOR RETIREMENT

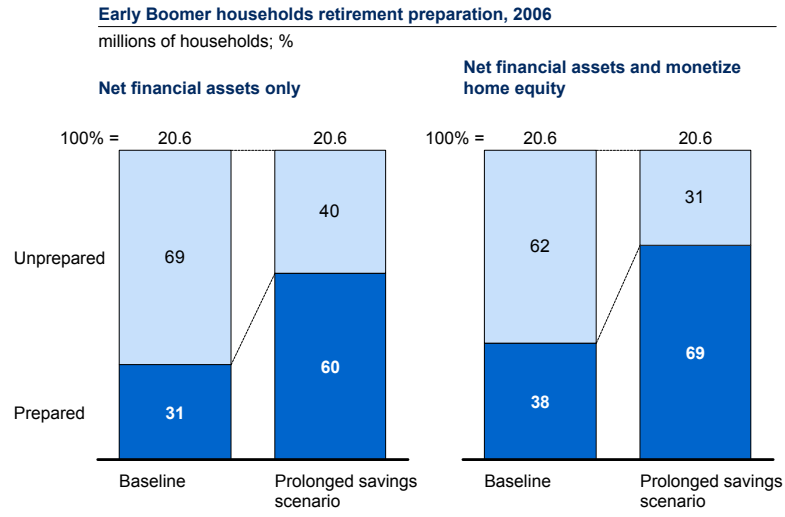
We estimate the net result of the Early Boomers' weak saving is that approximately two-thirds of these households are unprepared for retirement—that is, they will not be able to sustain approximately 80 percent of their spending as they age.[2] Even if we allow that these households can tap their home equity, the proportion of prepared Early Boomer households is no higher than 38 percent (Exhibit 6). Thus, without major changes in behavior, about two-thirds of Boomer households are heading for sharp drops in their lifestyle.

This result may be surprising to some because both aggregate and average real net worth are higher for the Boomers than for the Silent generation. But the aggregate and average figures are held up by a concentration of Boomers who are indeed very rich. For example, Early Boomers with net worth above $125,000 in 2005 owned 42 percent of total cohort net worth, versus 36 percent for Early Silents at the same age.

2 See Chapter 4 for more details on our approach to defining retirement preparedness.

Exhibit 6

PROLONGING SAVING HAS A DRAMATIC IMPACT ON THE NUMBER OF BOOMERS WHO CAN MAINTAIN THEIR LIVING STANDARDS



Source: McKinsey Global Institute US Consumer Model, v7.2; US Aging Consumer Survey, 2007

Looking more closely across the distribution of income, one sees that many middle-income and even upper-income families will struggle to maintain their lifestyles. Less than half of Early Boomer households earning $60,000 to $90,000 per year are prepared for retirement, even if home equity is included. Of course, lower-income families will face the greatest difficulties—just 18 percent of households earning less than $30,000 per year are prepared for retirement (25 percent if housing equity is included).

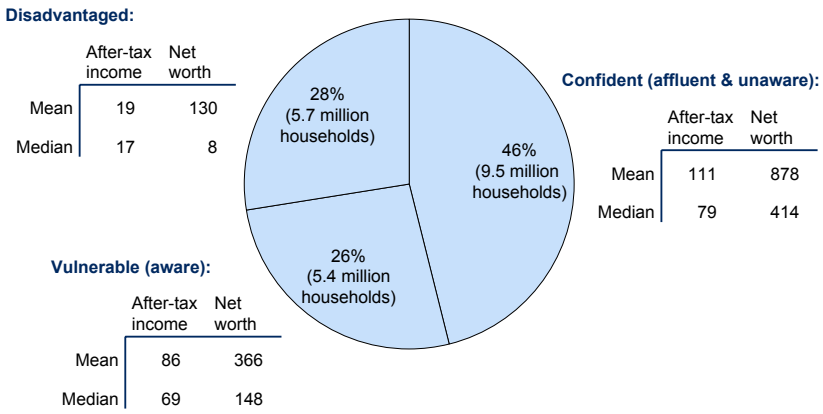
In our survey, we found that many unprepared households are worried about their financial future but that many others are unaware of their situation. We concluded that the Boomers, in facing retirement, could be divided into three distinct attitudinal groups—the *confident*, the *vulnerable*, and the *disadvantaged* (Exhibit 7). These groups broadly correlated with the economic condition of the households in them, but had a number of specific characteristics:

- **Confident**—This group accounts for almost half of Boomer households, and they believe they are well-prepared financially for the future. This is the richest, healthiest, best educated, most married, and most optimistic group. However, there are two types of confident households that share similar attitudes and aspirations but have different financial means. The "affluent confidents" have the wherewithal to fulfill their aspirations, while the "unaware confidents" share these aspirations but do not have the resources to meet them.

Exhibit 7

BOOMERS FALL INTO THREE ATTITUDINAL GROUPS

Distribution of Early Boomer household by attitudes, 2006
100% = 20.6 million households; $ thousand, 2000



Note: Boomers aged 50-61 when surveyed used as a proxy for total Boomer cohort.
Source: McKinsey Global Institute US Consumer Model, v7.2; US Aging Consumer Survey, 2007

- **Vulnerable**—This group accounts for a little more than a quarter of the total. These households have lower income than the confidents and less than half the net worth. They also tend to have lower education levels and a lower likelihood of being married. Nearly 70 percent of these households are unprepared for retirement—but they are aware of their predicament. The vulnerable households have worries about their finances, their health, and the danger of loneliness in retirement. Many are frustrated with their lives and pessimistic about the future and do not believe they can count on family or the government to bail them out.

- **Disadvantaged**—A little more than a quarter of Boomer households falls into the disadvantaged category. These Boomers have had low incomes throughout their lives and are the least educated, least likely to be married, and the most likely to have the poorest health. They worry about the affordability of health care and whether government programs will be there to support them. More than three-quarters are unprepared for retirement.

WORKING TWO YEARS LONGER CAN SIGNIFICANTLY BOOST BOOMER PROSPECTS

Despite the stark predicament of many Boomer families, it is not too late to take action. The Boomers will have to postpone retirement to finance it—working longer to build the savings they will need. Our analysis shows that if Early Boomers

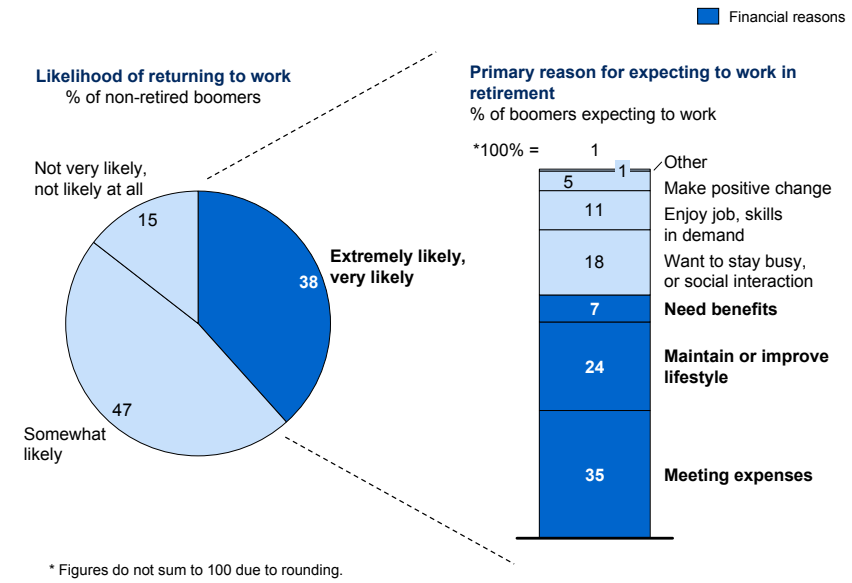
can continue to accumulate assets for an extra five years, shifting the average point at which they begin to draw down their assets from age 65 to 70, the number of unprepared households would be cut by about half (see Exhibit 6). We estimate that this would require their median retirement age to rise from 62.6 today to 64.1 by 2015—an increase of about two years.

An increase in the median retirement age of this magnitude may not sound like much, but this is a number that has shifted slowly: Over the three decades from 1970 to 2000, the median retirement age declined by the same amount. So the challenge is to reverse that trend, but at a much more rapid pace.

Such change is very possible. Life expectancies are increasing. Our survey shows that most Boomers are aware that they will need to do some kind of work past the traditional retirement age. As Exhibit 8 shows, 85 percent of Boomers think it is at least somewhat likely they will continue to work. Two-thirds of those most likely to keep working foresee themselves doing so primarily for financial reasons.

Exhibit 8

FINANCIAL NEEDS ARE PRIMARY REASONS FOR WORKING LONGER



* Figures do not sum to 100 due to rounding.
Source: US Aging Consumer Survey

Clearly, working longer will not be enough to ensure that all unprepared Boomers can maintain their living standards in retirement. First, even if Boomers work longer, roughly a third are still not prepared for retirement. Of this group, half have annual incomes below $30,000 and about three-quarters have incomes below $60,000. Ninety-five percent of the unprepared households have net worth lower than $100,000.

Second, not all of those saying they intend to work will be able to do so. Many will be unable to keep working because of health problems or other age-related difficulties. Our survey found that half of the Boomers who have retired early did so for health reasons. A significant majority of those who retired for health reasons are in vulnerable or disadvantaged households, precisely those who most need to keep working. Also, nearly half of Boomers are in physically demanding occupations such as construction, production, and some service jobs that may make it necessary for them to switch jobs, which is difficult later in life.

But policy makers and business leaders must act to enable those who can work longer to do so. Working longer is also the best answer for the economy as a whole. To make up the savings gap, the Boomers also could begin sharply cutting their spending. However, as Exhibit 9 shows, this would dampen overall economic growth. Working longer, on the other hand, would boost labor force participation, thereby increasing output growth. Enabling Boomers to work longer would add more than $12 trillion to US GDP over the next three decades—an amount equivalent to one year of GDP today.

Although there would be clear benefits to enabling the Boomers to work longer, there are significant legal and institutional barriers that need to be overcome. They include a variety of disincentives for both employers and older workers. Government policy makers and businesses should make several specific changes. They include:

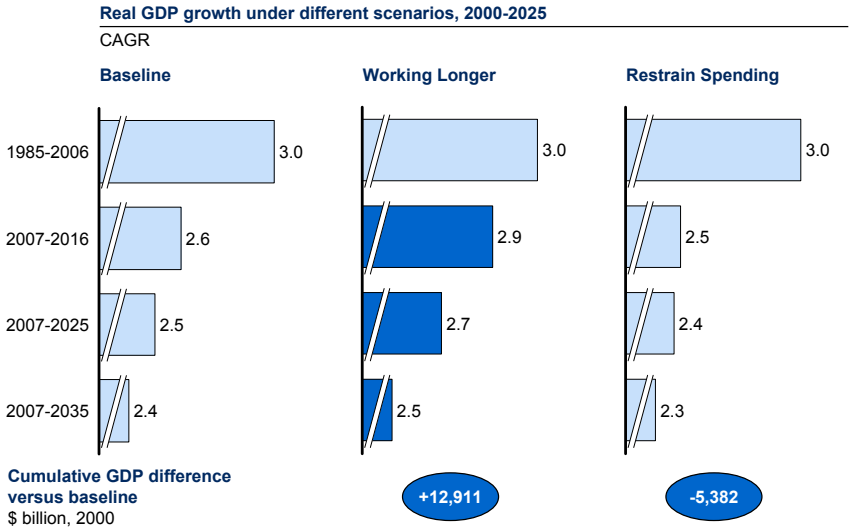
- **Reallocating health insurance costs for older workers.** Insurance costs climb with age, creating a disincentive for businesses to retain or hire older workers. And although Medicare covers retirees aged 65 and over, the program covers little or none of the health care costs of employees at this age if they work for companies providing insurance. The issues of insuring older workers have been largely ignored in the debate over health reform, but they require attention and action.

- **Enabling businesses to offer flexible work arrangements to mature workers.** Many Boomers say they are willing to keep working if they can do so part time, or work from home, or gradually reduce their hours and pay. Such programs are already widespread in government and educational institutions, but businesses have held back partly out of concern they might violate federal laws on taxes, pensions, and age discrimination. Policy makers should amend these laws to remove such concerns. Businesses then should offer more flexible work arrangements. Workers, in turn, will have to be flexible on pay and benefits.

- **Reforming private pensions and Social Security to remove disincentives to working longer.** Many defined benefit pension plans calculate benefits according to formulas that encourage workers to retire early. Businesses and unions should rewrite the rules to remove disincentives to working longer. Similarly, lawmakers should change the way Social Security retirement benefits are calculated to reduce disincentives to working more than 35 years.

Exhibit 9

WORKING LONGER IS THE BEST OPTION BECAUSE OF WIDER SPILLOVERS IN THE ECONOMY



Source: McKinsey Global Institute US Consumer Model, v7.2

Early Boomers, aged 54 to 63 today, who are unprepared for retirement will have to rely primarily on working longer to bolster their finances. But the Late Boomers, aged 44 to 53, have more time to also boost savings by trimming their spending. They should do so, but they need help. Lawmakers should reform and simplify the tax code to increase incentives to save. More businesses should offer employee savings programs, such as 401(k) plans and individual retirement accounts (IRAs) with "automatic" features, such as automatic enrollment, escalation of savings rate over time, and investment into diversified portfolios.

Even with all these actions, many Boomers will rely on Social Security and Medicare in their senior years. Policy makers will have to find ways to sustain these programs, at least for the most disadvantaged households. Otherwise, we will see a resurgence of poverty among the elderly—precisely the problem these programs were created to eradicate.

These changes can be made. But all of the parties involved—government, employers, unions, and the Boomers themselves—will need to act.

• • •

With the impending retirement of the Baby Boomers, the United States is facing a multi-decade economic challenge. However, the Boomers are also a resilient and innovative generation that has lived through and driven major social and technological changes. The Boomers who currently lead our businesses and political institutions need to reinvent retirement and create a more flexible labor market that enables and encourages this generation to work and save later in life.

The Boomers in their sunset years face a choice. They can leave the economic stage as the generation that had it, spent it, and left holes in the US economy for future generations to fill. Or they can be the generation that reinvented America throughout their lives.

1. The Age of Aquarius

In February 2008, Kathleen Casey-Kirschling, a retired teacher from New Jersey, became the first member of the US "Baby Boom" generation to receive a Social Security check.[1] As more of the oldest Boomers reach that milestone, many will begin the process of retirement, some will encounter health problems, and most will contemplate what life will hold for them in the coming decades. How the Baby Boomers age, the choices they make, and the environment that policy makers and business create for them will be critical factors in the performance of the US and even world economy over the next 30 years.

As the United States made the transition from an agricultural to an industrialized economy in the late 19th and early 20th centuries, the nation's birthrate declined. This trend accelerated significantly during the difficult years of the Great Depression and then World War II. But for 20 years following World War II, the birthrate rebounded strongly (Exhibit 1.1). This "Baby Boom" produced one of the largest birth cohorts in US history. At nearly 79 million strong, it is 50 percent larger than the "Silent generation" that preceded it.[2]

Neither of the generations that have followed the Boomers—"Generation X" and the "Millennials"—have had birthrates as high. The Millennials (sometimes referred to as the "Boomer-echo," as they are the offspring of the Boomer generation) are slightly more numerous than the Boomers themselves. However, because the national population is much bigger now than when the Boomers

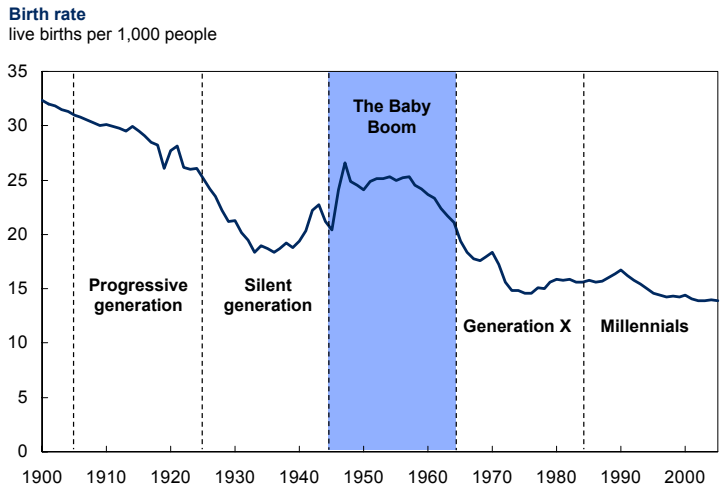
1 "Country's 1st baby boomer receives 1st Social Security payment," Associated Press, February 12, 2008. Ms. Casey-Kirschling was cited by the Social Security Administration as the first Baby Boomer eligible for Social Security.

2 See "Our Approach" later in this chapter for an explanation of how we define birth cohorts.

were born, the Millennials represent a smaller share. The Millennials represent just 27 percent of the total population today, while the Boomers accounted for 41 percent after their birth (Exhibit 1.2). This demographic bulge has made the Boomers the most economically important cohort in modern US history.

Exhibit 1.1

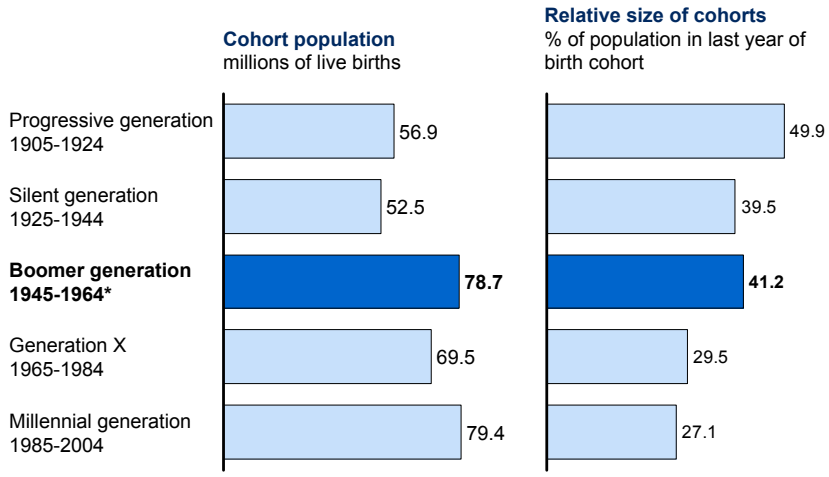
THE POSTWAR JUMP IN BIRTHRATE CREATED THE "BABY BOOM" GENERATION



Source: Historical Statistics of the United States; Vital Statistics of the United States; United States Census; McKinsey Global Institute Analysis

Exhibit 1.2

BOOMER COHORT IS LARGE IN BOTH ABSOLUTE AND RELATIVE TERMS



* Boomers are often defined by the birth years 1946-1964, although definitions vary. We use 1945-1964 to create standardized 20-year cohorts that can be compared across generations.

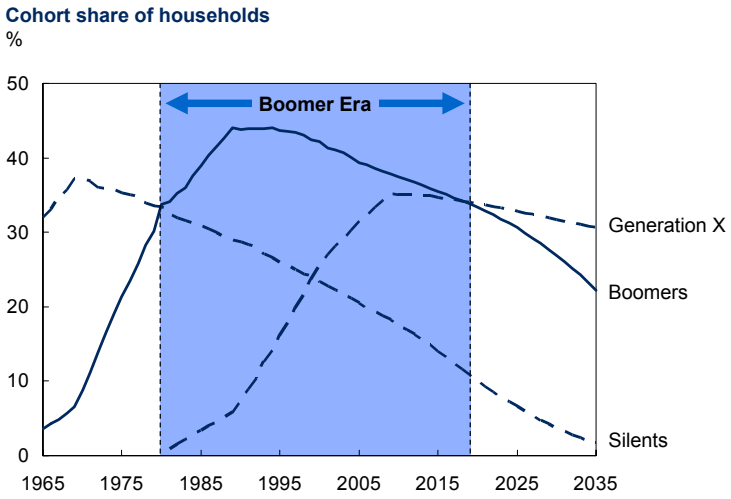
Source: Historical Statistics of the United States; Vital Statistics of the United States; United States Census

BOOMERS HAVE DOMINATED THE US ECONOMY

The Boomers have shaped the US economy over the past 40 years. One can think of the "Boomer era" as beginning in 1980 when the Boomers overtook the Silents as the largest group of households in the United States and extending until 2019 when Generation X will finally overtake the Boomers as a share of households (Exhibit 1.3).

Exhibit 1.3

THE SIZE OF THE COHORT HAS CREATED A "BOOMER ERA" FROM 1980 TO 2019



Source: McKinsey Global Institute US Consumer Model, v7.2

During this era, the Boomers have also dominated the United States socially and politically. This was the "Woodstock generation" that came of age in the 1960s, experienced Vietnam, Watergate, and the social and political divisions of that era. As this generation entered the workforce in the 1970s and '80s, married, formed households, and had children (not always in that order), the Boomers became the "Me generation" and began an unprecedented spending spree that continues today.

Over this period, women made dramatic gains in access to education and the job market. The nature of American households also changed substantially, with the Silents' typical family of 2 parents and 2.4 children fracturing into a greater variety of household sizes and family structures. In the 1990s as the Boomers began to enter their peak earning years, they rode the technology boom and a wave of rapid economic growth and asset appreciation. In 1992 the first Boomer president was elected. The Boomers took their place in the halls of power in

business and government and continue to influence the nation's cultural and social life, as seen in phenomena ranging from rock concert audiences full of fifty-somethings to the revival of religion in the United States.

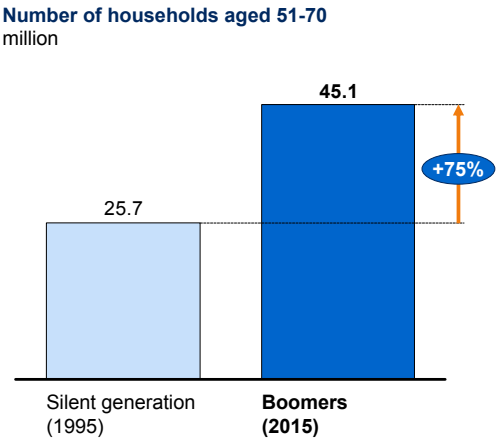
BOOMERS NOT "FADING AWAY" AS THEY AGE

This report will show that, unlike previous generations, whose influence slowly faded with age, the Boomers will continue to dominate the United States economically and in many other ways well into old age over the coming decades. Their earnings and spending may have just recently peaked, but the cohort's size ensures that Boomers will not be surpassed in their share of earning power by Generation X until 2016 and that they will maintain control of US households' net worth over the next two decades.

The size of the Boomer cohort means that as they age, so too will the US population—the US median age was 34.2 in 1995 and will be 37.4 in 2015. In 1995 there were nearly 26 million Silent generation households aged 51 to 70. By 2015, there will be 45 million Boomer households of the same age—a 75 percent increase in the number of older households during a 20-year period (Exhibit 1.4).

Exhibit 1.4

BOOMERS' AGING WILL DRIVE A 75 PERCENT INCREASE IN HOUSEHOLDS OVER 50



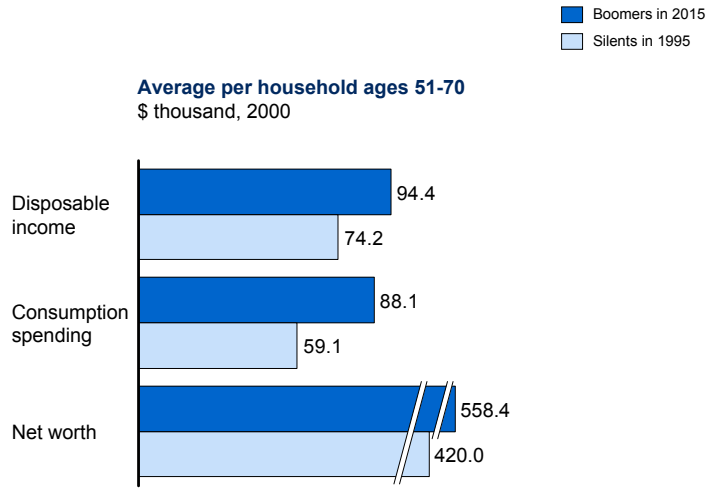
Source: McKinsey Global Institute US Consumer Model, v7.2

The Boomers' continued dominance of the economy as they age will not be because of their numbers alone. Throughout much of its lifetime, this cohort has

benefited from rapid economic growth, as well as other factors we will discuss in the next chapter, to become the richest generation in US history. We project that as the Boomers head into retirement, their average real household income will reach $94,400 in 2015 versus $74,200 for the Silents at the same point in their lives (Exhibit 1.5).[3] The Boomers have consistently been big spenders, and we expect them to continue spending at levels nearly 50 percent higher than their predecessors as they age.

Exhibit 1.5

BOOMERS ARE RICHER THAN PREVIOUS GENERATIONS



Source: McKinsey Global Institute US Consumer Model, v7.2

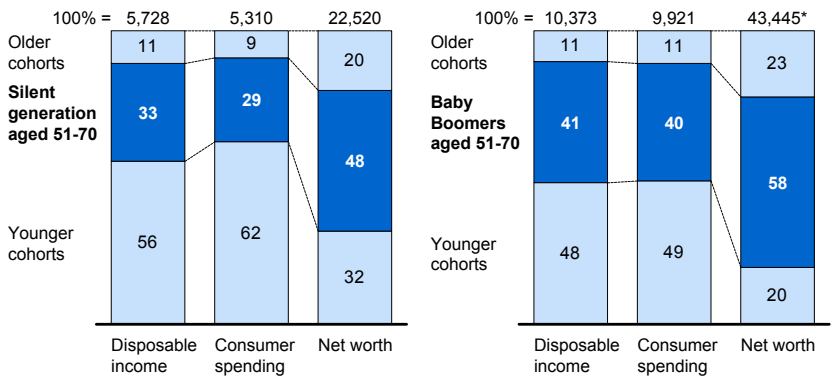
This combination of size and wealth means that the Boomers will dominate an unprecedented share of the US economy into their sunset years. When the previous Silent generation was aged 51 to 70 in 1995, it accounted for 33 percent of US disposable income (Exhibit 1.6). When the Boomers reach the same age group in 2015, we project they will generate 41 percent of disposable income. As they age, the Boomers will also account for substantially larger shares of consumption and net worth than their predecessors did. By 2010, for the first time ever, most US spending will be by people over age 50 (Exhibit 1.7). They will also control the most household disposable income and more than 80 percent of net worth.

3 See "A Note on How We Report Results and Other Model Factors" later in this chapter for an explanation of how we define household income.

Exhibit 1.6

AGING BOOMERS WILL DOMINATE ECONOMY MUCH MORE THAN PREDECESSORS…

$ billion, 2000; %

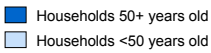


* Some figures do not sum to 100 due to rounding

Source: McKinsey Global Institute US Consumer Model, v7.2

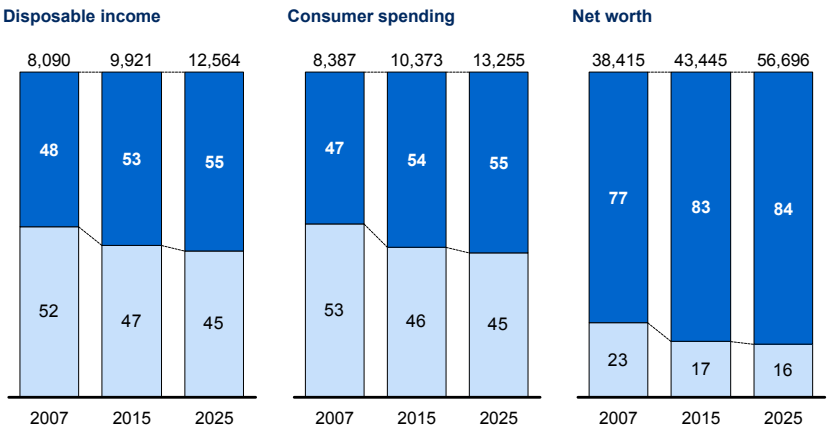
Exhibit 1.7

... AND DRIVE IMPORTANCE OF 50+ AGE GROUP TO AN ALL-TIME HIGH FOR NEXT 2 DECADES



Total share of economy by cohorts

$ billion, 2000; %



Source: McKinsey Global Institute US Consumer Model, v7.2

HOW READY ARE THE BOOMERS? HOW READY ARE GOVERNMENT AND BUSINESS?

But underneath these impressive figures of Boomer wealth lies another story. Boomers have behaved very differently than previous generations in terms of spending and saving. Many of the average and aggregate figures are held up by an extremely wealthy top-tier while middle-class and lower-income Boomer households will face significant financial stresses as they age. As this report will show, there are justified concerns about how well prepared both Boomers and the nation are for this generation's aging and retirement. At the same time, we see reasons for optimism about the Boomers' abilities to meet the challenges.

In earlier work, we focused on what this demographic transition portends for businesses, how they can find rich new opportunities in serving aging consumers, and what challenges they might face.[4] This report takes a broader view of the Boomers' role in the economy. We lay out how they gained their historic economic clout and where they stand today financially. Furthermore, we show that Boomers' decisions on how much to spend, how much to save, whether to continue working in coming years, and what to do with their stock portfolios and their houses will have a major impact on the US economy for the next two decades. Finally, we discuss some key questions facing the policy makers and business leaders who must cope with the ongoing demographic transition.

In short, this report will focus on three critical questions about the future of the Boomers:

1. **How will Baby Boomers' finances evolve as they age and retire?**—What has driven Boomer earnings, spending, and savings over the years? How will Boomer finances evolve over the next two decades, and how will that evolution be different for high-, middle-, and low-income households?
2. **How prepared are Boomers for retirement?**—How adequate are Boomer savings? How many Boomers face a lifestyle drop in retirement? How will the spending and saving of aging Boomers affect the overall US economy?
3. **What can be done to improve Boomers' financial prospects in old age?**—Will Boomers need to stay in the workforce longer than they had planned? Will they want to? Will there be jobs for them? Would a late burst of savings make a significant difference? How can business and government help Boomers continue to work and save?

4 David Court, Diana Farrell and John E. Forsyth, "Serving Aging Baby Boomers," *The McKinsey Quarterly*, November 2007.

Several areas of concern about this demographic transition are the subject of much discussion. Chief among them is whether the nation's Medicare and Social Security systems will be adequately funded to support the Boomers as they age. As this topic is well covered elsewhere, we will not examine it directly.[5] Instead, we will focus on aspects of Medicare, Social Security, and current policies that have a direct influence on Boomers' decisions to work and save as they enter their retirement years.

OUR APPROACH

To answer these questions, we utilized two methodologies. First we assembled a database of US household economic information from 1962 through the third quarter of 2007 that combines macroeconomic and household survey data, including detailed information on incomes by source and consumption by product and service category, as well as household net worth split by class of asset and liability. This database of economic information is cut by age group and income class. We then built an econometric forecasting model to project household income, spending, and net worth through 2035 when the youngest Boomer is 71 years old. This econometric model is fully integrated with a complete macroeconomic forecast for the United States provided to us by Oxford Economics.[6] This combination enables us to look at how income, consumption, and net worth will likely evolve for the Boomers and other cohorts. It also takes into account the sensitivities of those projections to changes in the economy and to potential shifts in policy. A detailed description of the dataset and model can be found in Appendix B.

Second, we were interested not just in the Boomers' economics, but also in their attitudes, outlook, and behaviors. We wanted to know whether their beliefs about their financial circumstances matched the reality, and we wanted to know their attitudes toward retirement. In addition, we wanted to learn what their intentions were for earning, spending, and saving over the coming years. Thus, in partnership with McKinsey's Consumer Insight Practice, we conducted a survey of 5,100 households between 50 and 70 years old, complemented by in-depth ethnographic home interviews with 32 households approaching or just past retirement.[7]

5 See, for example, presentations by the GAO comptroller general, www.gao.gov/cghome.htm

6 We use Oxford's 10-year forecast completed in October 2007 as a starting point for our baseline forecast. The Oxford outlook is largely maintained, although we have implemented some changes that reflect MGI's point of view on how the economy is likely to evolve both in the short and long term. Beyond 2017, MGI has developed a long-term forecast that extends the predictions from the Oxford model. This is based upon our view of demographic trends, and the growth in potential output for the US economy. See Appendix A for further details.

7 Further information on detailed results of the survey and the implications for companies is also available to McKinsey clients through the Firm's Consumer Insight Practice.

Counting cohorts

The division of a population into birth cohorts is by nature arbitrary, and there is no set standard for cohort birth years or cohort labels. However, the labels we use— "Silent generation," "Baby Boomers," and "Generation X"—are the most commonly used terms for the generations born between 1925 and 1985. Baby Boomers are typically defined by the birth years 1946–64, although definitions vary. We define Baby Boomers as those born from 1945 through 1964 to create standardized 20-year cohorts that can be compared across all generations. Generation Xers were born from 1965 through 1984; the Millennials from 1985 through 2004. We also frequently distinguish between the "early" members of each cohort who were born in the first 10 years, and the "late" members who were born in the subsequent decade. Thus, Early Boomers were born from 1945 through 1954; the Late Boomers were born from 1955 through 1964.

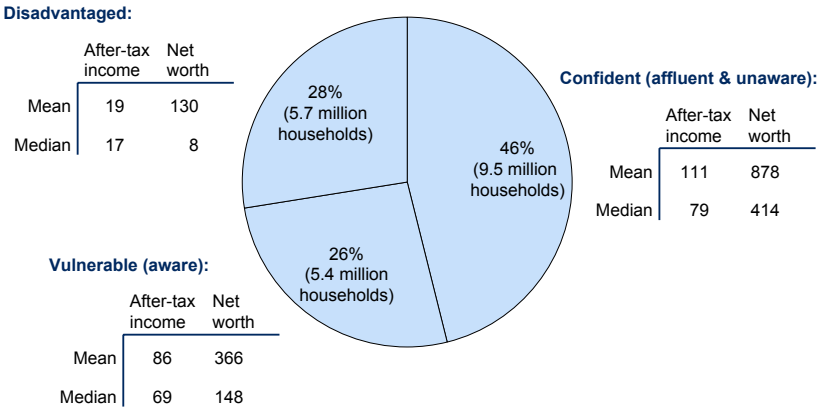
Three groups of Boomers

In our survey work we found that the Boomers expressed a rich variety of attitudes, but could be divided into three distinct attitudinal groups: the confident, the vulnerable, and the disadvantaged (Exhibit 1.8).[8] These groups broadly correlated with the economic condition of the households in them but had a number of specific characteristics:

Exhibit 1.8

BOOMERS FALL INTO THREE ATTITUDINAL GROUPS

Distribution of Early Boomer household by attitudes, 2006
100% = 20.6 million households; $ thousand, 2000



Note: Boomers aged 50-61 when surveyed used as a proxy for total Boomer cohort.
Source: McKinsey Global Institute US Consumer Model, v7.2; US Aging Consumer Survey, 2007

8 The groupings are based on a cluster analysis of attitudinal statements and economic criteria that identify low-income groups.

- **Confident**—This group accounts for almost half of Boomer households, and they believe they are well-prepared financially for the future. This is the richest, healthiest, best educated, most married, and most optimistic group. However, there are two types of confident households that share similar attitudes and aspirations but have different financial means. The "affluent confidents" have the wherewithal to fulfill their aspirations, while the "unaware confidents" share these aspirations but do not have the resources to meet them.

- **Vulnerable**—This group accounts for a little more than a quarter of the total. These households have lower income than the confidents and less than half the net worth. They also tend to have lower education levels and a lower likelihood of being married. The vulnerable households have worries about their finances, their health, and the danger of loneliness in retirement. Many are frustrated with their lives and pessimistic about the future, and they do not believe they can count on family or the government to bail them out.

- **Disadvantaged**—A little more than a quarter of Boomer households falls into the disadvantaged category. These Boomers have had low incomes throughout their lives, are the least educated, the least likely to be married, and have the poorest health. They are typically financially unprepared for retirement and worry about the affordability of health care.

While much has been written about the aging of the Boomers, we believe that our work is distinctive from previous analyses in three ways. First, we capture a complete picture of Boomer household finances (income, consumption, and net worth) over their entire lifecycle and project it forward in a way that is linked to an overall macroeconomic scenario. Second, we look at the distributional effects of the evolution of Boomer finances, since averages and aggregates do not tell the whole story. And third, our survey gives us insights into how the Boomers are thinking about their situation. In the coming chapters we will see how Boomer economics and attitudes combine to paint a picture of how Boomers will likely behave in the coming decades.

One of the most striking findings of our survey is that most Boomers are very upbeat about life and open to change. Nearly nine out of ten (86 percent) say they have always believed they deserve a good life. Nearly eight out of ten (78 percent) believe they can control their own destiny and survive anything life throws them. Already, 40 percent say they are ready to "change my life as I age."

A NOTE ON HOW WE REPORT RESULTS AND OTHER MODEL FACTORS

Appendix A provides an overview of our baseline macroeconomic forecast as well as the macroeconomic scenarios we use to test changes in Boomer behavior. Appendix B provides an overview of how we constructed our historical database, as well as the structure of our econometric model. However, it is important for interpreting the results in our report to briefly note a few points.

When we finished our projections in October 2007, we had complete annual macroeconomic information through 2006. Results presented for 2007 and beyond are estimates and forecasts.

Our econometric model captures 100 percent of household income and spending in the economy. Following national accounting standards, we include income and spending provided in-kind to households. For example, the largest in-kind adjustment is for medical expenditures: health insurance benefits and expenditures paid for by employers and government are included in household income and expenditures.[9] Thus, we capture out-of-pocket spending by households, as well as spending that occurs on their behalf. Similarly, we capture income received directly by households, and that spent on their behalf. We make appropriate adjustments to the household survey information to ensure that income and spending by age group, birth cohort, and income percentile are consistent with this benchmark. This means that our income figures may look higher than other figures readers may be accustomed to seeing (which capture only direct income and are not scaled to national accounts). It is also important to remember that incomes rise with age, so the figures for Boomer income may also appear high. For example, average Boomer household income in 2007 on an "all-in" basis was $95,510 versus a US average of $81,920.

Similarly, our econometric model captures 100 percent of household net worth. Estimates of assets and liabilities by age group, birth cohort, and income percentile are benchmarked to the national totals for internal consistency.

All of our income, spending, net worth, and overall economic data are reported in inflation-adjusted terms using year 2000 dollars as our base year.[10] Thus, unless otherwise noted, all figures are in real terms, making them higher in pre-2000

9 The national accounts also include nonprofit activity in the household sector, and special adjustments are made for housing. For an overview of national accounts methodology, see www.bea.gov/national/pdf/nipa_primer.pdf

10 We use chain-type price indices to adjust for inflation. For an overview, see Karl Whelan, "A Guide to the Use of Chain Aggregated NIPA Data." Mimeo. Federal Reserve Board of Governors (June 2000).

years and lower in post-2000 years than the equivalent nominal figures. For example 2007 nominal Boomer household income of $95,510 drops to $81,360 in real terms, and average US household income of $81,920 drops to $69,780.

Finally, the majority of our results are reported on a per household basis rather than per capita, as households are the most relevant unit of analysis for understanding the economic impact of the Boomers. We use the Census Bureau's count of US households. By Census's definition, a household includes all the persons who occupy a housing unit, and the age of the household is that of the head of household. In 2006, there were nearly 79 million individual Boomers, while there were approximately 45 million Boomer households. Thus per household numbers tend to appear higher than per capita numbers: The 2007 Boomer average household income of $95,510 drops to $54,404 on a per capita basis.

ORGANIZATION OF THIS REPORT

The remainder of this report is organized into four more chapters:

- Chapter 2, *What a Long, Strange Trip It's Been*, will describe the Boomers' economic journey and the factors that have enabled them to enjoy among the highest levels of income growth in US history.

- Chapter 3, *Money Can't Buy Me Love*, will ask why, despite such strong income growth, have the Boomers failed to save at the level of previous generations? What are the national consequences of this decision?

- Chapter 4, *You Can't Always Get What You Want*, will assess the Boomers' current readiness for retirement and show why so many are poorly prepared.

- Chapter 5, *Stairway to Heaven*, will show that the Boomers could brighten their financial future significantly by saving more, and that the best way for them to boost their savings is by working longer than previous generations. This would benefit both individual households and the broader economy. Lastly, we will look at the ways policy makers and business leaders can help the Boomers work longer and save more, fostering a better outcome for all.

2. What a Long, Strange Trip It's Been

As people go through their lives, they experience what economists call an "earnings life cycle."[1] Typically, earnings are lowest when an individual is young and first enters the workforce. They rise as the worker accumulates skills, experience, and seniority, and they peak at or near retirement. Finally, earnings fall off sharply in the latter years of life. People use credit and savings to smooth consumption over their lifetime—borrowing in the early years to fund education, buy a house, pay expenses associated with starting a family, and so on. Then they pay down debt during their peak earning years and accumulate savings for retirement. Finally, as their income drops after retirement, they draw down savings.

Over this chapter and the next, we will examine how the Baby Boomers have behaved over their economic life cycle. How has their pattern been similar to or different than that of previous generations, and what has driven the differences? Given that the Boomers are only partway through their life-cycle trajectory (the oldest Boomers are 63 and the youngest are 44), we will project how that life cycle is likely to play out over the coming two decades. We will start with Boomer earnings in this chapter, and then move on to their consumption and savings in the next chapter.

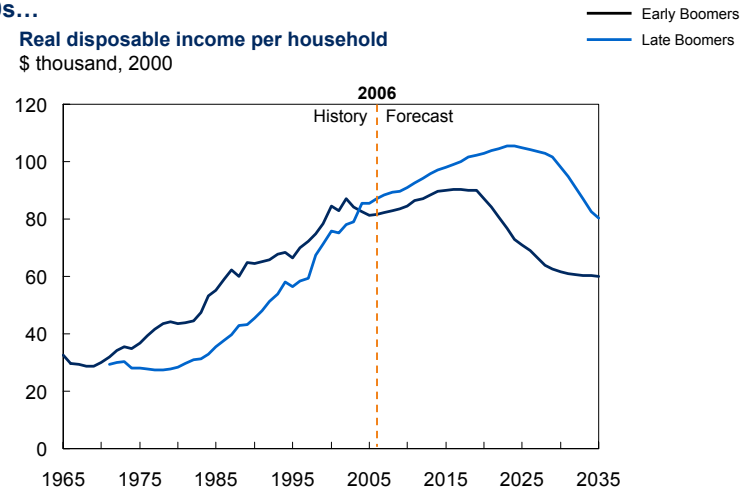
1 The Life Cycle Theory of Earnings was proposed in the early 1950s by Franco Modigliani and his student Richard Brumberg; for his work, Modigliani won the 1985 Nobel Prize in economics. See Franco Modigliani and Richard H. Brumberg, "Utility analysis and the consumption function: an interpretation of cross-section data," in Kenneth K. Kurihara, ed., Post-Keynesian Economics (New Brunswick, NJ: Rutgers University Press, 1954), pp. 388–436.

THE HIGHEST-EARNING GENERATION

The Boomers entered the workforce and began their path up the earnings life cycle during the two decades between 1965 and 1985 (Exhibit 2.1). The Early Boomers, born from 1945 through 1954, are now largely in their fifties and in their high-earning years. They currently have an average annual real household disposable income of approximately $82,000, which we project will rise to a peak of $90,000 by around 2015. The Late Boomers, born from 1955 through 1964, are now largely in their forties and in the midst of their earnings rise. They have already passed the income levels of their older peers, and we project their disposable income will peak around 2025 at $106,000.[2]

Exhibit 2.1

BOOMERS HAVE BEEN IN THEIR PRIME INCOME GROWTH YEARS SINCE THE 1980s…



Age (midpoint)	Early Boomers	35	55	75
	Late Boomers	25	45	65

Source: McKinsey Global Institute US Consumer Model, v7.2

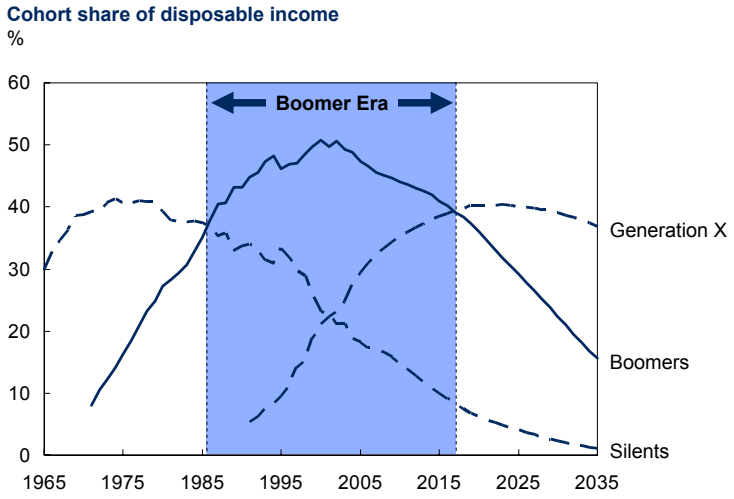
The combination of the size of the Boomer cohort and its rising earnings trajectory means that the Boomers have been the dominant earners in the United States since 1986 and will continue to be until 2019 (Exhibit 2.2).

Compared with their forebears, the Silent generation (born 1925-44), the Boomers have earned more in real terms per household at every age across the life cycle. In Exhibit 2.3, we show life-cycle earnings broken into four 10-year cohorts, and we can see that by their early thirties, the Boomers were outpacing

2 See Chapter 1 for a brief description on how we measure income, and Appendix B for further details.

Exhibit 2.2

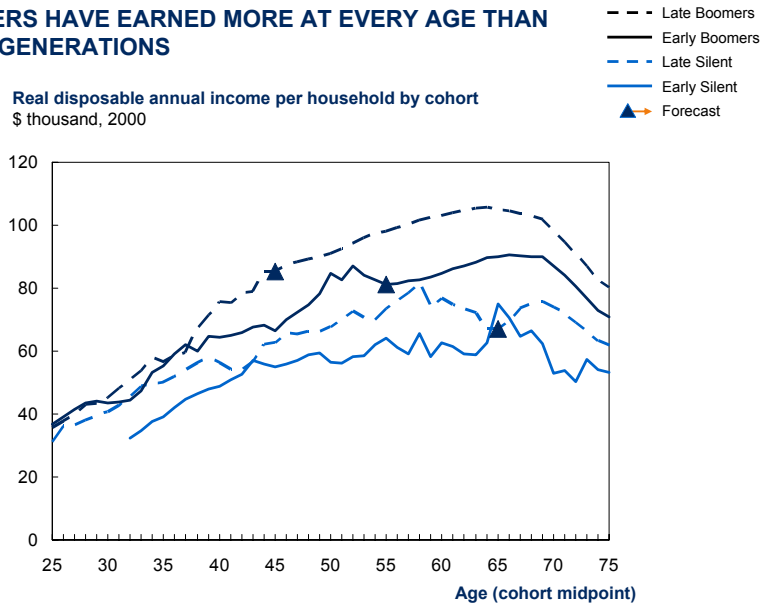
…AND WILL CONTINUE TO CONTROL THE LARGEST SHARE OF INCOME UNTIL 2019



Source: McKinsey Global Institute US Consumer Model, v7.2

Exhibit 2.3

BOOMERS HAVE EARNED MORE AT EVERY AGE THAN PRIOR GENERATIONS



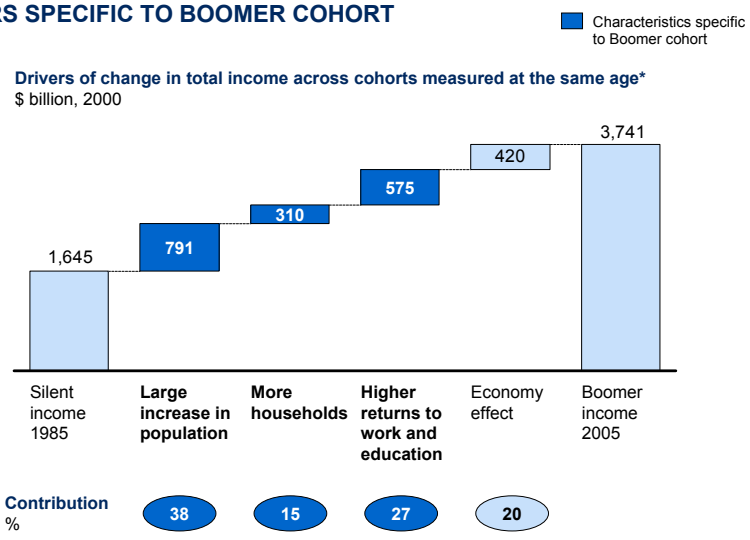
Source: McKinsey Global Institute US Consumer Model, v7.2

their Silent predecessors. We project they will continue to do so into their fifties and sixties. We also expect Boomer earnings to peak somewhat later than those of the Silent generation, a topic to which we will return.

To understand the Boomers' impact on income creation, we switch from looking at income per household to comparing aggregate income across cohorts. Doing so we find that the Boomers collectively have earned more than twice as much as the Silents at the same age—$3.7 trillion versus the Silents' $1.6 trillion (Exhibit 2.4). There are four factors that explain this difference in income creation: the large size of the Boomer cohort; the fall in Boomer household size, which has led to more Boomer households and thus more earners; higher returns to education and work; and the overall economy.[3]

Exhibit 2.4

EIGHTY PERCENT OF BOOMER INCOME GROWTH DUE TO ONETIME FACTORS SPECIFIC TO BOOMER COHORT



* Decomposition compares 10-year cohorts at the same age: Early Boomers vs. Early Silents at age 55; Late Boomers vs. Late Silents at age 45. Age refers to cohort midpoint.

Source: McKinsey Global Institute US Consumer Model, v7.2

The first three of these factors are specific to the Boomers and account for 80 percent of the total change in income. We believe these three are not likely to be repeated because subsequent cohorts, although large in numbers, are smaller as a share of the population; and because the fall in household size, and gains in rates of educational attainment and labor force participation have largely topped out. The fourth factor, the economy's performance, benefitted all cohorts.

3 See the Appendix B for a description of how these effects were disaggregated.

More Boomers

First, the most obvious reason that Boomers have generated more income is that there are more of them—44.6 million Boomer households versus 26.7 million Silent households. If we assume that on average the Boomers have lived with the same number of adults and the same income per household as the Silent generation that preceded them, the simple fact that there were more of them would account for $791 billion, or 38 percent, of their greater aggregate income compared with the Silents at the same age (see Exhibit 2.4).

Fragmenting households

The Boomers also earned more because they have lived very differently than the Silents. One key difference was that Boomer women poured into the workplace at rising rates, further boosting the size of the labor force. This change was closely linked to a set of social trends: The Boomers have married and had children later in life, have divorced at higher rates, or have chosen not to marry at all. As a result, the Boomers are now divided into a larger number of smaller households, with fewer adults per household, than previous generations. And for the Boomers, more households have meant more earners. Again assuming that Boomers had the same average income as the Silents, this shift provides a second explanation for the Boomers' greater collective income, accounting for $310 billion, or 15 percent, of the difference (see Exhibit 2.4).

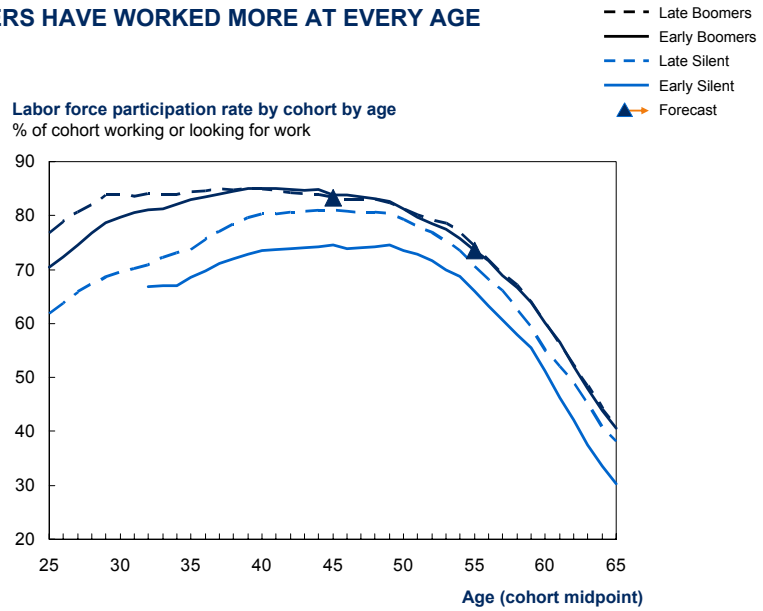
The Boomers have participated in the labor market at higher rates than their Silent predecessors at every age (Exhibit 2.5). The combination of the Boomers' numbers and higher participation has led to a sharp rise in labor force participation for the country as a whole over the past three decades (Exhibit 2.6). This raised the economy's productive capacity, spurring GDP growth to higher levels than what otherwise would have been attainable.

All of this increase in labor force participation reflected the entry of women into the US workforce in significant numbers in the 1970s through 1990s (Exhibit 2.7). Female labor force participation rose from 39 percent in 1965 to 58 percent in 2005, more than offsetting the decline in the male labor force participation rate from 77 percent to 72 percent.

As women made gains in the job market, the structure of the average US household was changing. The Early Silents' household size peaked at an average of 4.5 people in 1965, when they were around age 35. In contrast, the Boomers' household size peaked later in their lives, when they were around age 45, and reached an average of just 3.3 people per household. While household fragmentation

Exhibit 2.5

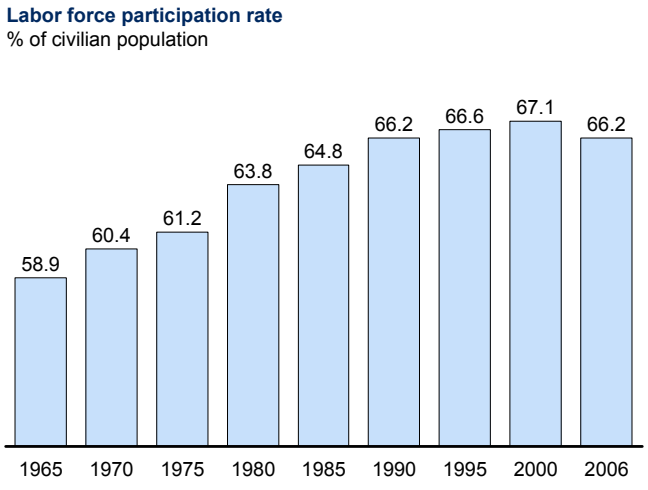
BOOMERS HAVE WORKED MORE AT EVERY AGE



Source: McKinsey Global Institute US Consumer Model, v7.2

Exhibit 2.6

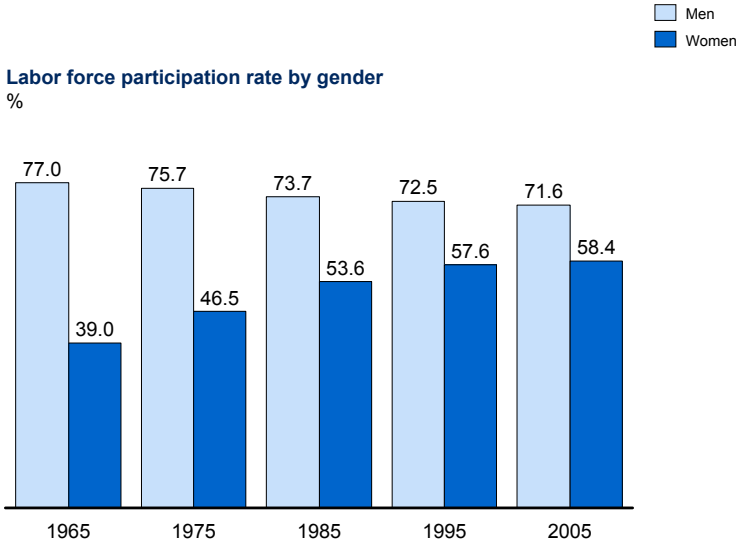
LABOR FORCE PARTICIPATION RATE ROSE FROM 1965 TO 2000



Source: Bureau of Labor Statistics

Exhibit 2.7

INCREASE IN LABOR FORCE PARTICIPATION DRIVEN BY THE ENTRY OF WOMEN



Source: Bureau of Labor Statistics

boosts aggregate income by creating more earners, it lowers average household income. If, for example, we take a four-person household with one earner making $50,000 per year, then split it into two households with one person still making $50,000 per year and a second person now entering the labor force and earning $30,000 per year, aggregate income has risen from $50,000 to $80,000 but average household income has dropped from $50,000 to $40,000.

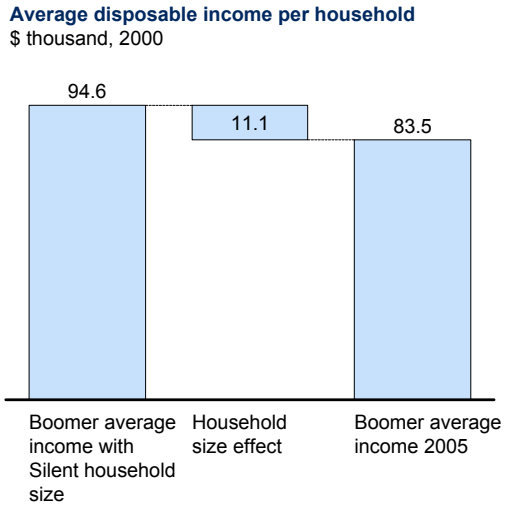
Likewise, if we split a two-earner household with one person earning $50,000 and one $30,000 into two households, the aggregate is the same, but the average per household drops from $80,000 to $40,000.

In the case of the Boomers, their smaller household sizes depressed average earnings by $11,000 compared with the Silents (Exhibit 2.8). Thus the fact that average Boomer household earnings are higher than the Silents at every age is *despite* their smaller household size.

The fragmentation of US households has reflected other social trends. Both male and female Boomers married later than their predecessors—the average age of first marriage for women rose from 20.3 in 1950 to 25.5 in 2006, and for men from 22.8 to 27.5 (Exhibit 2.9). By age 30, approximately 90 percent of Silent generation women had married, versus 80 percent of Boomer women.

Exhibit 2.8

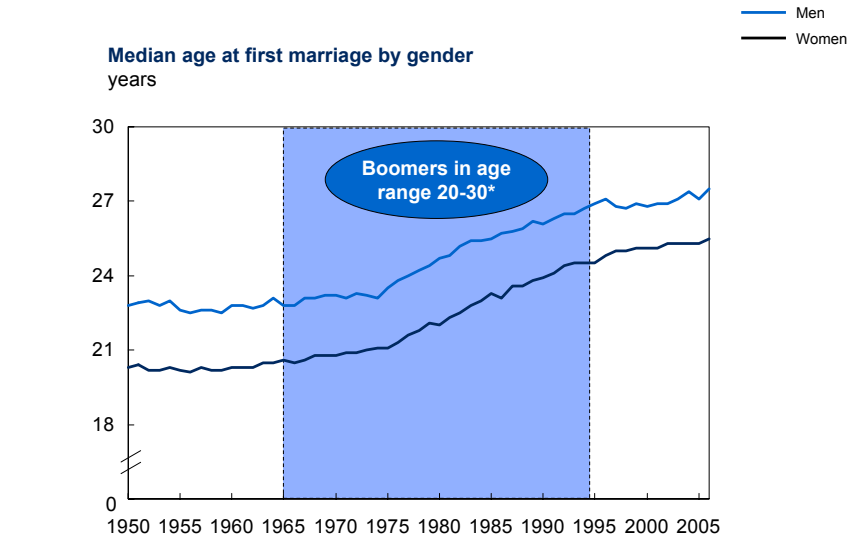
HOUSEHOLD FRAGMENTATION CREATES MORE HOUSEHOLDS AND LOWERS INCOME PER HOUSEHOLD



Source: McKinsey Global Institute US Consumer Model, v7.2

Exhibit 2.9

BOOMERS HAVE BEEN MARRYING LATER



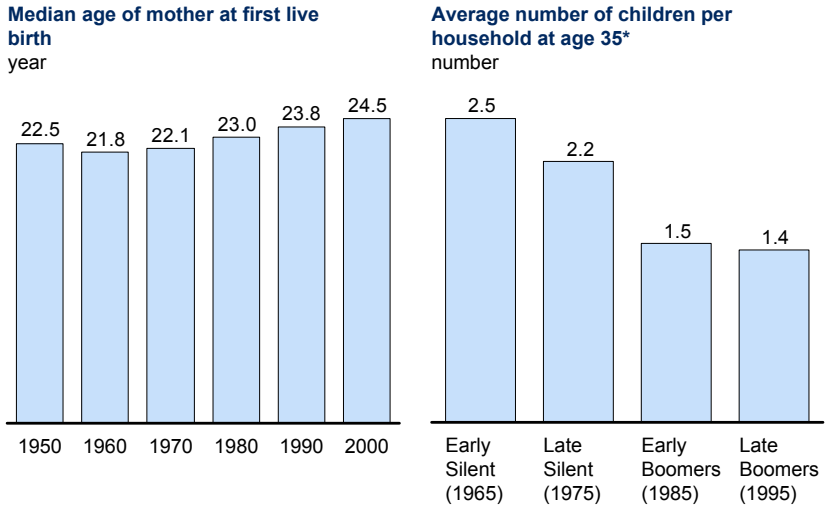
* Oldest Early Boomer is 20 in 1965 and youngest Late Boomer is 30 in 1994.

Source: Current Population Survey

The Boomers also had children later in life, and had fewer of them. The median age of the mother at her first live birth rose from 22.5 in 1950 to 24.5 in 2000. And while the typical early Silent household had 2.5 children by age 35, the Late Boomers had just 1.4 (Exhibit 2.10).

Exhibit 2.10

WITH LATER MARRIAGE, BOOMER HOUSEHOLDS HAD CHILDREN LATER IN LIFE AND FEWER OF THEM



* Age refers to cohort midpoint.

Source: McKinsey Global Institute US Consumer Model, v7.2; Centers for Disease Control and Prevention

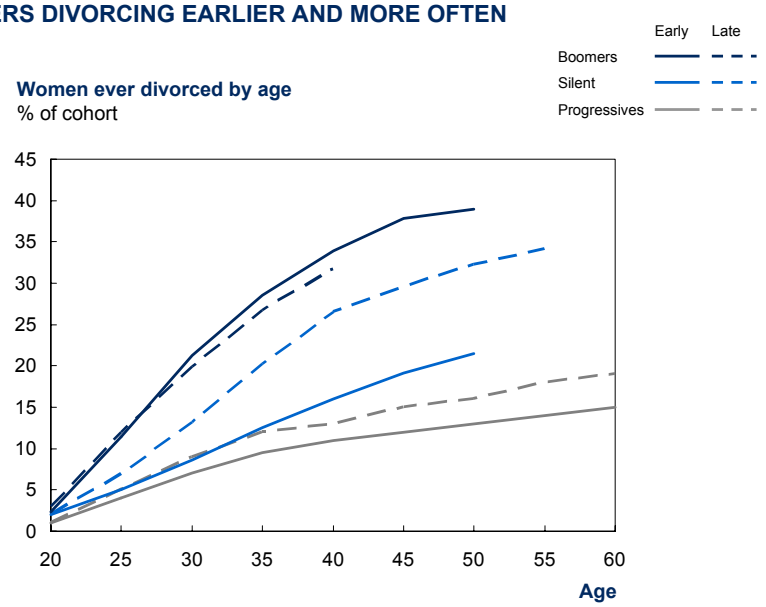
The Boomers divorced more, and at an earlier age. Indeed, at every age, Boomers were more likely to be divorced than previous generations. More than a third (35 percent) of Early Boomer women were divorced by age 40. That's more than double the 15 percent share of Early Silent women who were divorced at the same age (Exhibit 2.11). Many divorced Boomers remarried. By age 40, approximately 23 percent of Early Boomer women had been married two times or more, compared with only 12 percent of Early Silent women.[4] For earlier generations, remarriage more often followed the death of a spouse, rather than divorce.

The net impact of these trends was more households, smaller households, and a change in the composition of households. When the Early Silents were aged 35 through 43, the vast majority (83 percent) lived in a "traditional" household with a spouse. By the time the Late Boomers were this age, this share had dropped to 65 percent (Exhibit 2.12). Over the same period, single-person or single-parent

4 See US Census Bureau, "Number, Timing, and Duration of Marriages and Divorces: 1996," and the same report for 2001. Both reports are based upon the Survey of Income and Program Participation.

Exhibit 2.11

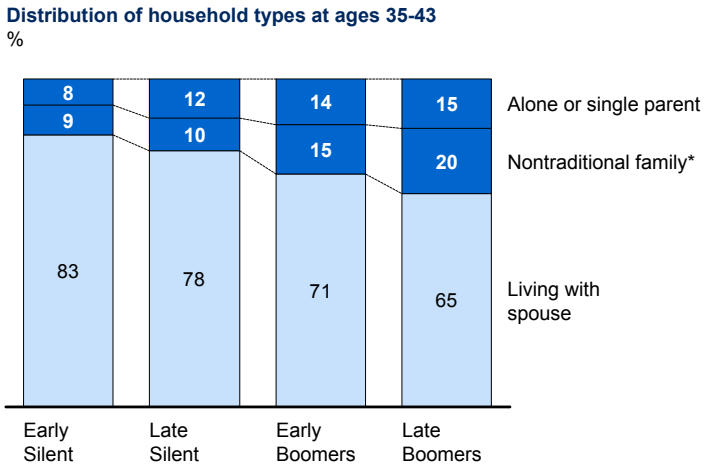
BOOMERS DIVORCING EARLIER AND MORE OFTEN



Source: Survey of Income and Program Participation, 1986, 1996, 2001

Exhibit 2.12

MORE BOOMERS LIVING ALONE OR IN NONTRADITIONAL HOUSEHOLDS



* Nontraditional family with children and others including relatives and nonrelatives.

Source: The American People; Census 2000

households almost doubled from 8 to 15 percent, and likewise "nontraditional" households (e.g., nonmarried couples with children) more than doubled from 9 to 20 percent. Thus by the time the younger Boomers hit ages 35–43, more than a third of them were living outside traditional households.

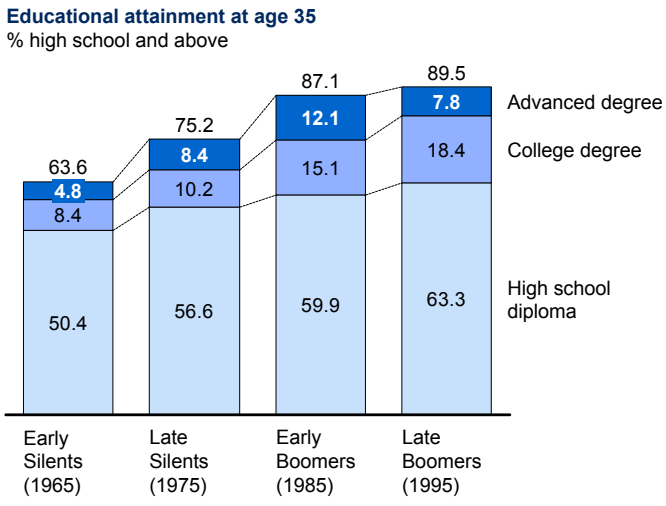
Greater returns to education and work

Third, the Boomers have enjoyed greater returns to both education and work than the previous generation, which increased their average household income. They became more educated than previous generations, in large part because of the educational gains by Boomer women. And they did so at a time when the labor force was shifting from industrial work to service and knowledge jobs, increasing the returns to education. They were also better able than other cohorts to capitalize on changes in the economy stemming from productivity growth, technological innovation, and globalization during this period. We estimate that higher returns boosted aggregate income by $575 billion, or 27 percent (see Exhibit 2.4).

Here, we see some of the same social trends that drove shifts in the structure of US households have also had a dramatic impact on the US labor force during the Boomer era. The Boomers became more educated—89.5 percent of Late Boomers had attained at least a high school diploma, versus 63.6 percent of Early Silents. Likewise, 26.2 percent of Late Boomers had a college or advanced degree by age 35—double the 13.2 percent share for Early Silents (Exhibit 2.13).

Exhibit 2.13

BOOMERS HAVE HIGHER LEVELS OF EDUCATION ATTAINMENT THAN PREVIOUS COHORTS



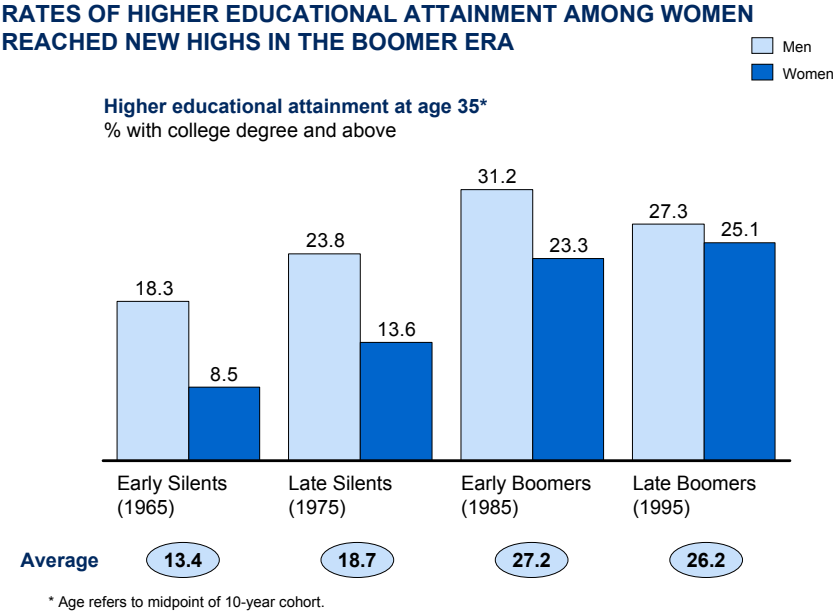
Source: Current Population Survey; McKinsey Global Institute Analysis

These broad gains reflected postwar trends. Prior to World War II, the vast majority of Americans stopped their formal education during their secondary years—only 15 percent graduated from high school and only 5 percent from college. After the war, high school graduation rates rose significantly as diplomas became the Silent generation's entry ticket into the workforce. Enrollments in college and advanced degree programs also rose with the GI Bill and increased government funding for higher education, particularly in science and technology—the so-called Sputnik effect of Cold War competition with the Soviet Union. Draft deferments during the Korean and Vietnam wars also provided a strong incentive for men in the Late Silent and Early Baby Boom generations to stay in college and seek advanced degrees.

Then in the 1970s and 1980s, there was a dramatic shift. Women surged into college and advanced degree programs, tripling their level of educational attainment between that of the Early Silents in 1965 and that of the Late Boomers in 1995 (Exhibit 2.14). But during this same period, male educational attainment peaked with the Early Boomers in the mid-1980s and fell with the Late Boomers in the 1990s. The drop-off was concentrated in advance degree programs. The men's level has since risen again slightly with Generation X.

Exhibit 2.14

RATES OF HIGHER EDUCATIONAL ATTAINMENT AMONG WOMEN REACHED NEW HIGHS IN THE BOOMER ERA



* Age refers to midpoint of 10-year cohort.
Source: Current Population Survey; McKinsey Global Institute Analysis

Several factors were at work during this shift. Increased female enrollments in higher education were encouraged by changing social attitudes toward women,

antidiscrimination legislation like Title VII and Title IX, and a sharp jump in the financial returns to women—or wage premium—from earning degrees, starting in the late 1960s.[5]

Meanwhile men's college graduation rates declined after the end of the draft in 1973. Men showed less enthusiasm for graduate school when the marginal economic returns to advanced degrees slumped from 1970 to 1980. And while the government boosted the enrollments of Early Boomers through the GI Bill and other subsidies, public funding of education did not increase in proportion to the size of the Boomer cohort. Colleges and graduate schools did not expand their capacity enough to absorb all the Boomers, resulting in some crowding out. And as male and female participation rates equalized (they are roughly equal today), male participation dropped.

The "Goldilocks" economy

Fourth, and finally, the remaining 20 percent of the Boomers' income gains is due to a factor not specific to the Boomers—the overall economy. This is the gain they received by benefitting from economic growth at least as much as did everyone else over this period.

The Boomers have had the good fortune of living through an era of particularly strong economic performance. Although the Early Boomers suffered through the "stagflation" of the 1970s and a recession in the early 1980s, they were generally in their twenties and thus at the low point on their life-cycle curve. They then entered the steep part of their earnings curve in what some commentators have called the "Goldilocks" ("not too hot, not too cold") economy of the 1980s and 1990s, with real GDP growth above 3 percent per year, low inflation, moderate interest rates, and low unemployment (Exhibit 2.15). Likewise, the Late Boomers entered the workforce during this period and then saw their incomes rise rapidly.

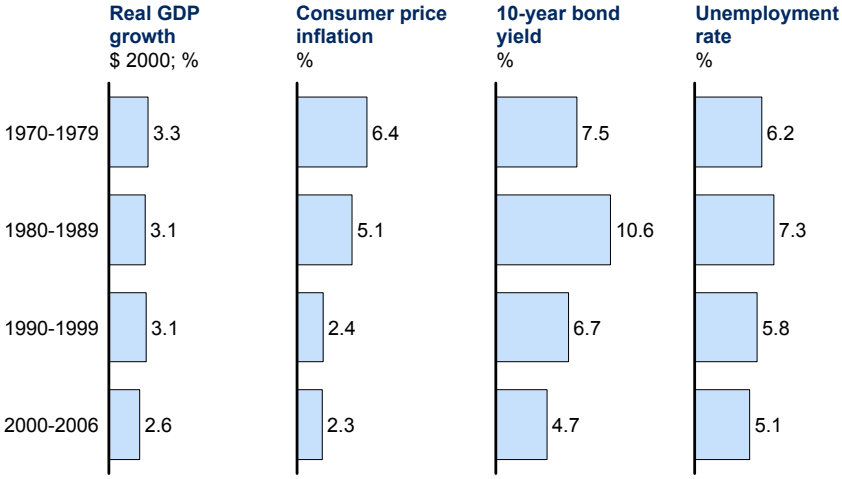
Complementing the overall strong macroeconomic environment was a dramatic shift in the job market. When the earliest Boomers entered the workforce, 35 percent of the nation's jobs were in goods-producing industries, such as manufacturing, construction, and mining (Exhibit 2.16). By 2005, that share was down to 17 percent, and 66 percent of jobs were in the service and knowledge sectors of the economy. Government jobs remained roughly constant through this period

5 Claudia Goldin, Lawrence F. Katz, and Ilyana Kuziemko, "The Homecoming of American College Women: The Reversal of the College Gender Gap," *Journal of Economic Perspectives*, vol. 20, no. 4 (Fall 2006), pp. 133-156.

Exhibit 2.15

ECONOMIC PERFORMANCE HAS BEEN VERY STRONG DURING THE BOOMER ERA

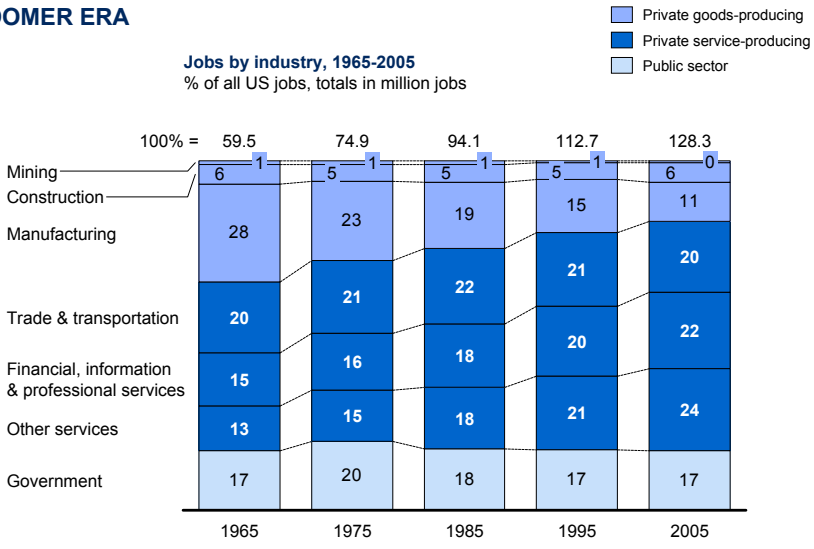
Average annual values



Source: Bureau of Economic Analysis; Bureau of Labor Statistics; Federal Reserve

Exhibit 2.16

SERVICE AND KNOWLEDGE JOBS GREW DRAMATICALLY DURING THE BOOMER ERA



Note: Figures may not sum due to rounding.

Source: Bureau of Labor Statistics; Current Employment Statistics; Establishment Data

at 17 percent. The dramatic growth in service and knowledge sector jobs tended to push overall income levels up and, in particular, reward those with higher levels of education.

The combination of a strong economy and changing labor market lifted incomes generally and benefited the Boomers particularly (see Exhibit 2.4).

• • •

After sorting through these shifts, we see that onetime factors specific to the Boomers accounted for a full 80 percent of their $2 trillion increase in aggregate earnings over the amount earned by the Silent generation (see Exhibit 2.4). Nearly 40 percent of the increase was attributable simply to the size of the Boomer cohort, while the remaining 40 percent was caused by social changes related to household structures and the role of women in society, and to the increased returns to education and work. Only 20 percent of the increase was because of long-term economic trends not specific to the Boomer cohort, such as higher productivity and technological change.

Looking ahead, there is another large cohort working its way through the US population—the Millennials, who as children of the Boomers are sometimes known as the "Boomer echo." Their cohort size will also increase aggregate income—though not in the same proportion to the overall economy as the Boomers. The significant boost to incomes from the increased education of women and their entry into the workforce was a onetime event. Indeed, both female educational attainment and labor force participation rates appear to have stabilized in recent years. As we will see in later chapters, this will present some challenges for continuing the greater than 3 percent annual pace of real growth the US economy saw from 1970 to 2000.

RICH BUT UNEQUAL

Thus far we have focused on explaining the high aggregate and average incomes that Boomer households have enjoyed. In this section we will look at how those gains have accrued disproportionately to Boomers in the upper-income brackets.

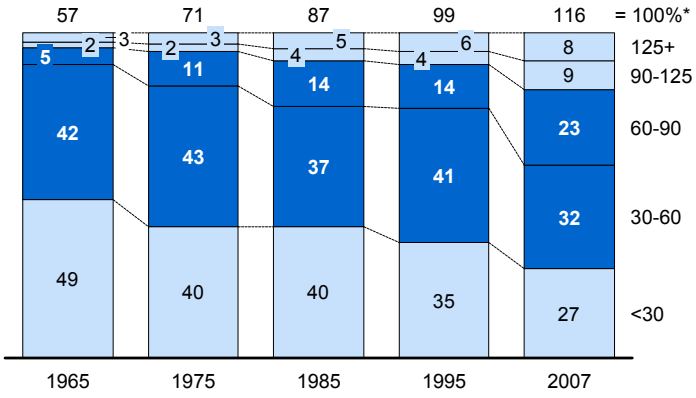
Looked at by percentage of households at different income brackets, the middle of the income distribution has been roughly stable over the past 30 years (Exhibit 2.17). In 1975, 54 percent of households had real disposable annual income between $30,000 and $90,000; in 2007, the share was 55 percent. As incomes have risen overall, the share of households earning less than $30,000 a year has

shrunk from 40 percent to 27 percent, while the portion at the top earning above $90,000 has risen from 5 percent to 17 percent.

Exhibit 2.17

NUMBER OF MIDDLE-INCOME HOUSEHOLDS HAS BEEN STABLE SINCE 1975

Distribution of disposable income
millions of households; %; income brackets $ thousand, 2000



* Figures do not sum to 100 due to rounding.
Source: McKinsey Global Institute US Consumer Model, v7.2

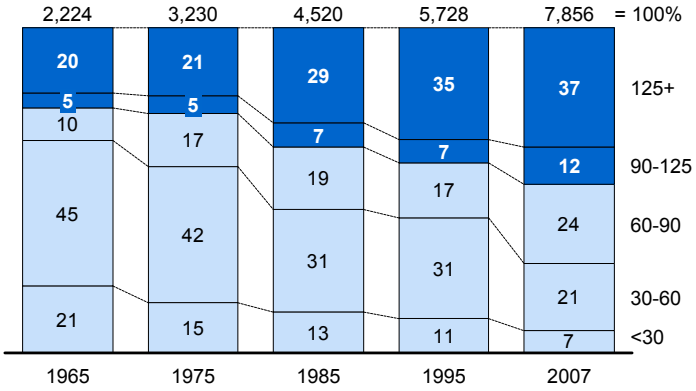
Meanwhile, the top bracket's share of income has climbed significantly (Exhibit 2.18). In 1975, households earning more than $90,000 captured 26 percent of all disposable income, while by 2007 those upper brackets took home 49 percent. More than half of these households are headed by Boomers. As the top has garnered a greater share of income, inequality has grown. When the Late Silents were aged 41–50 in 1975, the top 5 percent of households by income in that age cohort earned 6.8 times the amount earned by the middle 20 percent. By the time the Late Boomers reached the same age in 2005, the ratio of top to middle had grown to 11 (Exhibit 2.19).

An interesting question is how much of the rise in US income inequality since the 1970s is attributable to the Boomers specifically versus the impact of other cohorts. We see two ways in which the Boomers have increased inequality. The first is simply their size, which amplifies the impact of the life-cycle shape to earnings described above (see Exhibit 2.3). As a cohort moves into its peak earning years, its average incomes will be higher than those of cohorts that are at the beginning or end of their life cycle. Thus, these peak earners will drive up overall inequality in the economy. Given the size of the Baby Boom generation, this effect was particularly pronounced (i.e., for a period there are more unequal 45-year-olds than equal 25-year-olds).

Exhibit 2.18

UPPER-INCOME HOUSEHOLDS HAVE GARNERED AN INCREASING SHARE OF DISPOSABLE INCOME

Income shares by disposable income bracket
$ billion 2000; %; income brackets, $ thousand 2000

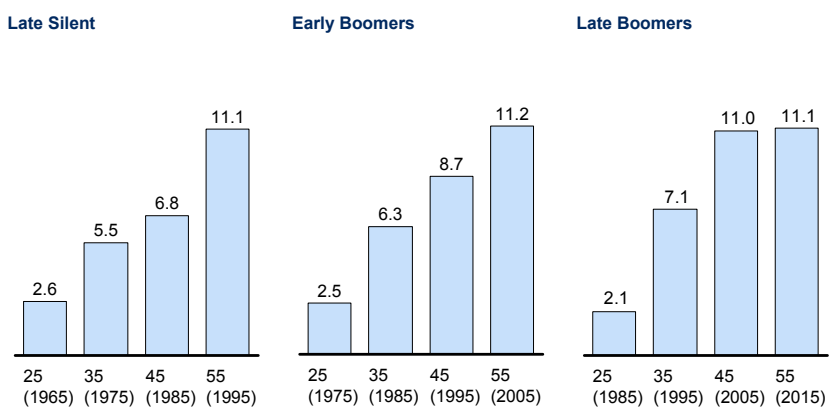


Note: Figures may not sum due to rounding
Source: McKinsey Global Institute US Consumer Model, v7.2

Exhibit 2.19

RECENT COHORTS HAVE SEEN INEQUALITY RISE EARLIER IN THEIR LIFE CYCLE THAN PRIOR COHORTS BUT ENDED UP IN THE SAME PLACE

Ratio of average disposable income for top 5% to middle 20%*
Ratio



* Centered 5-year averages (e.g. 1995 is 1993-1997).
Source: McKinsey Global Institute US Consumer Model, v7.2

The second effect is that inequality rises *within* a cohort during the life cycle. The reason is fairly intuitive—when a generation first enters the labor market, everyone's incomes are relatively low and thus inequality within the cohort is also fairly low. But as people age and progress in their careers, their income paths diverge. The manual laborers' incomes grow little if at all over time, while the hedge fund managers' incomes take off. For example, when the Early Boomers were age 25, the top 5 percent of earners earned 2.5 times the amount earned by the middle 20 percent. By the time they reached age 45, the ratio had increased to 8.7 (see Exhibit 2.19).

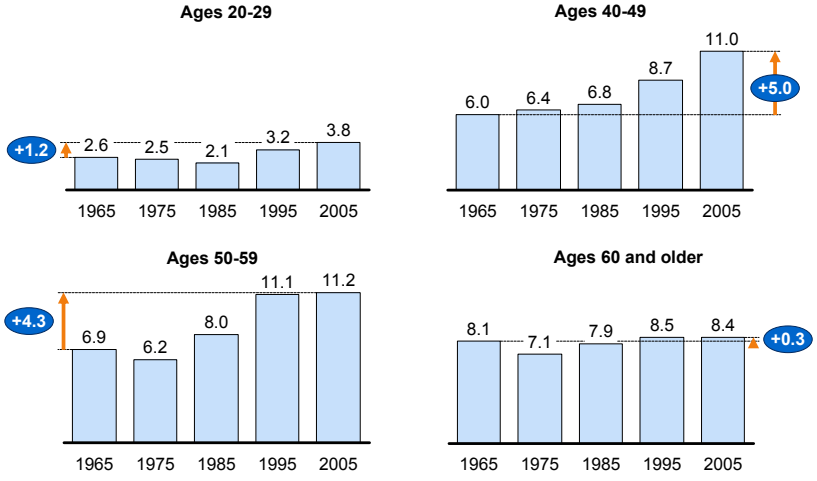
Again, this effect was particularly pronounced for the Boomers, who had higher income inequality during their peak earning years. We see this through changes in the shape of the inequality-life-cycle curve. As Exhibit 2.19 shows, cohorts tend to start and end at roughly the same levels of inequality, but with the Boomers there has been an increase in inequality during the middle years. Over the past 30 years, inequality among 40- to 49-year-olds and 50- to 59-year-olds has risen significantly, while it has been relatively stable among the young (ages 20–29) and the old (ages 60-plus) (Exhibit 2.20). Potential explanations for this include greater returns to education, technological change, the increased prevalence of pay for performance, the decline of unions, and globalization.[6]

Exhibit 2.20

THE INCREASE IN INEQUALITY HAS BEEN CONCENTRATED IN THE MIDDLE OF THE AGE DISTRIBUTION OCCUPIED BY BOOMERS

Ratio of average disposable income for top 5% to middle 20%*

Ratio



* Centered 5-year averages (e.g. 1995 is 1993-1997).

Source: McKinsey Global Institute US Consumer Model, v7.2

6 For example see Thomas Lemieux, "The Changing Nature of Wage Inequality," NBER Working Paper Series, 13523 (October 2007), p. 40.

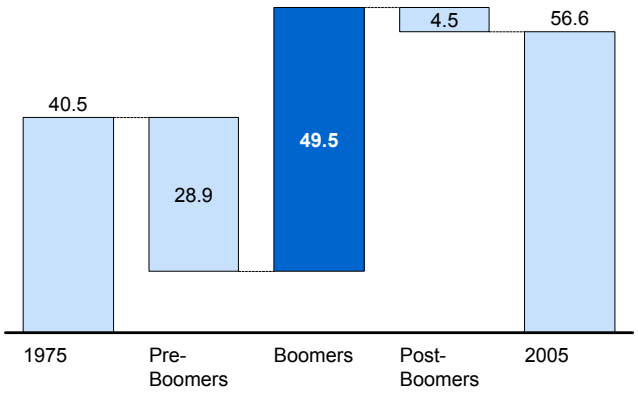
Combining these two effects—the size of the Boomer cohort and the greater inequality growth within the cohort—we estimate that the overall increase in inequality in the US between 1975 and 2005 was in large part driven by the Boomers (Exhibit 2.21). Using a measure of inequality known as the Theil index, we can decompose the impact of different cohorts on inequality and what is driving inequality within each cohort.[7] The generations prior to and after the Boomers have had an inequality-decreasing effect over this period. Inequality among the older generation, the Silents, was falling as they moved into the later years of their life cycle, while inequality among Generation X, the younger generation, had not yet begun to rise, driving average inequality down. The combination of a large cohort riding up the life-cycle curve, plus increased income dispersion within the Boomers' curve, has put significant upward pressure on inequality over the decade (Exhibit 2.22).

• • •

Exhibit 2.21

BOOMERS ARE THE LARGEST CONTRIBUTORS TO INCREASED INEQUALITY OVER LAST 30 YEARS

Contributions to changes in Theil index of inequality, 1975-2005
Theil units*



* Theil index is a measure of inequality that is zero for perfect equality, and log (Population) for perfect inequality.
Source: McKinsey Global Institute US Consumer Model, v7.2

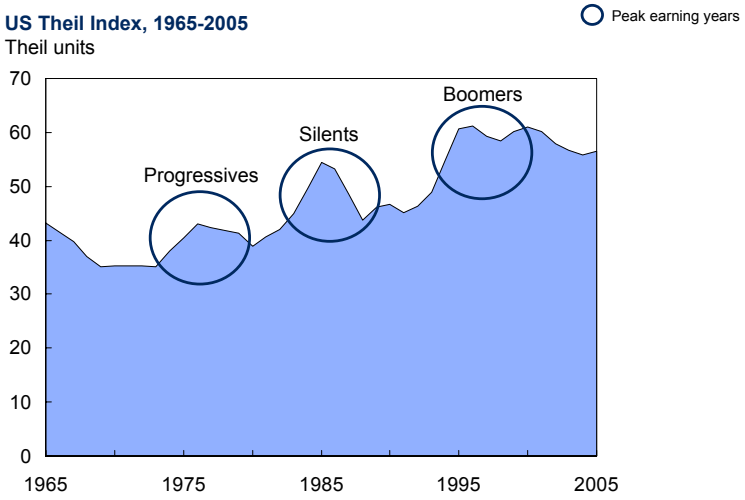
The Boomer journey has thus been one of historically rapid increases in real income through their lifetime. This has been partly because of a healthy economic environment during their primer working years, but primarily because of the size of the Boomer labor force, an increased number of earning households,

7 See Appendix B for an explanation of the Theil index.

and greater returns to education and work. Income gains have been unequal, however, and the inequality within the Boomer cohort has driven the overall increases in inequality over the past decade.

Exhibit 2.22

UNLIKE EARLIER "SPIKES" IN INEQUALITY IN THE '70s AND '80s, INCOME INEQUALITY HAS STABILIZED AT A HIGH LEVEL SINCE THE MID-1990s



Source: McKinsey Global Institute US Consumer Model, v7.2

ECONOMICS REFLECTED IN ATTITUDES

As the Boomers age, some of these same social and economic trends are having an impact on Boomer attitudes and views of the future. The fragmentation of Boomer households, for example, has left many of them worried about their situation as they age. Our survey found that three out of four vulnerable Boomers said that one of their greatest fears was that they would end up alone. And indeed two-thirds of the vulnerable said they were single, nearly double the proportion of our other two groups, the confident and the disadvantaged. Likewise, slightly more than half the disadvantaged also said they feared ending up alone. Only the confident, 69 percent of whom are married, seem to escape that fear (only a quarter worry about it).

The Boomers' income inequality also has created a gap in their attitudes toward life as they approach retirement. Overall, 72 percent of Boomers say they are very satisfied with their lives. The confident Boomers, who are also the richest, are the most content—88 percent described themselves as very satisfied. In contrast, only 56 percent of the vulnerable and 59 percent of the disadvantaged said the same.

Likewise, a majority of the vulnerables (64 percent) and disadvantaged (58 percent) say they are very frustrated that they are not living the life they expected as they approach retirement. This is more than twice the rate of frustration expressed by the confidents, just 25 percent of whom feel that way.

We see a similar divide in the Boomers' attitudes toward the future. Nine in ten of the confident Boomers say they are excited about all they have to look forward to. But fewer than two out of three vulnerable Boomers (62 percent) and disadvantaged Boomers (65 percent) share that excitement. Worse, nearly one in three vulnerables (31 percent) say they often find themselves very angry about aging. And one of four disadvantaged Boomers share that anger. In contrast, just one in ten confident Boomers says the same.

• • •

Indeed, this strong sense of frustration and anxiety felt by the vulnerable and disadvantaged Boomers—who constitute more than half of Boomer households—is not without reason. As we will see in the next chapter, the dispersion in Boomer earnings has led to wide differences in the state of Boomer household finances.

3. Money Can't Buy Me Love

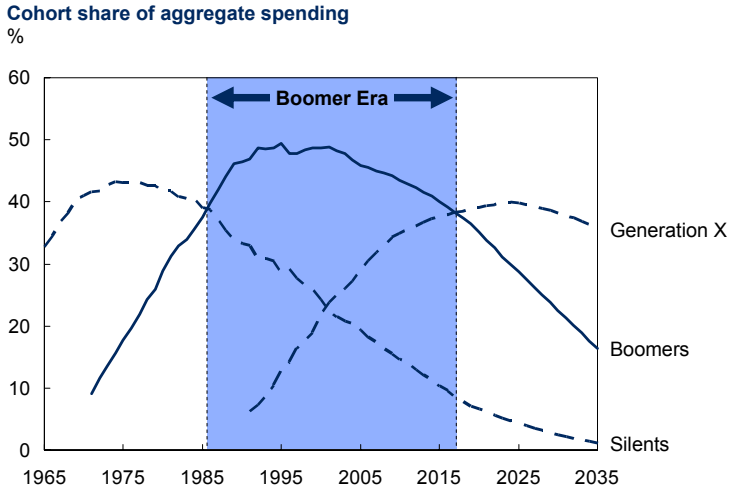
While the Baby Boomers have earned record amounts, they have also spent record sums. At every age, they have collectively spent more than previous generations. Of course, this is not surprising, given their strong income growth and the good economic times they've lived through. But their purchasing patterns also reflect choices made along the way that have had far-reaching effects. For example, their enthusiastic embrace of new technologies fueled the personal computer and dot-com booms, while their search for the latest therapies helped spur significant rises in medical spending, and their adoption of new investment and credit products helped dramatically expand the financial services industry and rack up record levels of household debt. In recent years, Boomer spending has been a primary driver of national economic growth, the expansion of new consumer markets, and the decline in the national saving rate. The Boomers collectively amassed great wealth as they rode the stock and real estate booms of the past decade, but their gains have been uneven. And the busts that followed have left many individual Boomers heavily indebted and uncertain about their financial future.

BOOMERS AS CONSUMERS

Boomers began to emerge as a significant spending force in the latter half of the 1970s, as the Early Boomers entered the workforce. By the 1980s, the Early Boomers were building their households, while the Late Boomers were graduating from college and going to work. By 1986, Boomers were 21 to 41 years old and collectively accounted for a larger share of consumer spending than any other generation in the country (Exhibit 3.1). By the early 1990s, the Boomers accounted for nearly half of all US consumer spending.

Exhibit 3.1

BOOMERS HAVE BEEN THE DOMINANT SPENDERS FOR TWO DECADES



Source: McKinsey Global Institute US Consumer Model, v7.2

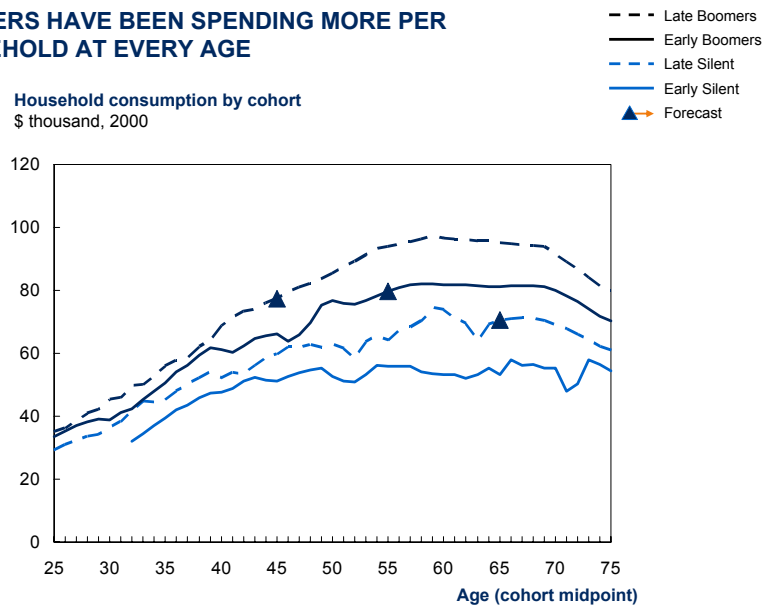
Following their life-cycle income gains (see Exhibit 2.3), the Boomers have also spent more in real terms per household than their Silent predecessors at every age. By the time the Boomers were in their middle thirties, their spending was outpacing that of the Silents, and we project they will continue to do so into their fifties and sixties and on into their retirement years (Exhibit 3.2). Boomers' share of spending has peaked over the past decade as the Late Boomers have reached the apex of their earnings life cycle while the Early Boomers' increases are slowing. Nevertheless, the Boomers will continue to maintain the largest share of spending across cohorts through 2015. Because of this trend, 2010 will mark the first time in US history that households headed by individuals aged 50 or more will control more than half of US spending. The Boomers will account for 80 percent of the 50-plus total.

Increases in Boomer spending are driven largely by factors specific to their cohort

Once again, we switch from our per household view to a view of total activity by cohort to compare the Boomers' impact relative to that of the Silents and to understand the forces driving the underlying differences. We find that the Boomers not only earned more than twice as much as the Silents, but they spent more than twice as much as well—$3.5 trillion versus the Silents' $1.5 trillion (Exhibit 3.3).

Exhibit 3.2

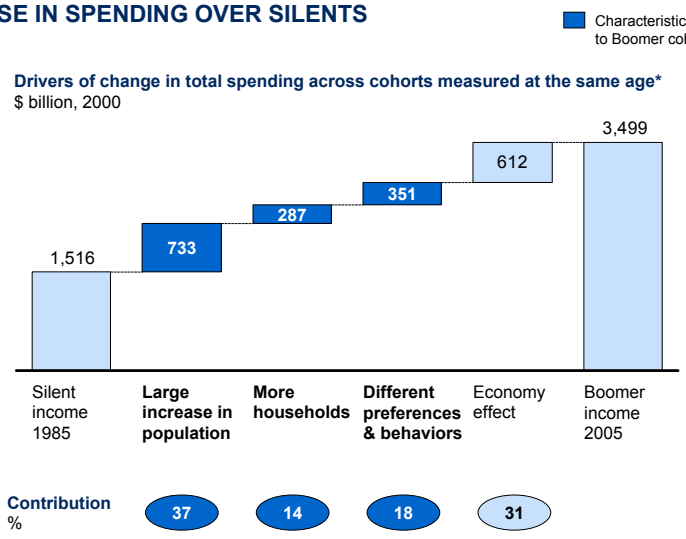
BOOMERS HAVE BEEN SPENDING MORE PER HOUSEHOLD AT EVERY AGE



Source: McKinsey Global Institute US Consumer Model, v7.2

Exhibit 3.3

BOOMER-SPECIFIC CHOICES DROVE NEARLY ONE-THIRD OF THEIR INCREASE IN SPENDING OVER SILENTS



* Decomposition compares 10 year cohorts at the same age: Early Boomers vs. Early Silents at age 55; Late Boomers vs. Late Silents at age 45. Age refers to cohort midpoint.

Source: McKinsey Global Institute US Consumer Model, v7.2

In this case (holding spending per household and household size at the level of the Silents), we find that Boomers' population numbers account for 37 percent of the difference between their spending and the lower level of the Silent generation at the same ages. An additional 14 percent of the generation's extra spending was driven by the decrease in household size and concomitant increases in the number of households. The greater number of adults living alone rather than as couples means each one needs a home, furniture, dishes, appliances, phone line, and so on. They spend more apart than they would by sharing resources. But nearly a third (32 percent) of the difference reflects the Boomers' personal choices, spending preferences, and social trends. Thus, 70 percent of Boomers' elevated spending is accounted for by onetime factors specific to their cohort.

Finally, 31 percent of the Boomers' extra spending is explained by the strong economic growth that has helped boost incomes, stock prices, and home values during their prime years—enabling them and all other cohorts to consume more.

Boomers have spent their money differently, altering spending patterns in the economy

The Boomers also spend their money differently than previous generations, channeling more into personal electronics, recreation, and health care.[1] For example, today Boomers account for nearly half of all consumer electronics spending in the country, snapping up the latest computers, software, cell phones, digital cameras, music systems, and other items. When the Early Boomers were aged 35 to 45, consumer electronics spending accounted for 8 percent of the total growth in their spending. When the Late Boomers were the same age, their spending on consumer electronics accounted for 10 percent of their spending growth. This compares with 3 percent for the Early Silents and 4 percent for the Late Silents at the same age (Exhibit 3.4).

We see the same pattern with health care spending, including purchases of medical services, drugs, and health insurance. When the Early Boomers were aged 35–45, their consumption of these goods and services accounted for 18 percent of their spending growth; for Late Boomers at the same age, it accounted for 16 percent. That compares with 13 percent for the Early Silents and 10 percent for the Late Silents.

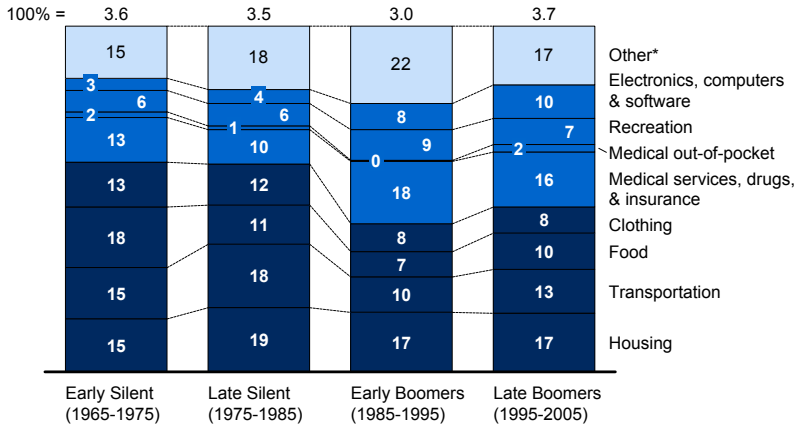
The impact of Boomer spending patterns has been large enough to move the national trends in the same direction. Consumer purchases of electronics and health care have become bigger drivers of national spending growth. Electronics

1 For definitions of consumption categories, see Appendix A.

Exhibit 3.4

RESULTING IN VERY DIFFERENT PATTERNS OF BOOMER SPENDING GROWTH VERSUS PREDECESSORS

Contributions to total spending growth by category, ages 35-45
10-year CAGR; %



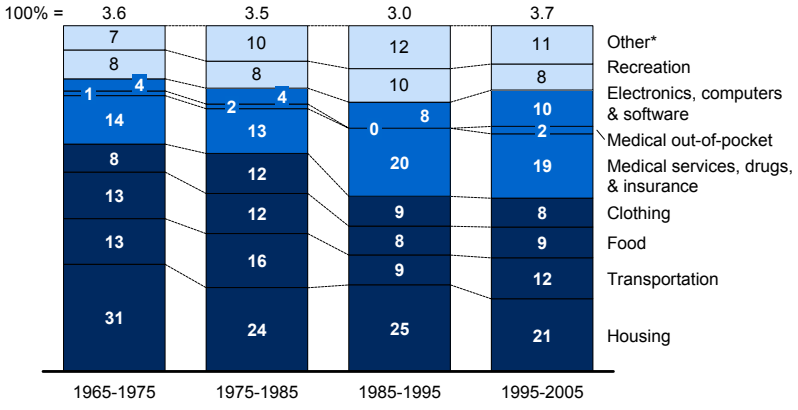
* Other includes education, charity and welfare, personal business and personal goods spending.
Note: Age refers to cohort midpoint. Figures may not sum due to rounding.
Source: McKinsey Global Institute US Consumer Model, v7.2

spending, for example, accounted for 10 percent of total spending growth from 1995 through 2005, up from 8 percent in the previous decade and 4 percent in each of the two decades before that (Exhibit 3.5).

Exhibit 3.5

US SPENDING GROWTH HAS BEEN SHIFTING TOWARD MEDICAL AND HIGH TECH

Contributions to total spending growth by category
10-year CAGR; %



* Other includes education, charity and welfare, personal business and personal goods spending.
Note: Figures may not sum due to rounding
Source: McKinsey Global Institute US Consumer Model, v7.2

Similarly, over time, health care spending has become the largest source of real consumer spending growth, accounting now for more than 20 percent of overall increases in personal consumption. Nearly all of this spending is covered by private and public insurance programs. Consumer out-of-pocket spending on health care has dropped from 52 percent of total medical spending in 1965 to 15 percent in 2005, according to the Centers for Medicaid and Medicare Services. Thus, "out-of-pocket" medical spending has contributed very little to overall consumer spending growth.

Boomer spending patterns have also reflected broader social changes. For example, as women increasingly worked outside the home, Americans started eating out more and buying more take-out food prepared in restaurants, supermarkets, and fast-food establishments, driving the expansion of those markets. The Boomers' share of spending that goes to food prepared away from home is double the share of previous generations.

As the Boomers have led these shifts in spending over time, and as the nation has grown more affluent, we also see that spending on necessities such as housing, transportation, food, and clothing have become smaller drivers of overall consumer spending growth. Americans don't spend less on these goods and services, but their spending in these areas contributes less to consumption growth. These categories together accounted for 65 percent of the total consumer spending growth from 1965 through 1985, but just 50 percent since then.

THE MYSTERY OF THE MISSING PEAK

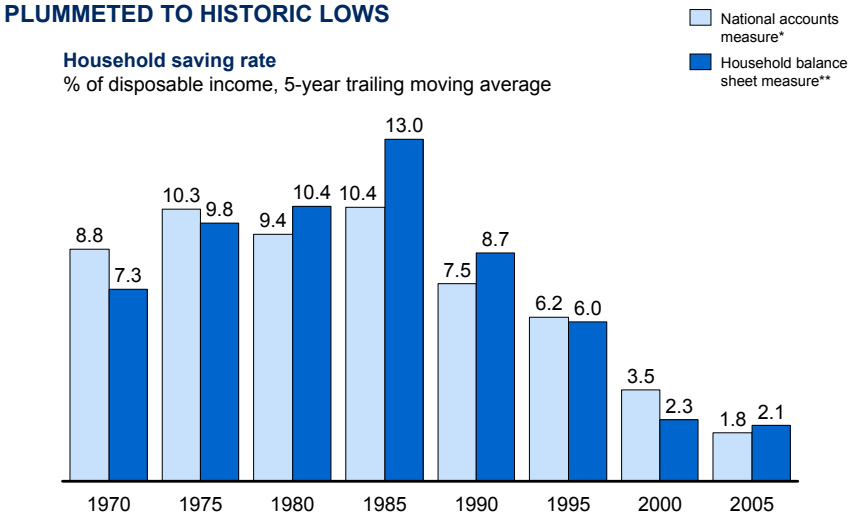
The Boomers' buying binge helped spur US economic growth through the last quarter of the 20th century, lifting living standards along the way. As the Boomers have aged, Americans bought ever-bigger houses, cars, and televisions; popped a proliferating variety of pills; and stocked up on ever-smarter cell phones and iPods. But the Boomers collectively were able to afford it all not by saving, as previous generations had, but by borrowing more heavily. This helped drive a steep decline in the national saving rate and an expansion of the US current account deficit—the broadest measure of the country's trade gap. The Boomers' spending and saving choices left the nation more indebted to overseas lenders and left many individual Boomers without the wealth they would need to maintain their living standards in retirement. These developments raise concerns over how Boomer households will finance their spending in the future, and whether recent consumer trends will continue.

Boomers' choices determined falloff of saving

The nation's household saving rate peaked at an average of more than 10 percent between 1980 and 1985, when the Silent generation was 41 to 60 years old, their prime earning and savings years. It has plummeted since then—during the Boomers' prime earning years—to a record low average of around 2 percent from 2000 through 2005 (Exhibit 3.6). Our analysis shows that a primary cause of this decline was the Boomers' departure from the path traced by earlier generations, who built up wealth by saving during their highest earning years and then drew down those resources in retirement. Our data show that the shape of this so-called life-cycle saving curve was remarkably consistent over the generations before the Boomers. Although the timing has differed, earlier generations always went through a clear phase of accumulating wealth, with the household saving rate peaking in the prime earning years. In contrast, the Boomers' collective saving rate did not peak during their prime earning years (Exhibit 3.7). Instead, their rate has leveled out since 1990 (Exhibit 3.8). This "missing peak" dragged down the national rate.

Exhibit 3.6

AS SPENDING HAS GROWN, THE HOUSEHOLD SAVING RATE HAS PLUMMETED TO HISTORIC LOWS

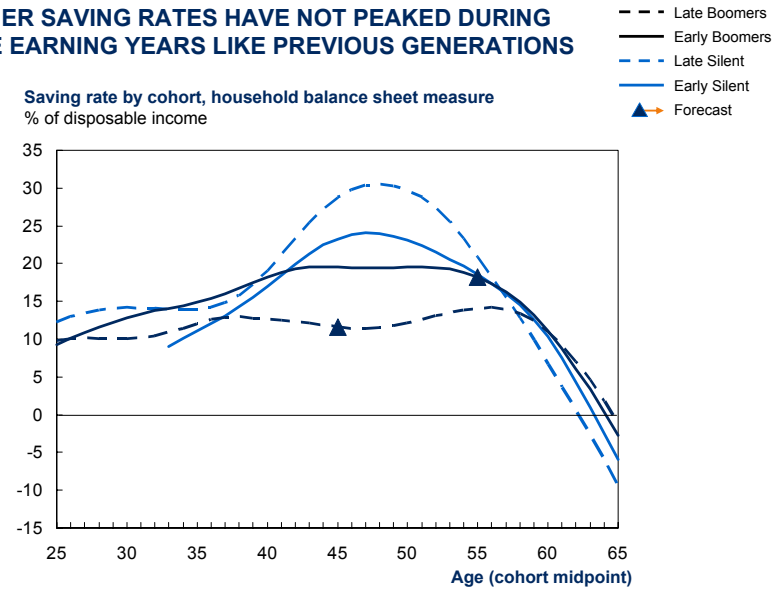


* Equals personal income after taxes less spending, non-mortgage interest payments, and personal transfers.
** Equals the net acquisition of financial assets, real estate assets less net acquisition of financial liabilities.
Source: Bureau of Economic Analysis; National Income & Product Accounts; Board of Governors of the Federal Reserve System; Flow of Funds Accounts of the United States

Indeed the Boomers' saving rate remained so low that even their larger population numbers could not prop up the national rate. In 2005, the Boomers had 47 percent of all disposable income, but contributed only 7 percentage points to overall household savings that year. That is a far smaller share than the previous generation at the same age, even though there were fewer Silent households.

Exhibit 3.7

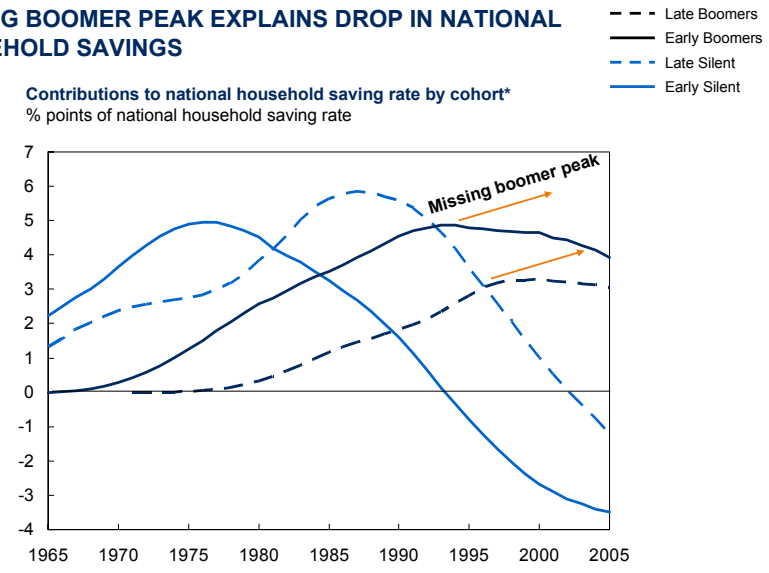
BOOMER SAVING RATES HAVE NOT PEAKED DURING PRIME EARNING YEARS LIKE PREVIOUS GENERATIONS



Source: McKinsey Global Institute US Consumer Model, v7.2

Exhibit 3.8

MISSING BOOMER PEAK EXPLAINS DROP IN NATIONAL HOUSEHOLD SAVINGS



* Equal to cohort saving rate times the share of overall disposable income possessed by the cohort.
Source: McKinsey Global Institute US Consumer Model, v7.2

Meanwhile, older age groups also reduced their saving over the last two decades, but that was because they were following the traditional life-cycle pattern of drawing down previously accumulated resources. By 2005, the Silent generation was aged 61 through 80 and the Late Progressives were in their eighties. The Boomers' contributions to the national saving rate were insufficient to make up for the natural drop-off in savings by these older households. Thus, the decline in the national saving rate was driven primarily by the Boomers' choice of spending over saving between 1985 and 2005.

Boomers' choices were influenced by changes in financial technology and high rates of asset appreciation

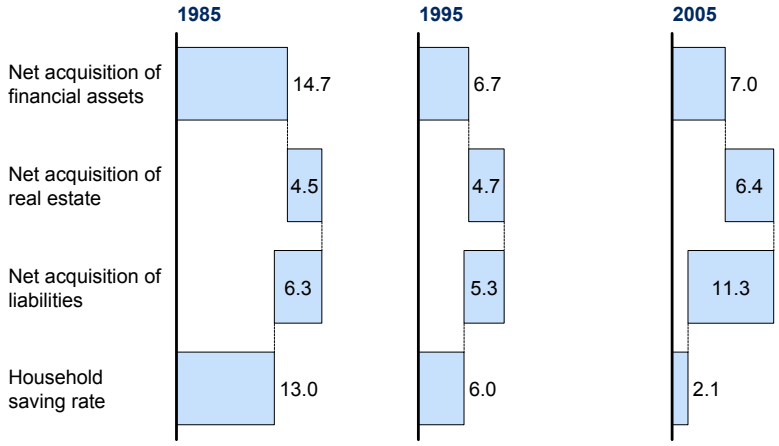
To understand why the Boomers spent so much and saved so little, it is helpful to view savings through the lens of the household balance sheet. A dollar not spent can be deposited in a bank account or used to acquire stocks, bonds, real estate, or other financial assets. Or it can be used to pay down liabilities, such as credit card or mortgage debt. Add it all up and household saving can be defined as the net acquisition of financial and real estate assets, minus the net change in liabilities. Nationally, the level and composition of household savings has shifted significantly since 1985; the net acquisition of financial assets has fallen by half (Exhibit 3.9). Meanwhile, from 2000 through 2005, the housing boom was financed largely by growing mortgage debt.

Exhibit 3.9

FINANCIAL SAVINGS DECLINED 50% AS LIABILITIES ROSE, DRIVING DOWN NATIONAL HOUSEHOLD SAVING RATE

Decomposition of household saving rate, balance sheet view

% of disposable income, 5-year trailing moving average



Source: Board of Governors of the Federal Reserve System; Flow of Funds Accounts of the United States

This shift occurred for two reasons—the "wealth effect" of asset appreciation and increased access to credit. The financial market innovations of the 1980s and '90s turned more Americans into both investors and borrowers. When Americans saw their stocks, homes, and other assets soar in value, they felt emboldened to spend more and save less than they otherwise would have— the so-called wealth effect. At the same time, Boomers borrowed more, piling up more household debt than previous generations.

Changes in financial technology.

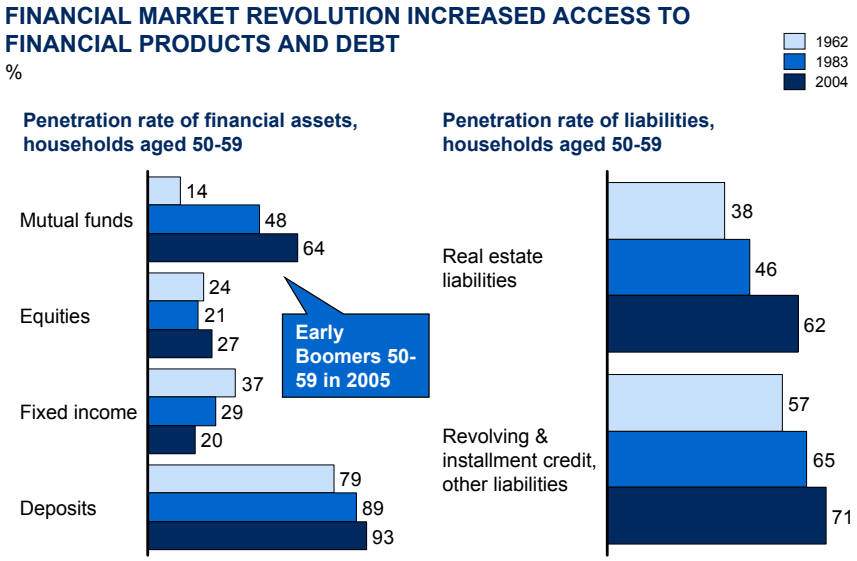
Previous generations didn't perceive a company pension or Social Security as tangible sources of wealth. Most workers didn't know how much their employer was saving on their behalf in the company pension fund or how the money was invested. And the pension disbursement during retirement would be made according to a fixed formula, regardless of the stock market's ups and downs. Likewise with Social Security. But as "defined benefit" pension plans began to decline in the 1980s and "defined contribution" programs such as 401(k) plans replaced them, more Americans started putting aside part of their paychecks, deciding for themselves how to invest it and watching it grow. Mutual funds made it easy to bet on overall market trends. Quarterly statements regularly announced how the accounts were doing. Eventually, the Internet and 24-hour financial news services gave avid investors up-to-the-minute information on the health of their portfolios. Recently, financial firms have offered new investment products enabling small investors to dabble in more exotic equity and bond securities, commodities, and currencies.

Meanwhile, with computerized credit scoring and risk analysis, combined with increasing securitization of consumer debt, lenders could offer more loan products to more Americans. For example, earlier home buyers had few options beyond a 30-year, fixed-rate mortgage, with a 20 percent down payment, at the prevailing interest rate offered by the local savings and loan; today they face a dizzying array of loan options, with variable rates and payment terms, and can shop online among lenders across the country. Lenders also offered consumers new ways to tap their rising wealth through home equity loans and lines of credit and cash-out mortgage refinancing. And with the Internet, all these processes became cheaper, quicker, and easier.

Americans responded to this financial revolution with gusto, investing and borrowing more than ever. The household penetration rates of financial assets and liabilities rose over time (Exhibit 3.10). The share of households holding mutual funds, for example, has more than quadrupled since 1962. The share of house-

holds with home loans has increased 50 percent over the same period, while the percentage of households with revolving and installment credit rose 25 percent. Some of the recent ballooning of debt has proved to be a temporary bubble. Nonetheless, we have seen a onetime, permanent increase in credit access during the Boomers' lifetimes.

Exhibit 3.10



Source: Survey of Consumer Finance; McKinsey Global Institute Analysis

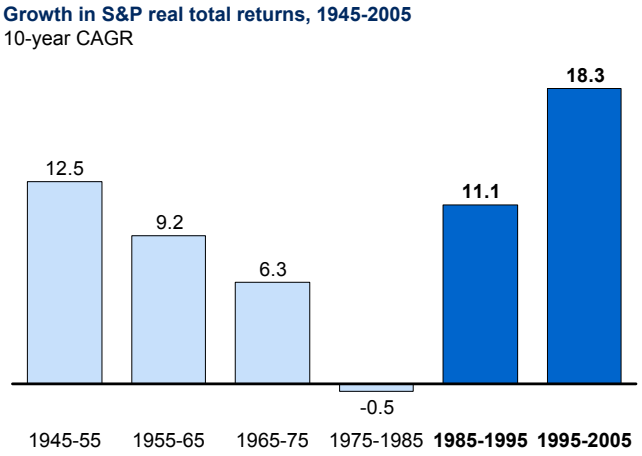
Asset appreciation and the wealth effect.

Again, the Boomers had great timing, catching the stock and real estate waves just as they were swelling to new heights. The equity markets have performed far better since 1985 than in the previous three decades (Exhibit 3.11). The Dow Jones industrial average climbed from around 1,200 in early 1985 to nearly 12,000 at the peak of the stock boom in January 2000. During those years, inflation drifted lower, productivity growth increased, the dollar strengthened, oil tumbled to below $15 a barrel, and the revolutions in telecommunications and Internet use sent technology stocks skyrocketing. The nation enjoyed its longest economic expansion on record over the decade from 1991 to 2001. Meanwhile, the real estate boom caused home values to climb dramatically from 1995 through 2005 (Exhibit 3.12).

Capital gains became an increasingly important source of wealth accumulation during the Boomers' prime. Indeed, from 1985 through 2005, nearly 70 percent of the increase in national household net worth came from capital gains (Exhibit 3.13).

Exhibit 3.11

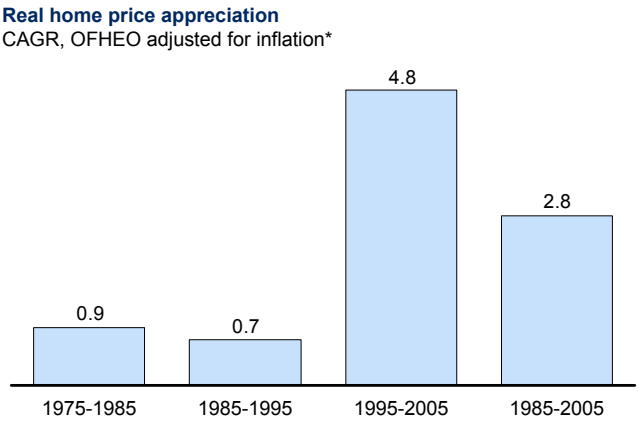
THE STOCK MARKET OUTPERFORMED PREVIOUS HISTORICAL PERIODS DURING THE BOOMER ERA



Source: S&P; Global Financial Data

Exhibit 3.12

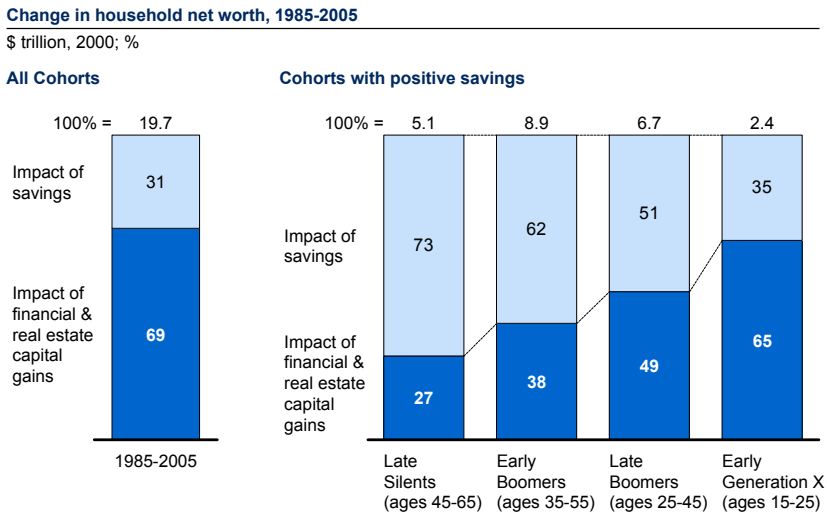
REAL ESTATE HAS BEEN A SIGNIFICANT SOURCE OF CAPITAL GAINS DURING THE PAST DECADE



* OFHEO price index is available from 1975 forward.
Source: Office of Federal Housing Enterprise Oversight; Bureau of Economic Analysis

Exhibit 3.13

CAPITAL GAINS WERE THE MAJOR DRIVER OF INCREASES IN NET WORTH PARTICULARLY FOR YOUNGER COHORTS



Note: Ages refer to cohort midpoints.
Source: McKinsey Global Institute US Consumer Model, v7.2

Looking at different age cohorts, we see that younger households relied most heavily on asset appreciation to build their wealth. This may seem natural, as younger households tend to hold riskier portfolios. But older households tend to hold the bulk of residential real estate assets, and thus they gained more from the rise in housing wealth. When we control for these behavioral patterns, the overall finding is unchanged—the Boomers have relied more on asset appreciation than on saving to accumulate wealth. This reversed the practice of previous generations. For example, 43 percent of Early Boomers' gains in net worth from age 45 through 55 (1995–2005) stemmed from capital gains (Exhibit 3.14). In contrast, when the Silents were in that age group, they relied almost entirely on saving, gaining minimal increases in net worth from capital gains.

The Boomers responded to this rapid asset appreciation by spending more and acquiring fewer new assets than they otherwise might have (Exhibit 3.15). Consumer spending had been the main fuel of the nation's economic growth engine since the end of World War II, but the wealth effect turbocharged Boomer spending. Personal consumption accounted for around two-thirds of the growth in inflation-adjusted GDP during the two decades from 1975 through 1995. That share jumped to 78.6 percent from 1995 through 2005 (Exhibit 3.16).

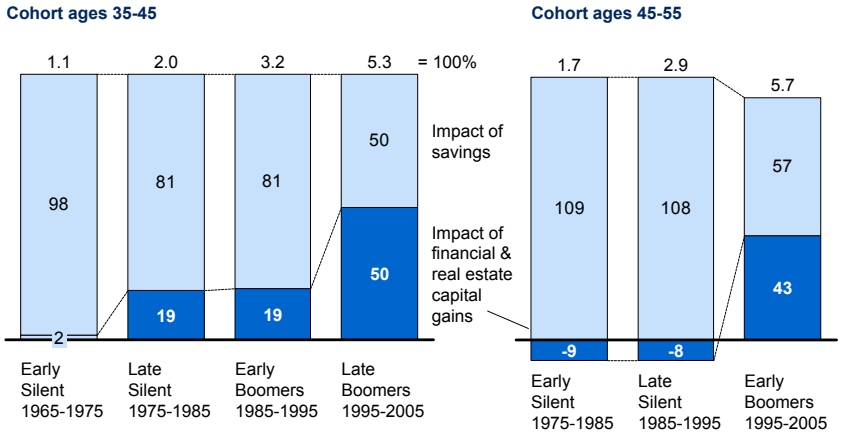
Another key factor dragging down the national saving rate was the significant rise in household borrowing during the real estate boom. The Boomers were

Exhibit 3.14

BOOMERS HAVE BENEFITED DISPROPORTIONATELY FROM ASSET APPRECIATION

Change in household net worth at the same age*

$ trillion, 2000; %



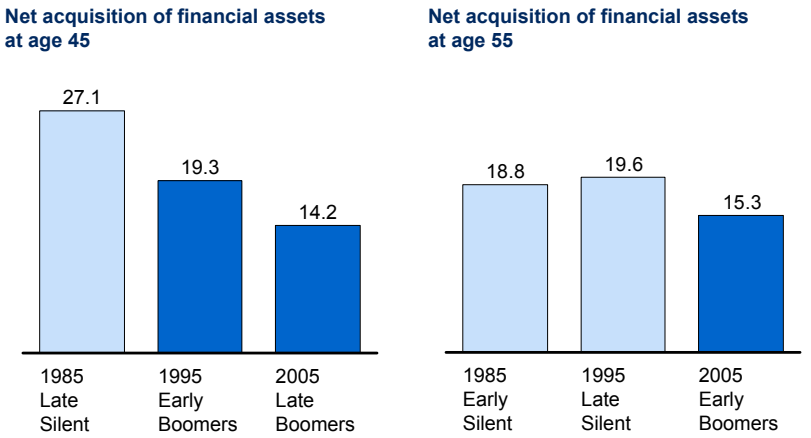
Note: Age refers to cohort midpoint.

Source: McKinsey Global Institute; US Consumer Model, v7.2

Exhibit 3.15

HIGH RATES OF FINANCIAL MARKET APPRECIATION COINCIDED WITH A FALL-OFF IN FINANCIAL SAVINGS BY THE BOOMERS

% of disposable income

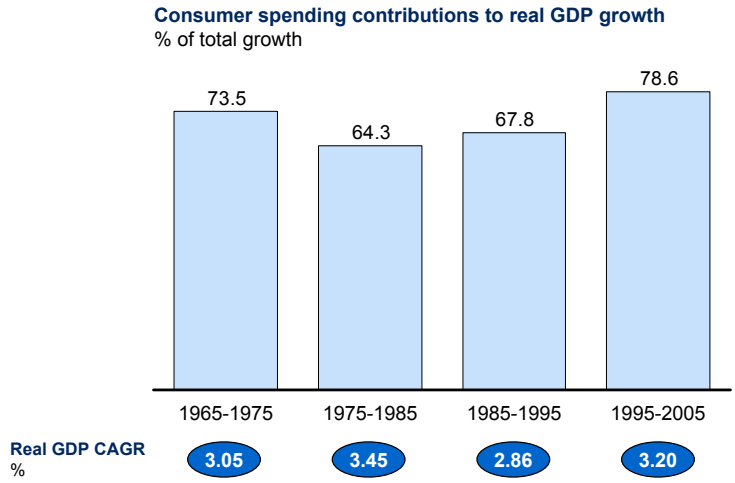


Note: Age refers to cohort midpoint.

Source: McKinsey Global Institute US Consumer Model, v7.2

Exhibit 3.16

US ECONOMIC GROWTH INCREASINGLY DRIVEN BY CONSUMER SPENDING



Source: McKinsey Global Institute US Consumer Model, v7.2

responsible for close to half of the net increase in household liabilities in recent years despite being at an age when they should be saving. Meanwhile, Generation Xers, who are earlier in their life cycle and at a natural stage for borrowing, accounted for approximately the other half of the increase (Exhibit 3.17).

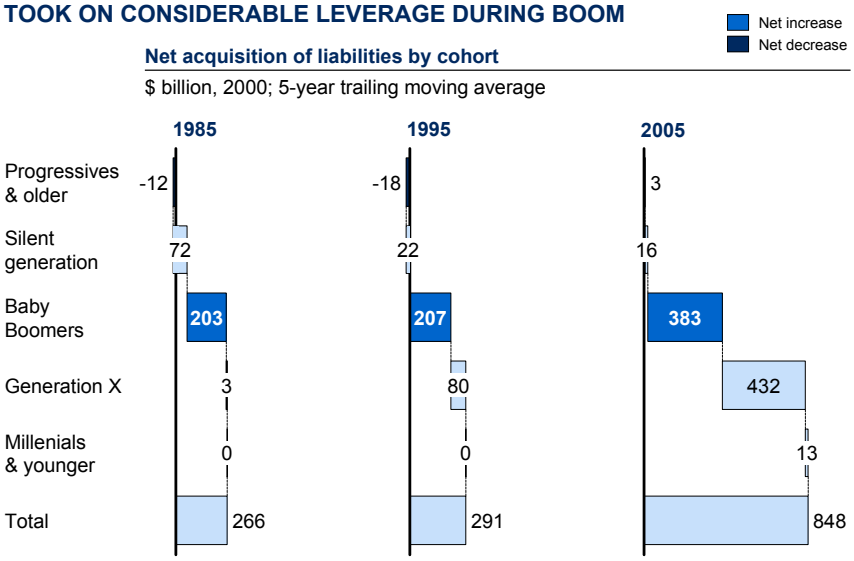
The Boomers took on new debt at a much higher rate than did previous generations at the same ages. Because acquisition of new liabilities reduces savings, the Boomers' borrowing lowered their saving rate and the national rate, while leaving them more indebted than earlier generations at the same age. The average Boomer household in 2005 has nearly 1.5 times as much debt as a Silent household at the same age 20 years earlier (Exhibit 3.18). When average liabilities are compared with net worth, Boomers have a household debt ratio that is two-thirds higher than the Silents' ratio. And we see this pattern among Boomer households at all income levels (Exhibit 3.19).

BOOMERS ARE THE WEALTHIEST COHORT IN HISTORY, BUT THE DISTRIBUTION IS SKEWED

Despite their low savings and heavy debt, Boomers collectively are the wealthiest US generation ever, thanks to the spectacular run-up in stock and home prices. Even with the recent corrections in equity and real estate prices, the Boomers are likely to hold more wealth than any other US age cohort through the next two decades (Exhibit 3.20).

Exhibit 3.17

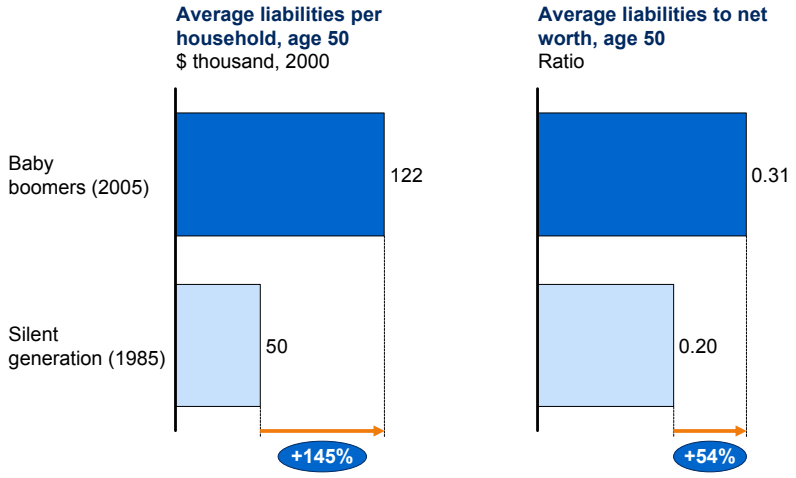
BOOMERS HAVE DRIVEN INCREASE IN LIABILITIES AND GEN-XERS TOOK ON CONSIDERABLE LEVERAGE DURING BOOM



Source: McKinsey Global Institute US Consumer Model, v7.2

Exhibit 3.18

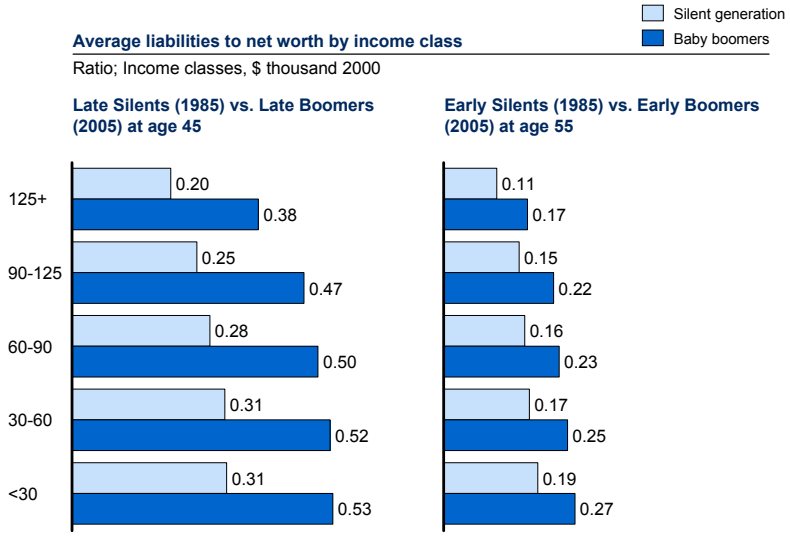
BOOMER HOUSEHOLDS ARE FAR MORE LEVERAGED THAN THEIR SILENT COUNTERPARTS WERE AT THE SAME AGE



Note: Age refers to cohort midpoint.
Source: McKinsey Global Institute US Consumer Model, v7.2

Exhibit 3.19

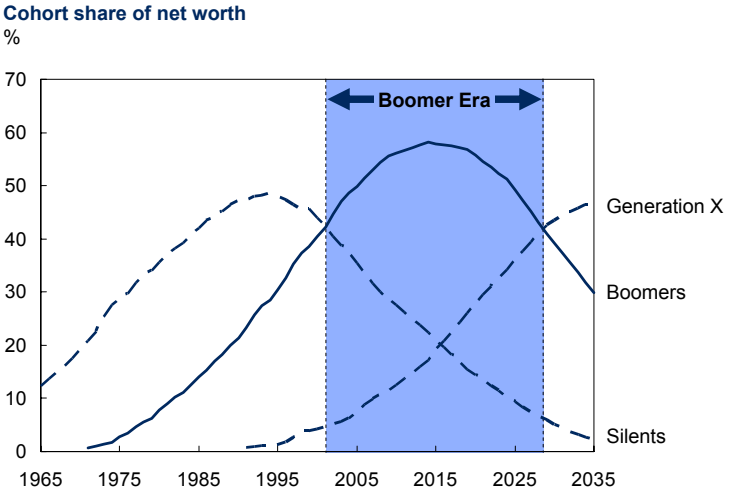
HIGHER LEVERAGE RATIOS EXIST AT ALL LEVELS OF INCOME



Note: Age refers to cohort midpoint.
Source: McKinsey Global Institute US Consumer Model, v7.2

Exhibit 3.20

BOOMERS HOUSEHOLDS ARE EXPECTED TO BE THE LARGEST HOLDERS OF WEALTH FOR THE NEXT TWO DECADES

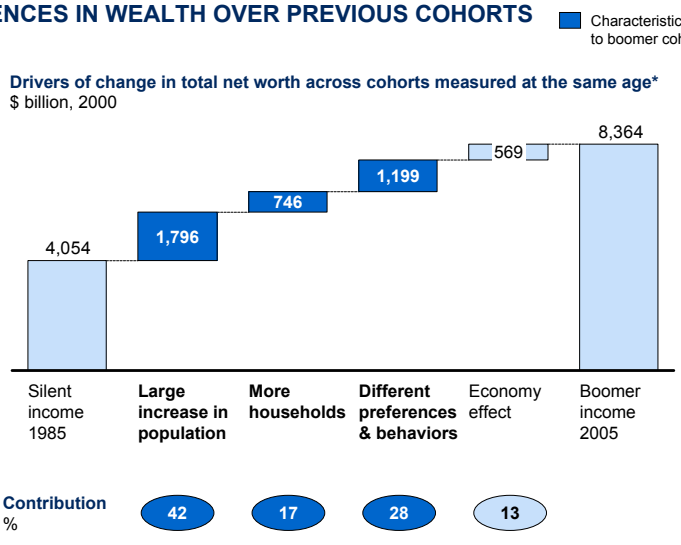


Source: McKinsey Global Institute US Consumer Model, v7.2

The Boomers' extra wealth resulted from the same four factors that boosted their incomes and spending relative to the previous generation (Exhibit 3.21). First, they are collectively wealthier in part just because there are more of them; their larger population numbers explain about 42 percent of the difference. Some 17 percent results from their smaller household size, which yielded more households, and meant they bought more real estate than they otherwise would have. An additional 28 percent of the difference reflects the Boomers' personal saving and investment choices. For example, the rising numbers of women in the workforce meant they could sign up for their own 401(k)s. The same higher education that boosted Boomer incomes gave them more money to invest. And Boomers were more likely than earlier generations to prefer higher-yielding equity investments over lower-yielding fixed-income assets. The remaining 13 percent of the difference stems from the overall economic growth of their times.

Exhibit 3.21

BOOMER'S CHOICES WERE ALSO AN IMPORTANT FACTOR DRIVING DIFFERENCES IN WEALTH OVER PREVIOUS COHORTS



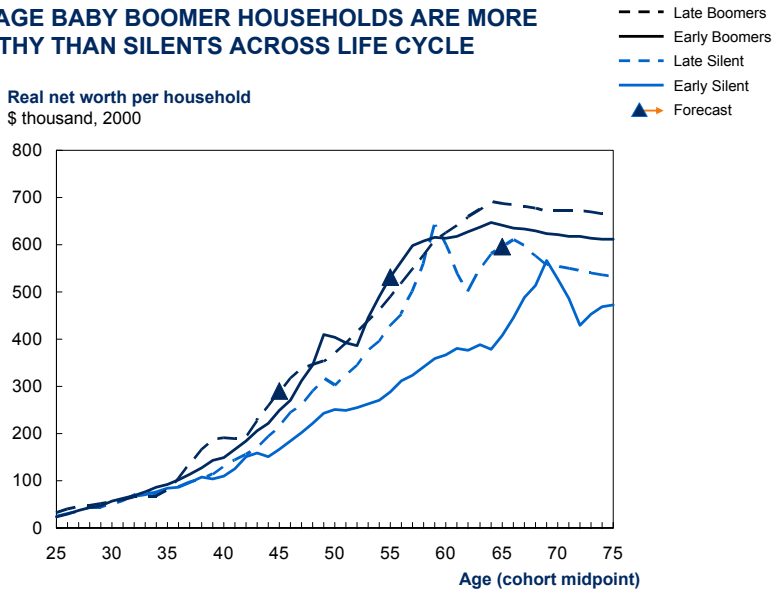
* Decomposition compares 10 year cohorts at the same age: Early Boomers vs. Early Silents at age 55; Late Boomers vs. Late Silents at age 45. Age refers to cohort midpoint.

Source: McKinsey Global Institute US Consumer Model, v7.2

When the Boomers' collective fortune is divided up on paper, the average household is wealthier than those of previous generations at almost every age (Exhibit 3.22). However, the average masks the fact that the Boomers' wealth is held disproportionately by upper-income households and has become more concentrated over time (Exhibit 3.23). By 2005, for example, 56 percent of the Boomers' wealth was held by households with annual incomes of $90,000 and above, who accounted for 20 percent of Boomer households. Broken down further, 42 percent of Boomer wealth was held by the 10 percent of households with incomes above $125,000.

Exhibit 3.22

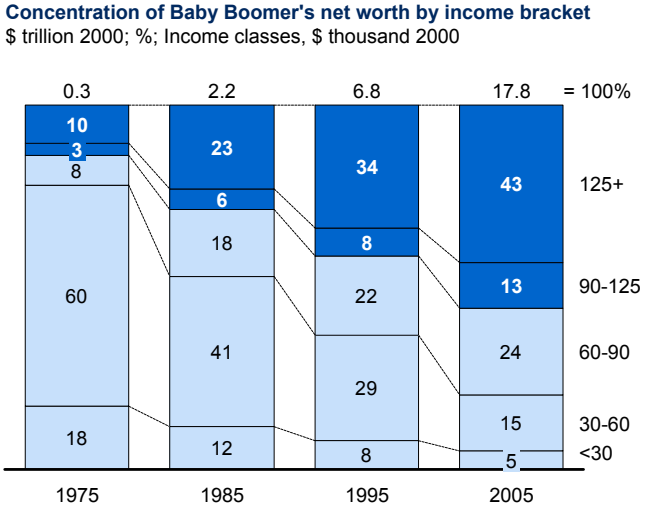
AVERAGE BABY BOOMER HOUSEHOLDS ARE MORE WEALTHY THAN SILENTS ACROSS LIFE CYCLE



Source: McKinsey Global Institute US Consumer Model, v7.2

Exhibit 3.23

RISING AVERAGE IS DRIVEN IN PART BY GROWING WEALTH OF UPPER INCOME BRACKETS

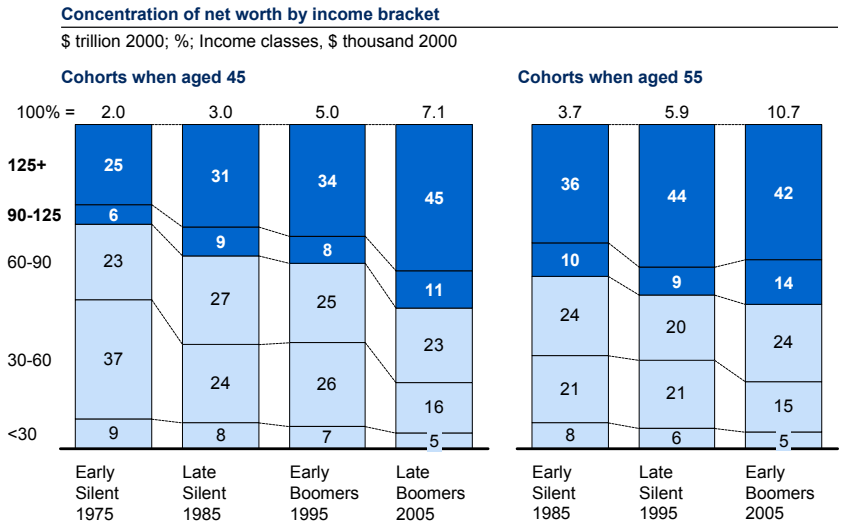


Note: Figures may not sum due to rounding
Source: McKinsey Global Institute; US Consumer Model, v7.2

Indeed, US household wealth overall has steadily become more concentrated at the top over the last 30 years. The Boomers' wealth was more concentrated among upper-income households than was the wealth of earlier generations at the same ages (Exhibit 3.24). This skewed distribution of wealth suggests that some Boomers are well positioned to enjoy their golden years but that many others will face financial challenges as they head for retirement.

Exhibit 3.24

WEALTH IS MORE CONCENTRATED FOR BOOMERS THAN PREVIOUS COHORTS AT SAME AGE



Note: Age refers to cohort midpoint. Figures may not add due to rounding.
Source: McKinsey Global Institute US Consumer Model, v7.2

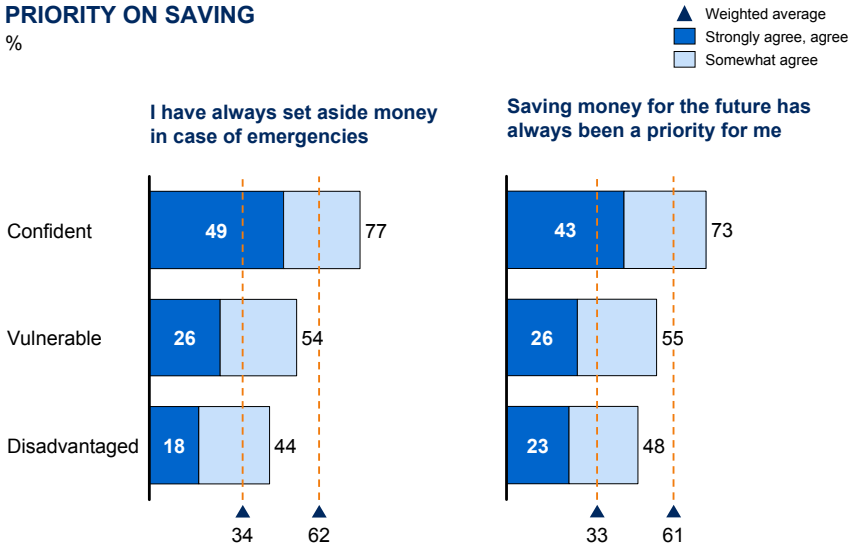
BOOMERS FEEL ENTITLED TO A GOOD LIFE BUT ARE WORRIED ABOUT THE FUTURE

Indeed, many Boomers are uncertain about their financial future. Just a quarter of the Boomers surveyed said they believe they will have adequate savings to last through retirement. Another quarter is only somewhat sure they will have enough. Yet not all Boomers have the same view of savings or their retirement prospects. Half of the confident Boomers say they set aside money for emergencies, and 43 percent of them said that saving money for the future was a priority. Just 26 percent of vulnerable Boomers and less than a quarter of the disadvantaged say the same (Exhibit 3.25). And almost half—45 percent—of the vulnerable and disadvantaged worry that they have not planned sufficiently for retirement, while more than half are concerned about paying for their health care as they age (Exhibit 3.26).

Exhibit 3.25

VULNERABLE AND DISADVANTAGED BOOMERS DID NOT PUT A PRIORITY ON SAVING

%

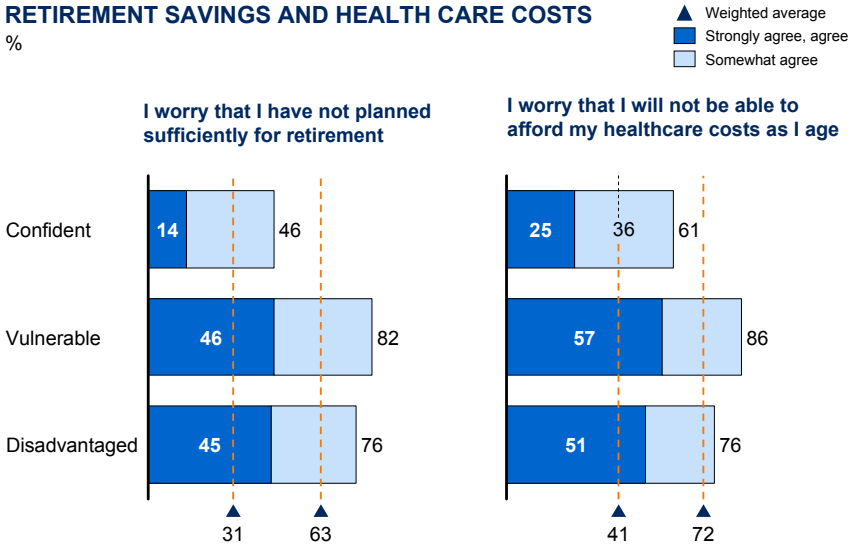


Source: US Aging Consumer Survey, 2007

Exhibit 3.26

VULNERABLE AND DISADVANTAGED BOOMERS WORRY ABOUT RETIREMENT SAVINGS AND HEALTH CARE COSTS

%



Source: US Aging Consumer Survey, 2007

Ironically, despite the run-up in debt we have seen, Boomers generally don't conceive of themselves as willing to take on liabilities. Just 8 percent of Boomers say they are willing to take on debt to buy what they want, and this share grows to just one-third when we include those who "somewhat" feel that way. More than a third said that when they see something they want but cannot afford, they tend to save until they can pay for it in full; that share grows to nearly three out of four when we include those who "somewhat" feel that way.

Yet many Boomers also expressed a sense of entitlement that helps explain their spending and saving behavior. More than half of Boomers surveyed at least somewhat agree with the statement that "one should enjoy life today, even if it means saving less for the future."

4. You Can't Always Get What You Want

We have seen how the Baby Boomers' finances were buoyed through their lives by strong economic growth, solid increases in asset prices, and onetime factors such as the entry of women into the labor force. But they won't be able to count on those trends to continue in the years ahead. On the contrary, as the first wave of Boomers begins to retire, the US economy is downshifting in several ways.

The Boomers are one cause of this cooling, and they will be deeply affected by it. Both the US workforce and consumer spending will grow more modestly in the years ahead as so many Americans move from their prime into their golden years. As a result, incomes, living standards, and GDP are likely to rise more slowly for some time to come.

In this chapter, we will show how inadequate saving, income and wealth inequality, and the slowing economy have left more than two-thirds of Boomer households financially unprepared for retirement. That is, they do not have sufficient resources to support a typical spending pattern in their senior years. This leaves barely one in three households that are prepared.

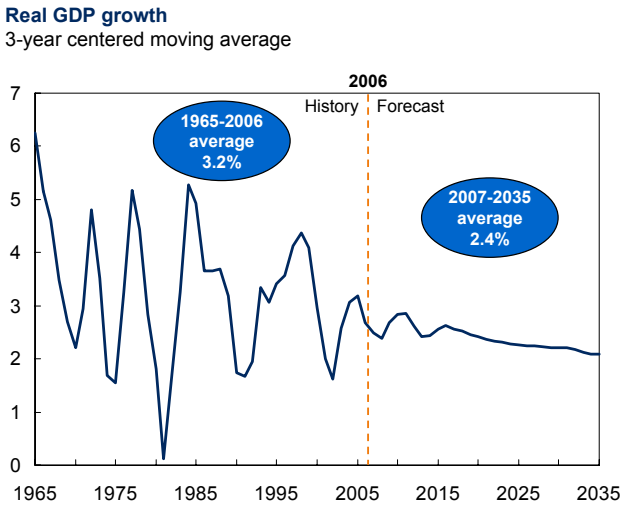
So even though they are collectively the richest cohort in history, many Boomer households are much less prepared for retirement than others. Strikingly, we find that many Boomers do not even realize they are in trouble; about half of the households that are confident about their financial future are actually not prepared for retirement.

THE ECONOMY WILL BE BUFFETED BY HOUSING TURMOIL IN THE NEAR TERM AND AGING POPULATION IN THE LONG TERM

Since the birth of the youngest Boomer in 1964, the United States has enjoyed on average a period of brisk economic growth. Over the last 40 years, real GDP increased at an average rate of 3.2 percent annually. But this period of long-run high growth is coming to an end. For the next few decades, the United States will face significantly slower growth that will average 2.4 percent per year between now and 2035 (Exhibit 4.1). The farther out into the forecast we go, the slower the growth rate. And growth in per capita GDP slows similarly.

Exhibit 4.1

STRUCTURAL FACTORS AND AN AGING SOCIETY WILL SLOW US LONG-TERM GROWTH



Source: McKinsey Global Institute US Consumer Model, v7.2

In the near term, the bursting of the housing bubble that began in 2007 has created liquidity and solvency problems in the financial system. It has put a significant dent in consumer confidence and created the risk of recession. The Federal Reserve has been forced to take a number of unprecedented measures to bolster the financial system and help avert a recession. During the writing of this report in the first quarter of 2008, there is still a great deal of uncertainty on how this will play out both for the financial sector and the economy as a whole.

However, as important as these short-term issues are, of potentially more lasting consequence are some medium- and longer-term structural issues affecting the US economy. First is the simple fact that as Boomers age and retire, the

US workforce will grow more slowly, thus slowing the potential growth of US output. Second, as noted previously, the boosts to US education levels and labor force participation from the entry of women into the workforce were onetime gains that have largely played out as education levels have roughly equalized and female labor participation appears to have peaked. Third, as we have seen, the Boomer spending spree that has been one of the major engines of US (and world) economic growth was largely borrowed from the future. The Boomers face a future of significantly reduced spending, and it will be difficult for the cohorts behind them to fill that gap.

Specifically for the Boomers, a combination of the bursting of the housing bubble, a slowdown in overall growth, too little savings, and rapidly rising medical costs creates conditions that justify their feelings of anxiety.

Turmoil in the housing market is slowing economic growth and wealth accumulation in the near term

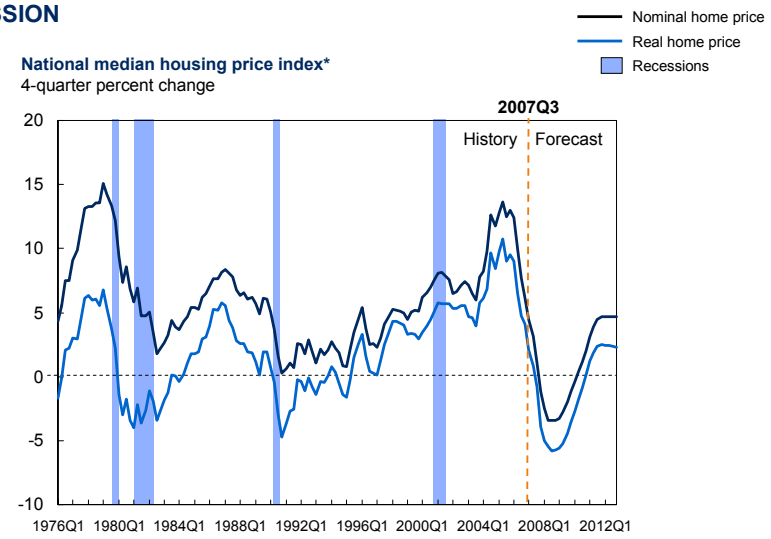
The turmoil in the nation's housing and credit markets is clearly taking a toll on the economy. A growing supply of unsold homes has caused new construction to plummet, while demand has been depressed by the credit squeeze caused by the collapse of the subprime mortgage market. This combination has caused home prices to fall in many parts of the country. And we expect prices to fall further. Our forecast, which was completed in the fourth quarter of 2007, projects a 6.2 percent drop in the US median home price from its high point in 2007 to a low point in 2009.[1] This translates into an 11 percent decline after adjusting for inflation. Real home prices have not fallen since the 1991 Persian Gulf War and the recession that followed (Exhibit 4.2). Given the high degree of uncertainty in the market as we write this report, there is further risk that price declines may turn out to be worse than projected.

Facing falling home values, households will also be less willing to spend on home improvements. The drop in prices, combined with the slowdown in construction and improvements, will be enough to reduce household real estate wealth to pre-boom levels (Exhibit 4.3). We forecast that by 2012, the nation will have approximately $4 trillion less in real housing wealth than it would have if housing prices were to stall for the next two years and not fall. But after the correction plays out, we forecast that real estate wealth will start growing again at its long-term, pre-2000 trend pace.

1 We use the US Office of Federal Housing Enterprise Oversight (OFHEO) House Price Index, as that is the index used to measure household wealth in the US Flow of Funds Accounts.

Exhibit 4.2

REAL HOME PRICES WILL LIKELY FALL MORE THAN IN 1990s RECESSION

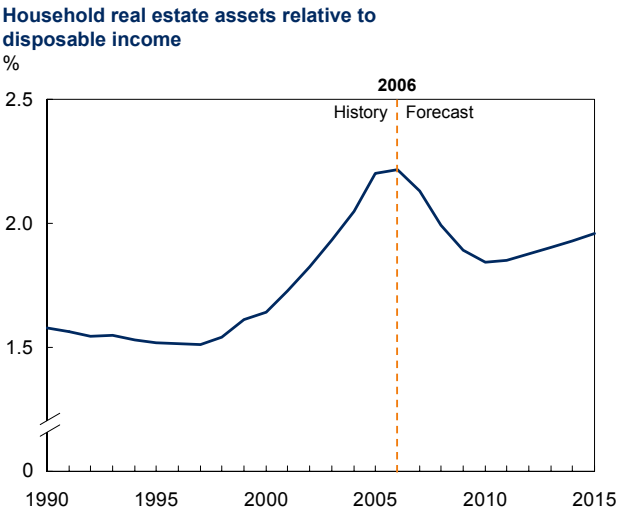


* OFHEO median home price index.

Source: McKinsey Global Institute US Consumer Model, v7.2; NBER Business Cycle Dates

Exhibit 4.3

COMBINED IMPACT OF SLOWDOWN IN NEW CONSTRUCTION PLUS DROP IN VALUATIONS WILL REDUCE REAL ESTATE WEALTH



Source: McKinsey Global Institute US Consumer Model, v7.2

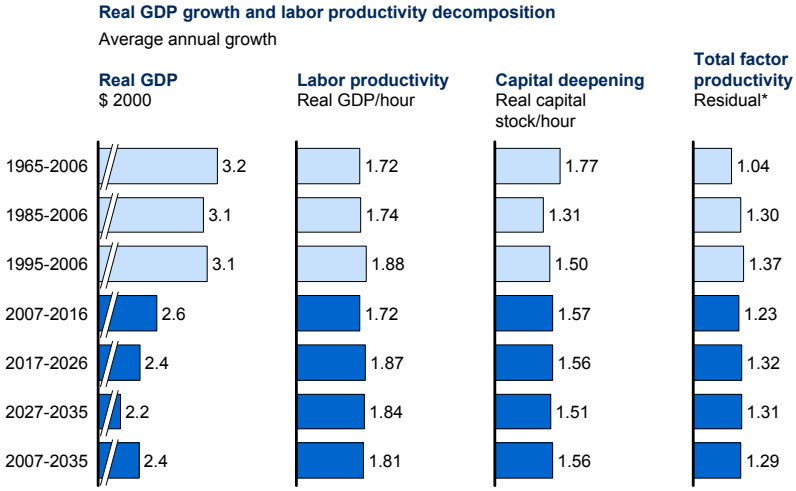
Those Boomers who had counted on rising home prices to boost their retirement savings are now more vulnerable. At an estimated $9.1 trillion in 2007, real estate accounted for more than 35 percent of Boomer household assets and 45 percent of their net worth. We expect that between the peak and trough of the housing boom, Boomers will collectively experience an 8 percent, or approximately $670 billion, real decline in the value of their houses. As Boomers see the value of their homes decline, the "wealth effect" of higher spending spurred by higher real estate prices will go into reverse, dampening their spending.

The Boomers' aging and retirement will slow economic growth in the decades ahead

Even after the housing market has recovered, US economic growth will be cooler than before because the Boomers will gradually retire. The economy's potential growth rate depends on increases in the labor force, productivity, and capital investment. If the workforce expands more slowly and the other two factors stick to their long-term trends, GDP will rise more slowly as well (Exhibit 4.4).

Exhibit 4.4

LESS LABOR MEANS LESS POTENTIAL GDP GROWTH IF CAPITAL EXPENDITURES AND PRODUCTIVITY MATCH HISTORICAL PRECEDENTS



* Assumes labor share of 0.65 and capital share of 0.35 in Cobb-Douglas production function. Labor productivity growth (in logarithms) equals capital deepening times capital share plus total factor productivity.

Source: McKinsey Global Institute US Consumer Model, v7.2

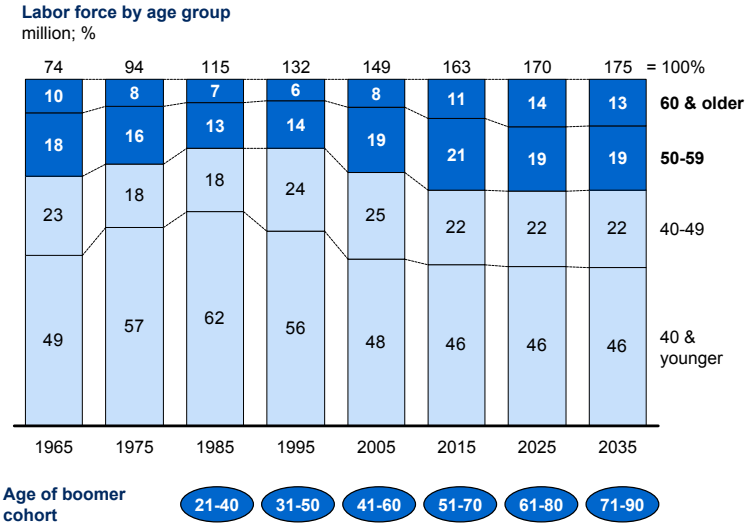
When the Boomers were younger, they entered the workforce in greater numbers than their predecessors were leaving, raising the rate of labor force growth. Looking ahead, as the Boomers exit the workplace, younger workers will continue to join, but not in sufficient numbers to support the same pace of growth: The labor force will continue to expand, but not as quickly as before. It is possible

that productivity growth or capital spending could pick up, compensating partly or entirely for the slowdown in labor force growth. But we align our base forecast with the consensus and do not assume such a pickup. The result will be lower potential GDP growth. Thus, the entire country will feel the effects of the Boomers' aging.

The US labor force is already graying as the Early Boomers enter their sixties and as many older Americans linger on the job later in life. In 1985, most of the workforce (62 percent) was younger than 40, while just 7 percent were 60 or older. By 2025, less than half the workforce (46 percent) will be under 40, and the share 60 and over will have doubled to 14 percent (Exhibit 4.5).

Exhibit 4.5

THE LABOR FORCE WILL GET OLDER AS THE BOOMERS AGE

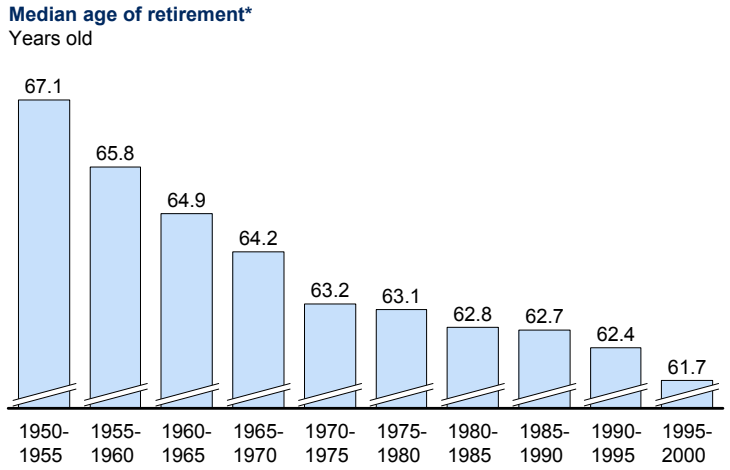


Note: Figures may not sum due to rounding
Source: McKinsey Global Institute US Consumer Model, v7.2

The Boomers will likely work later in life than their predecessors. In 1950, the median age for retirement was 67. Then with rising affluence, growth in company pensions, and government programs such as Medicare and Social Security Disability Benefits, the median age of retirement fell for 50 years to age 62 in 2000 (Exhibit 4.6). But as health has improved in later years and life expectancies have risen, many people have chosen to stay in the workforce longer. When looked at by cohort, it appears that the median retirement age bottomed out with the Early Silents at 61.7 and has since risen with the Late Silents to 62.3 years. We expect this modest rebound to continue, with the Boomers' retirement age gradually nudging closer to 63 (Exhibit 4.7).

Exhibit 4.6

THE RETIREMENT AGE HAS BEEN DECLINING FOR 50 YEARS

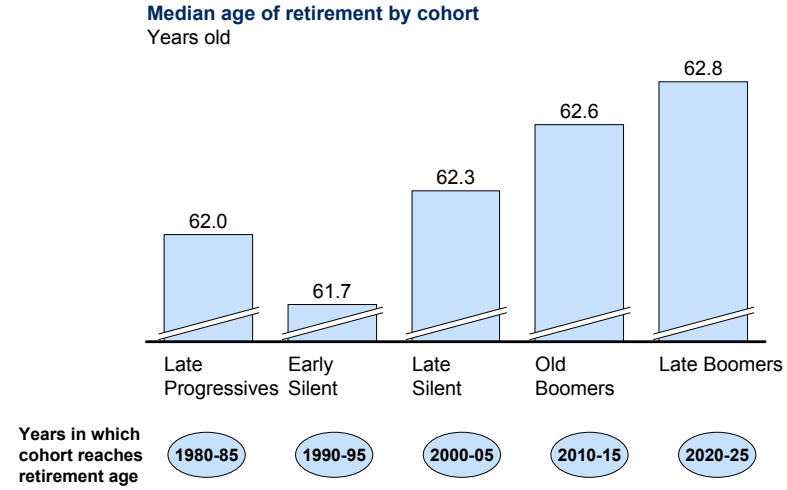


* Estimated using cohort methodology. Annual retirement rates reflect impact of retirements across all cohorts in a given year.

Source: Murray Gendell, "Retirement Age Declines Again in the 1990s," *Monthly Labor Review*, October 2001

Exhibit 4.7

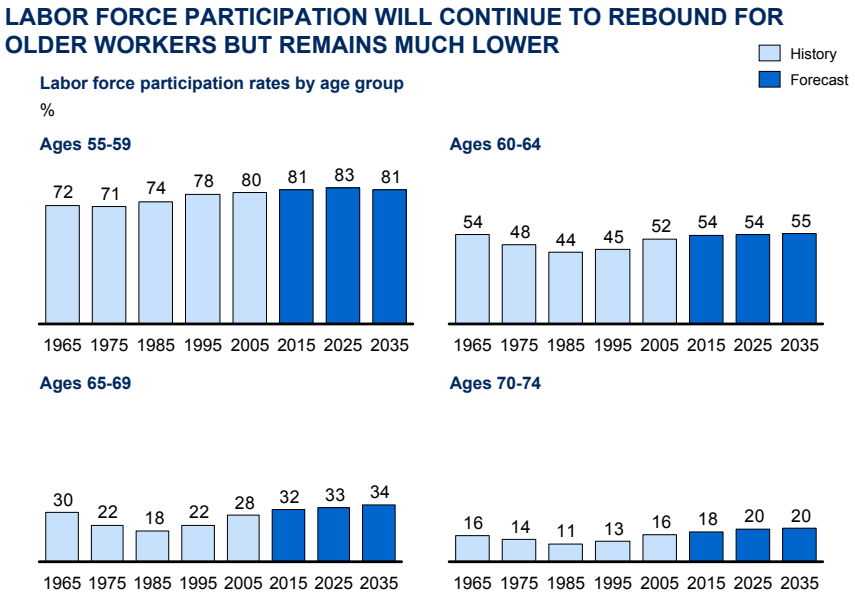
WE ESTIMATE THAT COHORT-SPECIFIC RETIREMENT AGES BOTTOMED OUT IN 1995 AND WILL RISE MODESTLY WITH THE BOOMERS



Source: McKinsey Global Institute US Consumer Model, v7.2; For calculation methodology, see Murray Gendell, "Retirement Age Declines Again in the 1990s," *Monthly Labor Review*, October 2001

This rise in the retirement age will have an impact on labor force participation as well. Labor force participation rates for Americans over age 60 declined from the 1960s to 1980s but have since edged back up (Exhibit 4.8). In 1985, for example, 44 percent of Americans aged 60 through 64 had a job or were seeking one; by 2005, more than half (52 percent) were in the workforce. We project this share will rise further to 55 percent by 2035.

Exhibit 4.8



Source: McKinsey Global Institute US Consumer Model, v7.2; Bureau of Labor Statistics

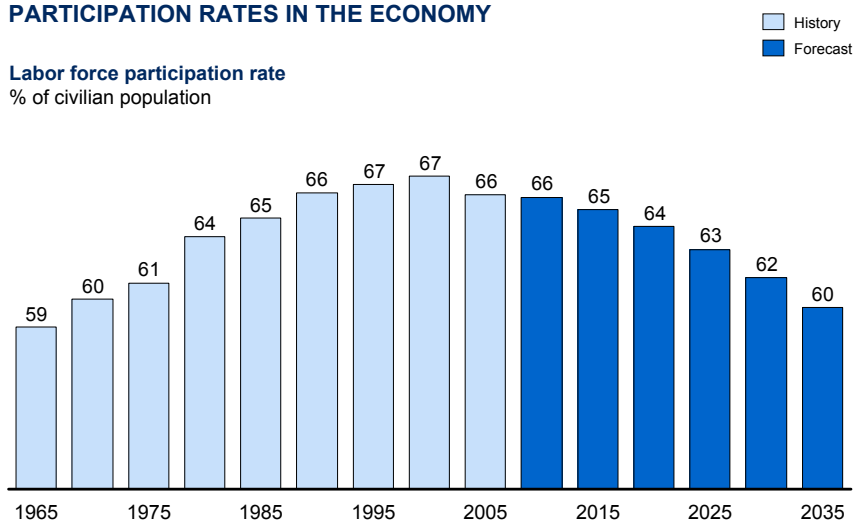
Even so, older people still work much less than younger people. In 2005, the labor force participation rate for Americans aged 25 through 54 was 83 percent—more than half again as high as the rate for those aged 60 through 64. As the Boomers age and retire, their rate will fall, too. And just as their higher participation rate lifted the national rate in their prime, so will their declining rate pull down the national rate in their sunset years (Exhibit 4.9).

Combining the effects of the housing bust and the Boomers' aging, we project that long-run real US GDP growth will drop from its four-decade trend of 3.2 percent per year to 2.4 percent through 2035 (see Exhibit 4.4). This 0.8 percentage point drop in long-run trend growth represents a major shift for the United States to a pace of growth closer to what Europe has experienced over past decades than what the United States is accustomed to. If the economy continued growing at its 1965–2006 pace, real GDP would be $28.2 trillion. Instead, at this slower pace, real GDP would reach $22.4 trillion, a difference of $5.8 trillion. Similarly,

real GDP per capita in our baseline scenario reaches $60,260. It would have reached $75,950 if growth had been maintained at the earlier higher pace. Our forecast is in line with the broad consensus of economists, but it may come as an unpleasant surprise to others.

Exhibit 4.9

AGING OF THE BOOMERS WILL DRIVE DOWN OVERALL LABOR FORCE PARTICIPATION RATES IN THE ECONOMY



Source: McKinsey Global Institute US Consumer Model, v7.2; Bureau of Labor Statistics

Spending will slow more than income and risks "crowding out" from rising medical costs

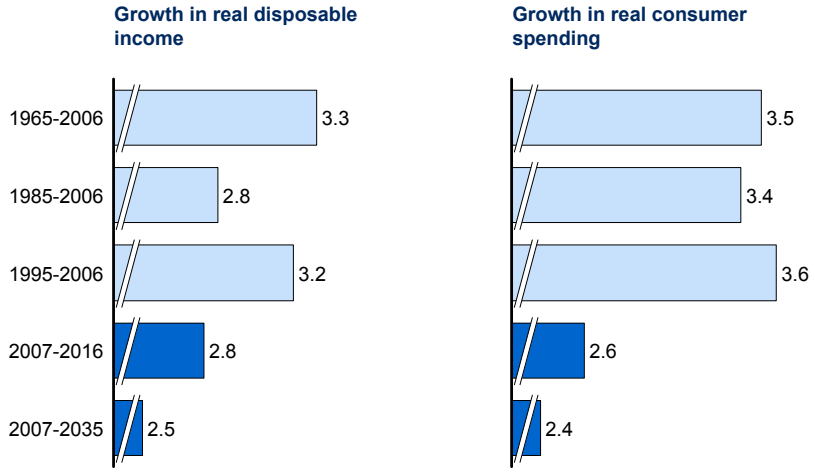
Cooler economic growth means US household incomes will rise more slowly as well. But we expect spending growth to slow even more (Exhibit 4.10). An aging population alone would cause spending to slow as people reach the later years of their income and spending life-cycle curve. However, the combination of low Boomer savings and declining home equity means the Boomers will likely rein back more on spending than previous aging generations (we will discuss this in more detail shortly). Together, the retirement of the Boomers and the bursting of the credit bubble means that the 20-year decline in the US household savings rate has likely bottomed out at less than 1 percent of disposable income today, and we expect a modest recovery to annual saving of just above 3 percent by 2035 (Exhibit 4.11).

Older consumers also spend their money differently than younger households, and as the Boomers age, their size means they will drive a shift in overall US spending, just as they did in their younger years. Medical spending is the most obvious growth area for older consumers. Increased demand from the demographic bulge

Exhibit 4.10

LOWER OVERALL ECONOMIC GROWTH IMPLIES LESS INCOME GROWTH FOR HOUSEHOLDS AND LESS SPENDING

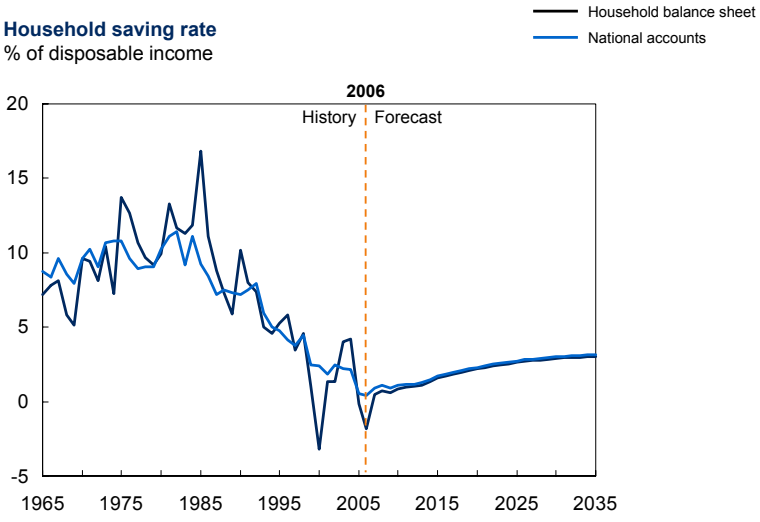
CAGR; %



Source: McKinsey Global Institute US Consumer Model, v7.2

Exhibit 4.11

SPENDING GROWTH WILL SLOW MODESTLY RELATIVE TO INCOME PUSHING HOUSEHOLD SAVINGS ABOVE HISTORIC LOWS

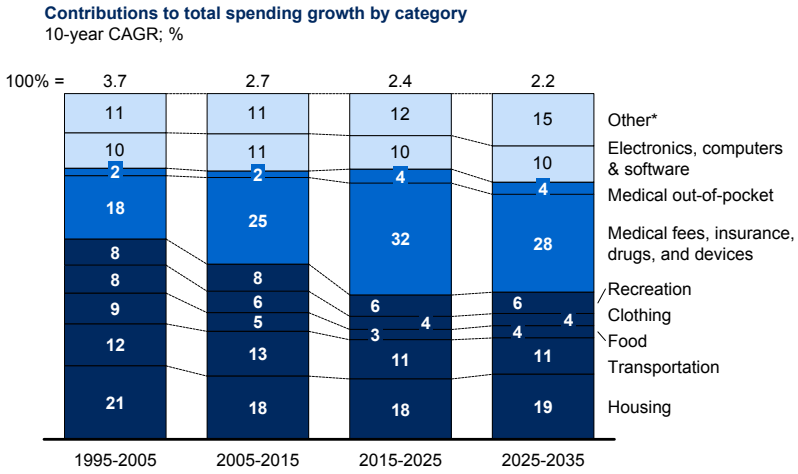


Source: McKinsey Global Institute US Consumer Model, v7.2

of the Boomers plus continued technological innovations will cause health care spending to balloon. From 20 percent of real spending growth between 1995 to 2005, health care will account for 27 percent of spending growth over the coming decade (Exhibit 4.12). As the Boomers continue to age, health care will account for more than a third of real spending growth from 2015 to 2025, potentially crowding spending growth in other categories such as food, clothing, transportation, and recreation. Major reforms in the US health care system to reduce growth in health care spending would help ease the crowding-out effect on consumer spending.

Exhibit 4.12

AS BOOMERS AGE MEDICAL SPENDING DRIVES MORE THAN A THIRD OF GROWTH CROWDING OUT OTHER CATEGORIES



* Other includes education, charity and welfare, personal business and personal goods spending.
Note: Figures may not sum because of rounding.
Source: McKinsey Global Institute US Consumer Model, v7.2

One category that appears resistant to medical crowding out is consumer electronics, which we expect to hold a steady share of growth as continued innovations and falling prices drive demand. Our survey of Boomer households showed that even as they age, Boomers are likely to remain keen on electronic gadgets and open to new technology. According to our survey, 85 percent of Boomers find the Internet to be an important tool for dealing with their lives. Likewise, growth in housing spending should gradually return to historic levels after dipping over the coming years.

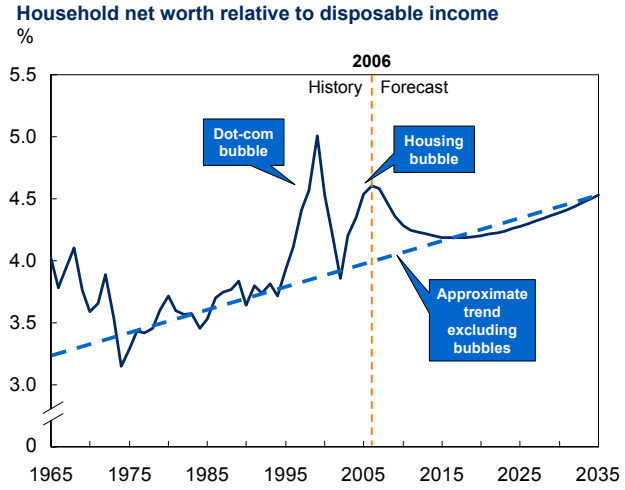
Household wealth creation will slow

Household net worth can increase if households save more or if their existing assets appreciate. Growth in net worth will be helped by the rebound in saving out

of disposable income, although this rebound is modest, bringing saving rates only up to the level attained in the mid-1990s. But it will be moderated by rates of asset appreciation that settle at their long-term averages, which are slower than the rates experienced in recent years.[2] The result of this is that household net worth creation measured relative to disposable income will return to its long-term trend after corrections in the housing and financial markets play out (Exhibit 4.13).

Exhibit 4.13

GROWTH IN HOUSEHOLD NET WORTH RETURNS TO LONG-TERM TREND WHEN MEASURED AGAINST DISPOSABLE INCOME



Source: McKinsey Global Institute US Consumer Model, v7.2

However, we project that the growth in real net worth per household slows from 2.6 percent per year from 1975 to 2006 to 1.4 percent from 2007 to 2035 because of slower income growth, modest saving rates, and historically average returns. Furthermore, the rate of household formation drops from 1.5 percent per year to 1 percent over the same period. The combined impact of these two trends is that total real net worth held by households will grow at only 2.4 percent per year over the next 30 years, down from a 4.1 percent annual pace over the previous three decades (Exhibit 4.14).

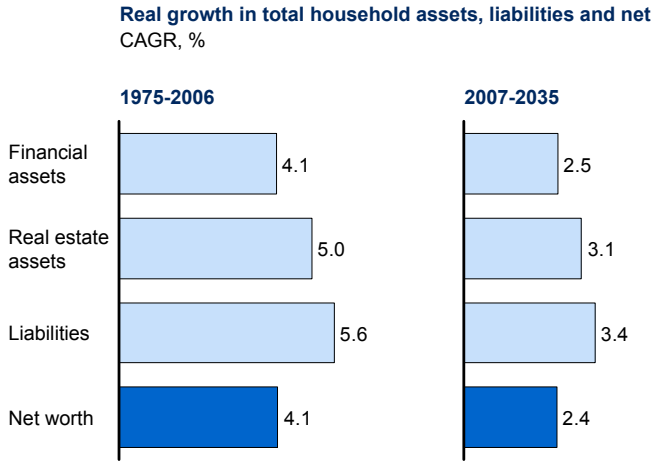
If aggregate real household net worth continued growing at its 1975–2006 pace, it would reach $118.3 trillion in 2035. Instead, at this lower pace, it will reach $75.4 trillion, a difference of $42.9 trillion. Similarly, real net worth per

2 See Appendix A for a discussion.

household in our baseline scenario reaches $489,100. It would have reached $680,000 if growth had been maintained at the earlier higher pace.[3]

Exhibit 4.14

GROWTH IN TOTAL NET WORTH HELD BY HOUSEHOLDS WILL SLOW DRAMATICALLY OVER NEXT THREE DECADES



Source: McKinsey Global Institute US Consumer Model, v7.2

ONLY A MINORITY OF BOOMERS ARE PREPARED FOR RETIREMENT

As we described in Chapters 2 and 3, households follow a life-cycle income and spending curve. A household naturally spends more as its income rises over time until retirement. During the prime spending years, many households are making mortgage payments, buying cars, and covering the multiple costs of a growing family such as food, clothes, utility bills, school supplies, college tuition, and the like. Then spending plateaus around retirement and falls after the house and cars are paid off, the children are grown, commuting costs drop, and so on. In retirement, this spending path is financed through a combination of income and wealth. The income can come from sources such as a pension, Social Security, investments, and part-time work. The household draws down wealth by selling its stocks, bonds, or other assets. Some households sell their homes and downsize to raise cash, or tap the equity through a line of credit or reverse mortgage—thereby "monetizing" their real estate by turning it into cash.

3 For an earlier discussion on the consequences of this wealth shortfall in the United States and other countries, see McKinsey Global Institute, "The Coming Demographic Deficit: How Aging Populations Will Reduce Global Savings," December 2004.

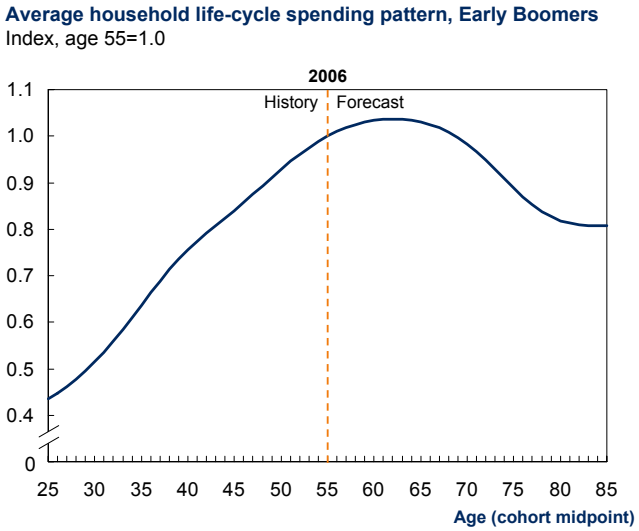
An important question for the Boomers is, given where they are on their life-cycle curve and their current level of net worth, how well prepared are they for retirement? How many households will be able to live the kind of retirement lifestyle they expect? How many will experience significant financial stress and a drop in quality of life? Recall that the distribution of both income and wealth in the Baby Boom generation is uneven (see Exhibits 2.18 and 3.24). So even though they are collectively the richest cohort in history, many Boomer households are much less prepared for retirement than others.

Defining retirement preparedness

There are many ways one can measure retirement preparedness. (See Box "How others have defined retirement preparedness.") Our approach combines the individual household information from our survey with spending predictions that reflect the underlying macroeconomic trends contained in our forecast. Our modeling of life-cycle spending patterns shows that spending roughly doubles for the average Early Boomer between the ages of 30 and 55, peaks at age 62, and then drops approximately 20 percent over the course of retirement (Exhibit 4.15). In simple terms, households that have the income and wealth to sustain such a spending pattern are considered "prepared." We'll call this "maintaining" lifestyle. Unprepared households, in contrast, will be unable to sustain approximately 80 percent of their spending as they age.

Exhibit 4.15

PREPARED BOOMERS ARE EXPECTED TO BE ABLE TO FINANCE A SPECIFIC PATTERN OF LIFE-CYCLE SPENDING

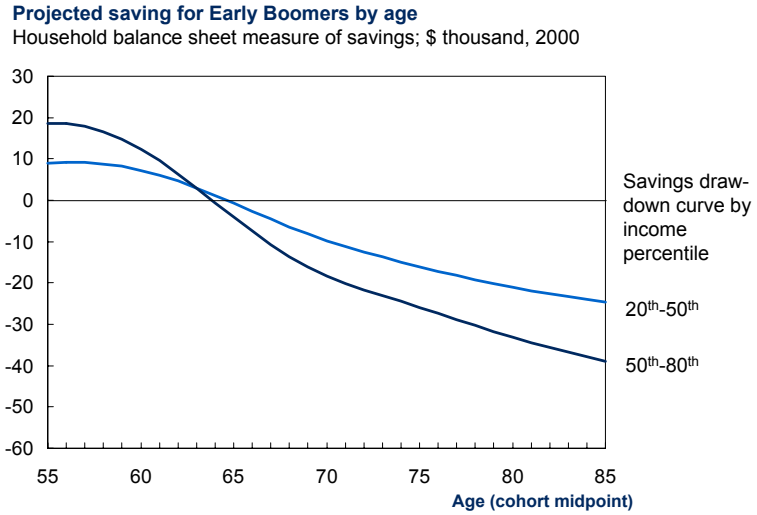


Source: McKinsey Global Institute US Consumer Model, v7.2

To determine whether Early Boomers have sufficient financial resources to maintain their standard of living, we estimated how much wealth—or net worth—they will need to finance their spending after accounting for their income.[4] As spending and income patterns are different for different levels of income, we estimate saving (and dissaving, or the use of savings for current expenses) for households in four different income percentiles.[5] For example, an average household in the 20th to 50th percentile, which had real disposable income between $30,000 and $60,000 in 2006 and was headed by a 56-year-old Boomer, is expected to draw down approximately $10,000 in assets by the time that person reaches age 70 (Exhibit 4.16). An average household in the 50th to 80th percentile with real disposable income between $60,000 and $90,000 in 2006 will draw down nearly twice that amount by the same age.

Exhibit 4.16

THE BOOMERS WILL NEED TO DRAW DOWN THEIR ASSETS TO FINANCE RETIREMENT



* Real income cutoffs for the 20th, 50th, and 80th percentiles in 2006 are approximately 30,000, 60,000, and $90,000

Source: McKinsey Global Institute US Consumer Model, v7.2

With this information, we can calculate the level of wealth needed today to maintain standards of living during retirement tomorrow.[6] By comparing these assets to disposable income, we can calculate a cutoff ratio that defines preparedness for the average household in each income group. For each household in our

4 Potential sources of income include wages and salaries, pensions, Social Security and other transfers, income from interest, and dividends and are adjusted for taxes.

5 In 2006, the 20th, 50th, and 80th percentiles correspond to approximately $30,000, $60,000, and $90,000 in real income per household.

6 This is just the present value of required savings flows.

survey, those that have a ratio at or above the cutoff are prepared (they can maintain their lifestyle), and those below the cutoff are not (Exhibit 4.17). For example, a household earning between $60,000 and $90,000 in 2006 at age 56 will need 3.8 times its income, or around $300,000, in accessible assets today to be on a prepared path to retirement.

Thus, a "prepared" household by our definition is one that faces postretirement lifestyle changes that are no worse than the average of those in its income group. That household can maintain its expected lifestyle. An "unprepared" household is one that will face a larger spending drop. This approach enables us to answer the question, "How many Boomers can maintain their lifestyle in retirement?" The answer is: not many.

Exhibit 4.17

ASSETS REQUIRED AT RETIREMENT CAN BE EXPRESSED AS A MULTIPLE OF CURRENT INCOME

Asset multiple of income for Early Boomers in 2006*
$ thousand 2000, %

Age \ Income**	<30	30-60	60-90	90+
52	3.0	2.3	2.3	3.3
56	4.5	3.8	3.8	4.5
61	6.7	5.4	5.4	5.4

* Early Boomers are between are between 52 and 61 in 2006.
** 30, 60, and 90 thousand dollars represent the approximate cutoffs for the 20th, 50th, and 80th percentiles in 2006.
Source: McKinsey Global Institute US Consumer Model, v7.2; US Aging Consumer Survey, 2007

How others have defined retirement preparedness

Over the past two decades, many researchers have focused on understanding the retirement prospects of the Boomers. This topic has been of interest not only because of concerns for the Boomers' welfare, but also because of the potential impact on public policy and the economy as a whole if a large swath of the nation's households do not have the resources to finance their own retirement.

In a recent survey, the Congressional Budget Office pointed to two factors that distinguish studies that have looked at retirement preparedness: the measure of household resources and the standards of preparedness that were used to judge if those resources are adequate.[7] The resources available to households could include financial and real estate assets (net of liabilities), retirement income such as defined benefit pensions, and government benefits such as Social Security. Studies vary in the comprehensiveness of the measures employed. Some studies, for example, define wealth more narrowly, excluding real estate wealth on the observation that most people prefer to stay in their home as long as possible rather than tap it as a source of income. Typically, resources are projected from the present until retirement, and then the estimated income that can be generated from these resources is compared against the preparedness standard.

There have been three general approaches to defining retirement preparedness. The first uses an absolute standard such as the poverty level. Households are deemed prepared if their expected income exceeds this standard during retirement. The second uses a replacement rate, defined most often as the fraction of income at retirement that is deemed necessary to maintain living standards. If households can maintain 70 to 80 percent of their preretirement income, they usually are considered prepared. Finally, some studies compare the behavior of households to the outcomes of model simulations based upon standard assumptions of economic rationality and utility maximization. In this case, a household is considered prepared if it has the resources to match the "optimal" behavior embedded in the model predictions.[8]

Our study provides an additional perspective. We capture all sources of income and net worth and utilize predicted life-cycle income, spending, and saving patterns that are linked to a fully articulated macroeconomic projection. Together, these determine retirement preparedness.

7 Congressional Budget Office, "Baby Boomers' Retirement Prospects: An Overview," November 2003. Also see Jonathan Skinner, "Are You Sure You're Saving Enough for Retirement?," *The Journal of Economic Perspectives*, vol. 21, no. 3 (Summer 2007), pp. 59–80, for a more recent overview.

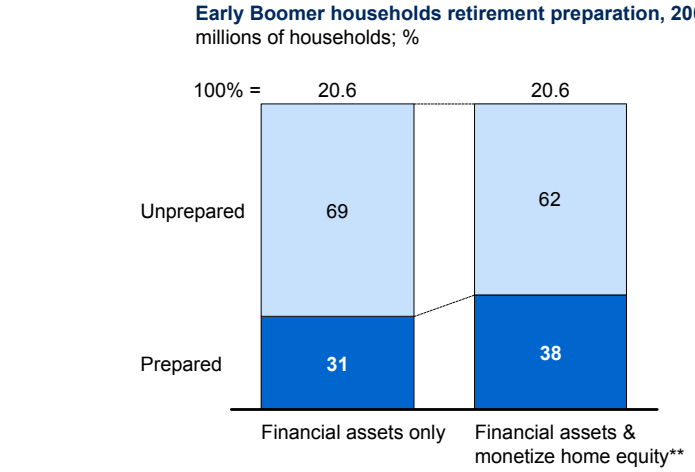
8 For representative examples of these approaches see David A. Love, Paul A. Smith, and Lucy C. McNair, "Do Households Have Enough Wealth for Retirement?," Finance and Economics Discussion Papers 2007-17, Federal Reserve Board, Washington, DC; Center for Retirement Research at Boston College, "Retirement at Risk: A New National Retirement Risk Index," 2006; John Karl Scholz, Ananth Seshadri, Surachai Khitatrakun, "Are Americans Saving 'Optimally' for Retirement?," *Journal of Political Economy*, vol. 114, no. 4 (August 2006), pp. 607-43.

Two-thirds of early Boomer households do not have the resources to maintain their living standard in retirement

In assessing Early Boomer preparedness, we look at two different measures of assets that are accessible to households. The first is net financial assets. This includes assets such as bank deposits, stocks, and bonds and subtracts credit card balances, car loans, and other nonmortgage debt. It does not include homes. The second measure assumes that a household not only taps its net financial assets, but that it monetizes the home's equity as well. Using the first measure, we find that 14.3 million Early Boomer households—69 percent—will not be able to maintain their expected lifestyle in retirement if they continue on their current course (Exhibit 4.18). That leaves less than one in three that are prepared. By the second measure, including those able to tap their home equity, we still find 12.9 million Early Boomers—62 percent—are unprepared.

Exhibit 4.18

ONLY A MINORITY OF EARLY BOOMER HOUSEHOLDS ARE PREPARED FOR RETIREMENT



* Households are considered prepared if the present discounted value of predicted saving/dissaving flows is greater than assets today.

** We assume that households can obtain 45 percent of their net equity in the form of a reverse mortgage.

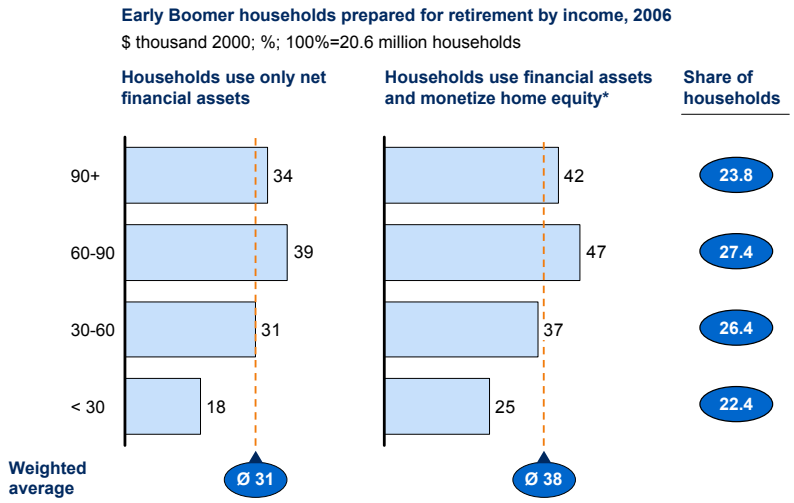
Source: McKinsey Global Institute US Consumer Model, v7.2; US Aging Consumer Survey, 2007

Interestingly, even many high-income households are unprepared for retirement (Exhibit 4.19). That is because preparedness depends on net worth relative to previous spending levels; if a high-income household has spent all its income, it is as ill-prepared as a poorer household with no savings. Also, higher income households have higher levels of spending, and therefore require more assets to maintain living standards. Thus a high-income household with low savings might experience a greater lifestyle drop on a relative basis than a poor household with

modest savings. Likewise, a low-income household that has built its savings over time may be well prepared to maintain its standard of living.

Exhibit 4.19

EVEN MANY HIGH-INCOME HOUSEHOLDS ARE UNPREPARED



* We assume that households can obtain 45 percent of their net equity in the form of a reverse mortgage.
Source: McKinsey Global Institute US Consumer Model, v7.2; US Aging Consumer Survey, 2007

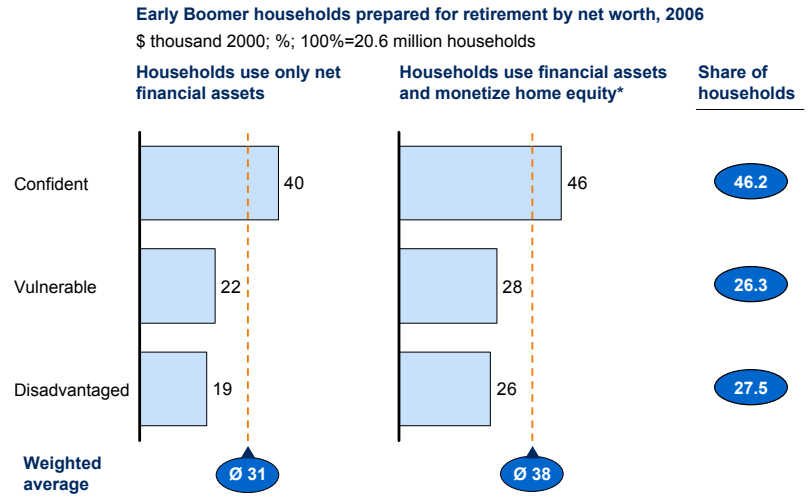
Thus we find that households earning more than $90,000 are not significantly better prepared than those earning $30,000 to $60,000. It is only when we add in household equity that the higher earners gain a slight advantage. But even by significantly tapping their home equity, fewer than half of Boomer households are prepared. It is only when we reach very wealthy households, those with net worth greater than $500,000 for Early Boomers, that we see levels of preparedness jump. For example, 75 percent of households with net worth exceeding $500,000 are prepared for retirement if we count just financial assets, and 85 percent are prepared when home equity is included.

WHAT DO BOOMERS THINK ABOUT ALL THIS?

Many Boomers seem unaware of their predicament. As described in Chapter 1, we clustered the households in our survey into those that were confident about the future, those that were feeling vulnerable, and low-income households whom we labeled economically disadvantaged. One would expect confident Boomers to be better prepared than the other two groups, and so they were (Exhibit 4.20). However, even among the confident group, less than half were financially prepared. This means that a majority of these confident, optimistic Boomers who believe they will be able to enjoy a high standard of living in retirement are in for an unpleasant surprise.

Exhibit 4.20

EVEN AMONG CONFIDENT HOUSEHOLDS LESS THAN HALF ARE PREPARED FOR RETIREMENT



* We assume that households can obtain 45 percent of their net equity in the form of a reverse mortgage.
Source: McKinsey Global Institute US Consumer Model, v7.2; US Aging Consumer Survey, 2007

Assuming they tap their home equity, the 12.9 million unprepared Early Boomer households can be divided into three groups:

- 4.2 million low-income, "disadvantaged" households that know retirement will be difficult.
- 3.9 million "vulnerable" middle- and upper-income households that are unprepared, know it, and are worried about it.
- 4.8 million "confident" middle- and upper-income households that are blissfully "unaware" of the lifestyle drop they will face as they age.

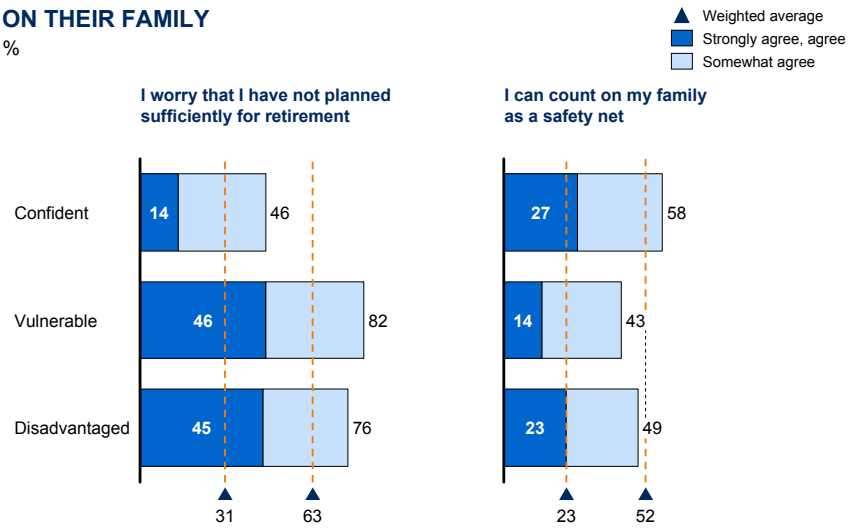
Looking at the large number of unprepared Boomers, we can see why many of them are uneasy about their financial future. Our survey found that nearly two out of three (63 percent) say they are at least somewhat worried that they have not planned sufficiently for retirement (Exhibit 4.21). Not surprisingly, the most worried are the vulnerable and disadvantaged Boomers. Almost half of them are worried. When we include those who are just somewhat worried, the shares jump to 82 percent of the vulnerable and 76 percent of the disadvantaged. Fewer than one in four Boomers believes they will be able to count on their family as a safety net.

• • •

Exhibit 4.21

VULNERABLE AND DISADVANTAGED ARE WORRIED ABOUT RETIREMENT WHILE FEW OF THE BOOMERS BELIEVE THEY CAN COUNT ON THEIR FAMILY

%



Source: US Aging Consumer Survey, 2007

Despite unprecedented opportunities and record levels of income, the Boomers' lack of savings during their prime working years, along with increased income and wealth inequality, have left most Boomer households with insufficient assets to maintain their living standards during retirement. And about a third of those households are seemingly unaware of their predicament. This creates major challenges for the Boomers as policy makers, business leaders, and individuals. Our next chapter discusses possible solutions.

5. Stairway to Heaven

Thirteen million Early Boomer households are heading toward a stark drop in living standards over the next decade, and millions more Late Boomer households will follow them, unless action is taken. Employers have not anticipated the looming loss of many experienced workers and the slowdown in the growth of the labor force. And the federal government's retirement programs, Social Security and Medicare, are financially unsustainable. But the Baby Boomers have both the resources and resourcefulness to meet these challenges. They have driven major social and economic change throughout their lives and can do so again as they approach their sunset years. The Boomers are today's business leaders and policy makers: more than 70 percent of the CEOs of top companies and state governors, 60 percent of the members of Congress, and 45 percent of registered voters are Boomers. As leaders, as policy makers, and as individuals, they have to summon the will to remove old obstacles, replace them with new inducements, and change their own behavior.

In this chapter we first examine the choices that the Early Boomers must make if they want to maintain their living standards in retirement. We conclude that increasing saving by postponing retirement and working longer is their best option, given the short time until they reach the normal retirement age. Furthermore, working longer would not only improve their retirement prospects but also benefit the rest of the economy. The Late Boomers have more time, and even though working longer will be the most important lever for them as well, modest reductions in spending could also improve their retirement preparedness.

Next we look at the current policy debate and highlight a set of proposals that together would have the greatest impact on helping the Boomers save more by both working longer and spending less. The top three issues we identified are:

- Reallocating health care insurance for older workers to realign incentives in a way that encourages businesses to employ them
- Enabling businesses to offer flexible work arrangements that help mature employees extend their careers
- Reforming private pensions and Social Security to remove disincentives to working longer

The unprepared Early Boomers, aged 54 to 63 today, will have to rely primarily on working longer to improve their finances. But the Late Boomers, aged 44 to 53, have more time to also boost savings by trimming their spending. They should do so, but they need help. Lawmakers should reform and simplify the tax code to increase incentives to save.

By looking at the debate through this lens, our objective is to raise the plight of mature workers higher on the national agenda and to provide a sense of urgency required to solve these broader problems before the bulk of the Boomers retire.

THE PATH TO PREPAREDNESS

The Boomers still have time to ready themselves for retirement by saving more. But doing so will not be painless. Those who are ill-prepared for retirement face some hard choices: They will have to keep working longer than they had planned, spend less, or do both. We find that postponing retirement will be the better course for many Boomers by sparing them a drastic cut in spending while also providing a bit of extra stimulus to a slowing economy.

Working longer can have a dramatic impact on the number of prepared households

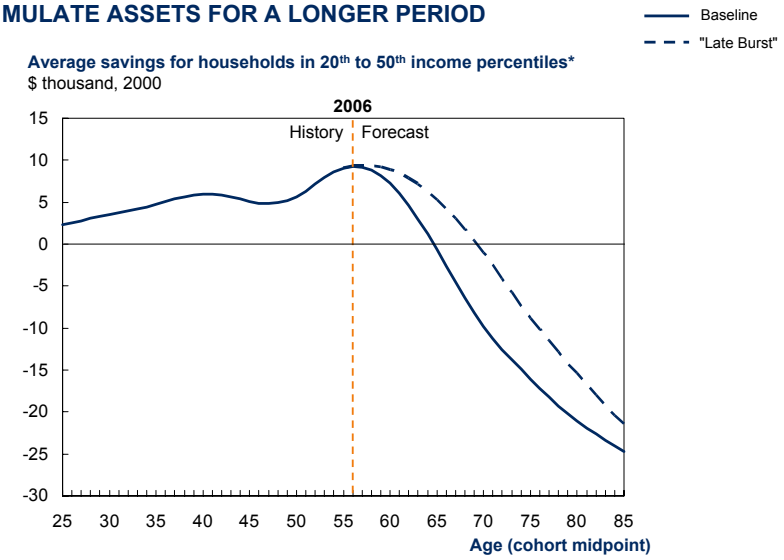
If the Boomers stay on their current savings path, we project that Early Boomers will begin drawing down their savings at an average age of 65. But they could choose another path. They could postpone retirement, keep working, and use the additional income to increase their assets. By working longer, the Early Boomers would begin drawing down their assets later, at an average age of 70 instead of 65 (Exhibit 5.1).

Such an additional accumulation of savings would have a significant impact on the shares of prepared and unprepared households. If Early Boomers were to

draw down only their net financial assets, the share of prepared households almost doubles from 31 to 60 percent; if households also tap their home equity, the share of prepared households rises even more, from 38 to 69 percent (Exhibit 5.2).

Exhibit 5.1

SAVINGS PATH IF EARLY BOOMERS CONTINUE TO ACCUMULATE ASSETS FOR A LONGER PERIOD

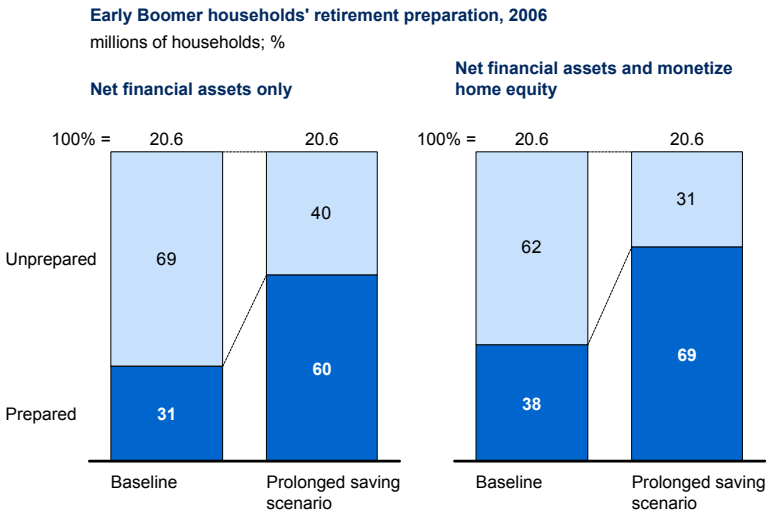


* Household balance sheet definition of savings (see Appendix B).

Source: McKinsey Global Institute US Consumer Model, v7.2; US Aging Consumer Survey, 2007

Exhibit 5.2

PROLONGING SAVING HAS A DRAMATIC IMPACT ON THE NUMBER OF BOOMERS WHO CAN MAINTAIN THEIR LIVING STANDARDS



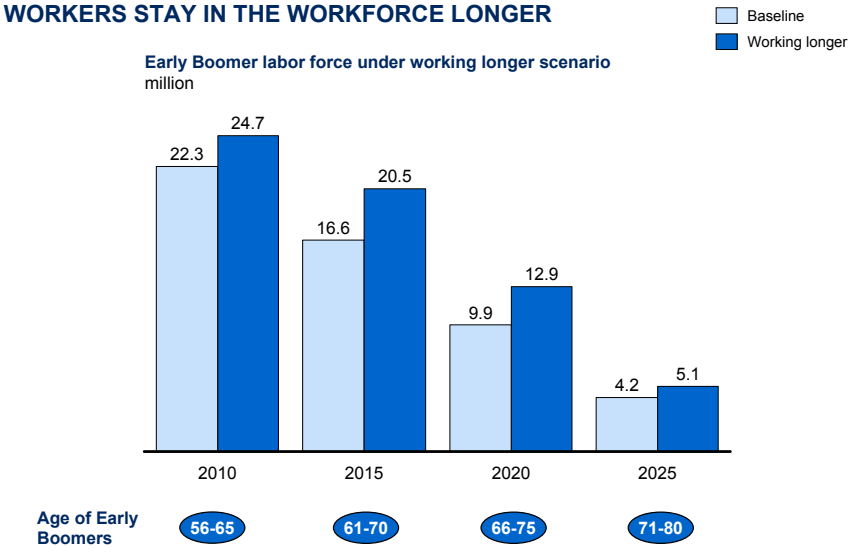
Source: McKinsey Global Institute US Consumer Model, v7.2; US Aging Consumer Survey, 2007

Alternatively, Boomers could raise their savings by cutting spending, a scenario we also considered. Individual households might ultimately choose some combination of working longer and cutting spending. Our analysis shows that working longer is the better option for both the Boomers and the rest of society.

If the Early Boomers—aged 54 to 63 in 2008—continue to work so that on average they accumulate assets for five years longer than in our baseline projection, 4 million more Boomers would be working in 2018 than in the base case. All of these Early Boomers would be 64 or older at that time (Exhibit 5.3). This extra work would drive the Early Boomers' median retirement age up from 62.6 in the base case to 64.1—an increase of about two years—by 2015. That may not sound like much, but by historical norms it would be a significant change—recall that it took three decades, from 1970 to 2000, for the national retirement age to decline by about two years (see Exhibit 4.6).

Exhibit 5.3

THE MEDIAN RETIREMENT AGE RISES FROM 62 TO 64 AS OLDER WORKERS STAY IN THE WORKFORCE LONGER



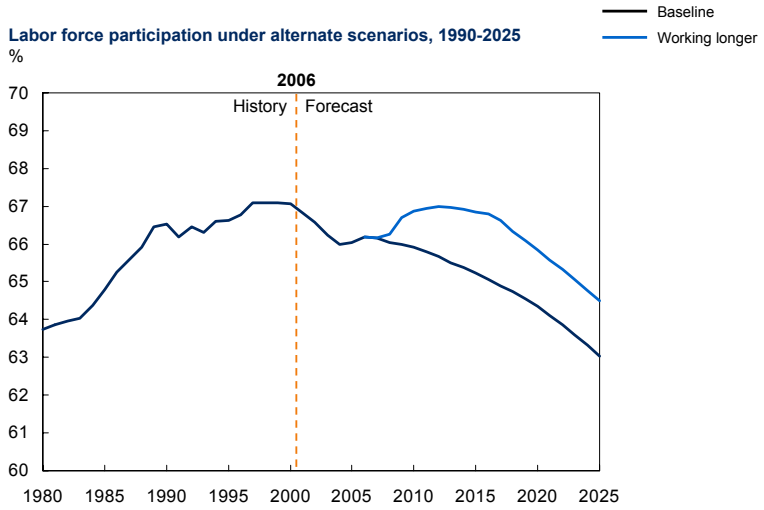
Source: McKinsey Global Institute US Consumer Model, v7.2

Of course, this does not mean all Boomers would have to work beyond age 64. Some would still retire before then, but enough Boomers would work longer to move the median higher. With more Early Boomers staying in the workforce, the national labor force participation rate would rise sharply to levels similar to the average from 1988 through 2005 (Exhibit 5.4). Because such shifts would be the result of decisions by millions of individual Boomers, they could happen in a variety of ways. The mix of full-time and part-time jobs could stay essentially the

same, with the median retirement age shifting out nearly two years. Or it could be that many Boomers would delay retirement by shifting to part-time jobs, or they might retire formally from one job and then "work in retirement" part-time.[1]

Exhibit 5.4

AS BOOMERS REMAIN IN THE WORKFORCE, LABOR FORCE PARTICIPATION RISES TO LEVELS SIMILAR TO THOSE IN THE 1990s



Source: McKinsey Global Institute US Consumer Model, v7.2

Those on the cusp of preparedness—middle-class households with assets of $100,000 to $500,000—gain the most from additional savings. For example, if households use their financial assets and home equity, the total number of prepared households increases by 6.4 million. More than half this increase, 3.7 million, comes from households in this middle group. The extra saving also benefits those with few assets: The number of prepared households with under $100,000 in assets today would increase by 2 million under this saving scenario, although two-thirds of these households are still unprepared (Exhibit 5.5).

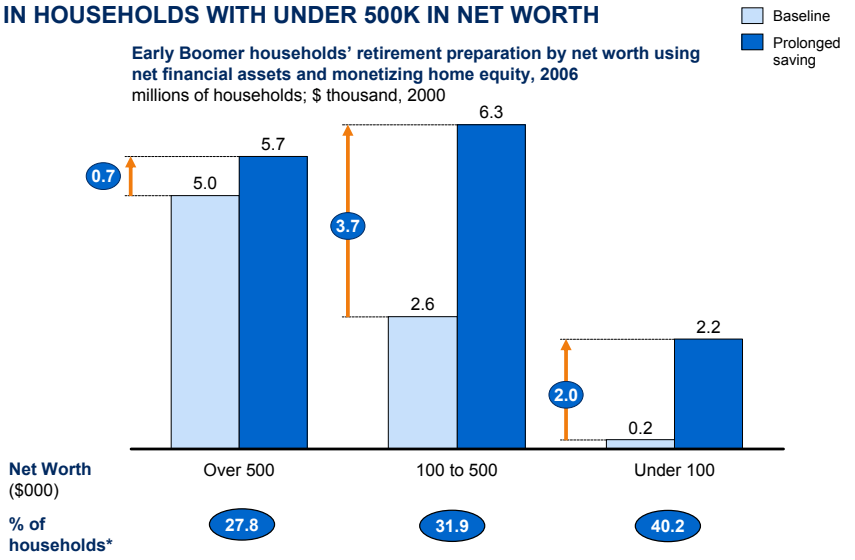
We also see the limits of extra savings at lower income levels. A period of prolonged savings will mean that the number of prepared households earning $30,000 a year or less will increase by 800,000. In contrast, for households earning $90,000 or more, the number of prepared households will increase by 2.4 million (Exhibit 5.6). Extra savings are a big help in any case, but extra savings alone will not be enough to lift many lower income households into the ranks of the prepared. Fully three-quarters of them will not be able to maintain their living

1 The rate does not reflect the mix of part-time and full-time workers; anyone who has a job or is seeking one is counted as participating in the labor force.

Exhibit 5.5

THE GAINS FROM A PROLONGED SAVING WOULD BE CONCENTRATED IN HOUSEHOLDS WITH UNDER 500K IN NET WORTH

Early Boomer households' retirement preparation by net worth using net financial assets and monetizing home equity, 2006
millions of households; $ thousand, 2000



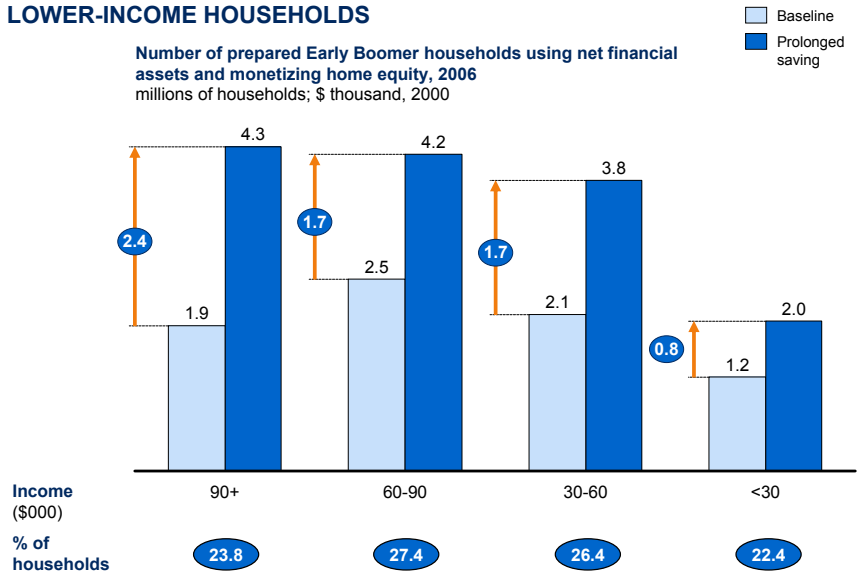
* Figures may not sum due to rounding.

Source: McKinsey Global Institute US Consumer Model, v7.2; US Aging Consumer Survey, 2007

Exhibit 5.6

PROLONGED SAVING HAS A LIMITED IMPACT ON LOWER-INCOME HOUSEHOLDS

Number of prepared Early Boomer households using net financial assets and monetizing home equity, 2006
millions of households; $ thousand, 2000



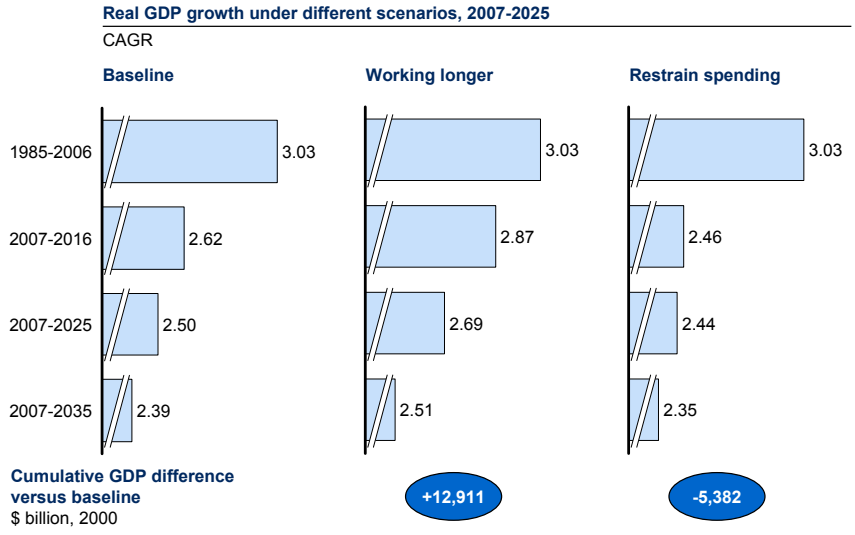
Source: McKinsey Global Institute US Consumer Model, v7.2; US Aging Consumer Survey, 2007

standards even if they save more. Overall, a late burst of savings would most benefit middle- to upper-income households with relatively low current net worth.

Working longer will also have a beneficial impact on the rest of the economy. Higher labor participation would significantly boost overall growth, enabling the economy to generate $12.9 trillion more GDP between now and 2025 than would occur under the baseline forecast (Exhibit 5.7). Job creation would be stronger, and aging consumers would spend more on domestically produced services such as medical care, helping further narrow the trade deficit relative to the baseline.[2] Household savings would rise by more than $400 billion, increasing the overall saving rate to 5.4 percent by 2022, a jump of three percentage points (Exhibit 5.8).[3] Furthermore, by working longer, the Boomers would pay more taxes than otherwise and could more easily delay their drawdown of government retirement benefits, helping ease the impact of their aging on both Social Security and Medicare.[4]

Exhibit 5.7

EXTENDING CAREERS IS THE BEST OPTION BECAUSE OF WIDER SPILLOVERS IN THE ECONOMY



Source: McKinsey Global Institute US Consumer Model, v7.2

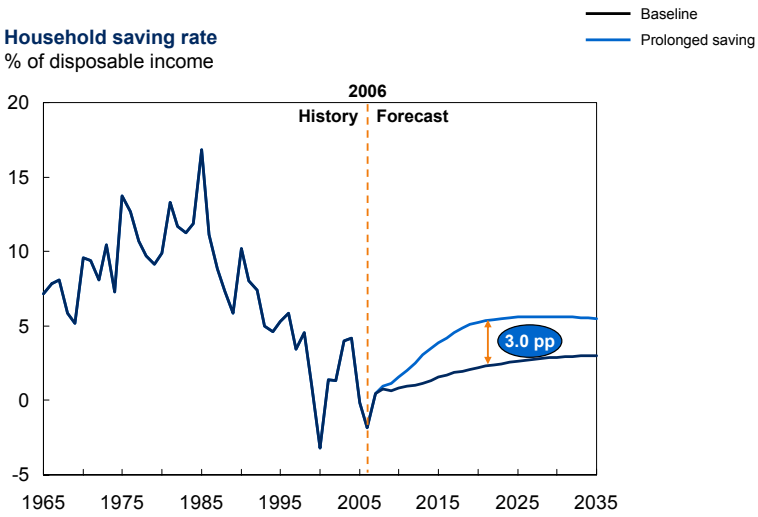
2 See Appendix A for a description of our macroeconomic scenarios.

3 Saving rates remain elevated under the alternative because we assume that the Late Boomers and subsequent cohort follow the lead of the Early Boomers and also save more. Indeed, the Late Boomers are in the same predicament as their predecessors and will need to make similar adjustments. Their advantage is they have more time, and thus can make smaller adjustments to meet the same goals.

4 For example, Barbara A. Butrica, Karen E. Smith, and C. Eugene Steuerle of the Urban Institute estimate (in "Working for a Good Retirement," The Retirement Project, Discussion Paper 06-03, p. 16) that if everyone worked five years longer, Social Security's deficit would be cut by 29 percent.

Exhibit 5.8

PROLONGED SAVING BY EARLY BOOMERS INCREASES US AGGREGATE SAVINGS RATE BY 3 PERCENTAGE POINTS BY 2022



Source: McKinsey Global Institute US Consumer Model, v7.2

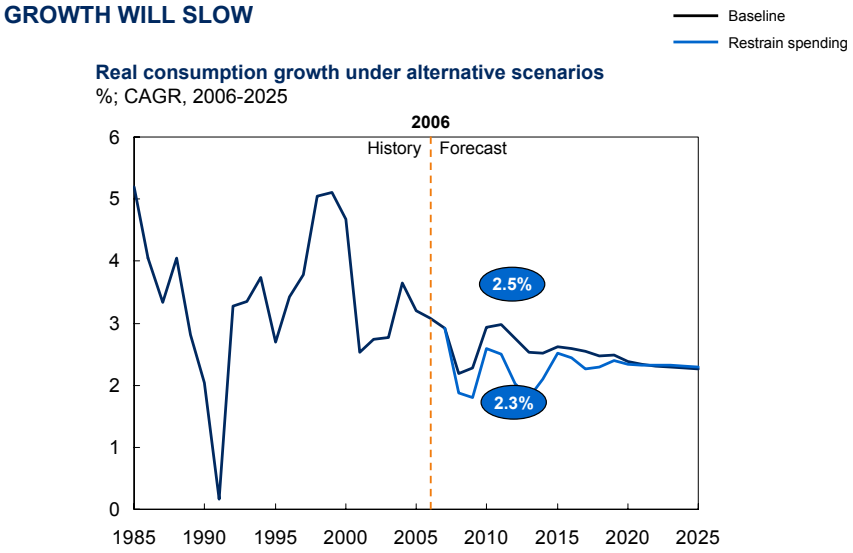
It is also possible that the process of enabling the Boomers to work longer could fuel better productivity growth than we are assuming. Other MGI research has shown that productivity growth and job creation often flow together from labor market innovation and flexibility. And a slowdown in labor force growth might prompt business to boost capital investment.

Of course, many Boomers do not want to postpone retirement. So we also examined a scenario in which the Early Boomers save more by spending less rather than by working longer (Exhibit 5.9). In the first five years of the forecast, this implies that the average Early Boomer would cut spending by less than 5 percent from the baseline. The drop over the subsequent five years would be more substantial—an average 15 percent decline from the baseline. This second five-year period, from 2012 to 2017, is critical. It occurs just as most Early Boomers will be easing into retirement and would represent a sharp, probably unexpected, and certainly undesirable, decline in living standards for these retirees.

This choice would have a dampening effect on the US economy (see Exhibit 5.7) in the short and medium term. While working longer stimulates economic growth, spending less does the opposite. The spending reduction in our scenario would lower GDP growth by 0.2 percentage points from 2007 to 2017—resulting in $5.4 trillion less in GDP by 2025.

Exhibit 5.9

AS BOOMERS REDUCE SPENDING, ECONOMY-WIDE CONSUMPTION GROWTH WILL SLOW



Source: McKinsey Global Institute US Consumer Model, v7.2

But key questions remain: Are the Early Boomers willing and able to work? And will employers give them the job opportunities and flexibility they desire? Are they willing to adjust their spending patterns? What combination of increased saving and longer working lives will the Late Boomers choose? How can business leaders and policy makers create incentives to help the Boomers make the best decisions?

ENABLING BOOMERS TO WORK LONGER

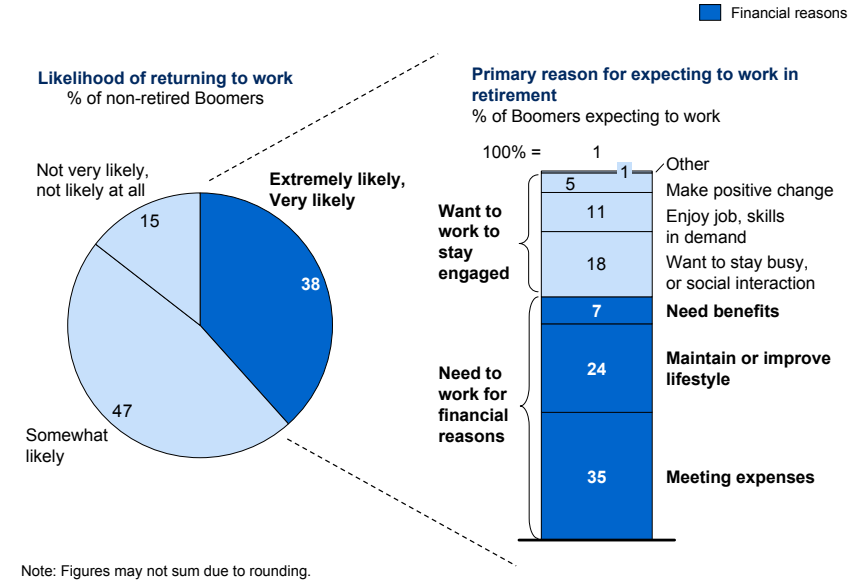
In their prime, the Boomers worked more than previous generations, and they will need to do so again in their later years. Many Boomers say they plan to keep working. In our survey we asked non-retired Boomers about their plans and found that nearly two in five (38 percent) said it is very likely or extremely likely that they will work in retirement, and an additional 47 percent said it was somewhat likely (Exhibit 5.10). Two-thirds of those expecting to work in retirement cited financial needs as their primary reason for working. An additional 18 percent said they would work to stay busy or for the social interaction of the workplace, and 11 percent said they enjoy their jobs and their skills are in demand.

To work longer in life, the Boomers will need to overcome challenges that mature workers have always faced, such as the difficulty in switching jobs at older ages. And policy makers and business leaders will need to develop the right incentives

that encourage and reward longer working lives. We will consider these issues in the remainder of the chapter and highlight how policies that could promote longer working lives fit into the broader policy debate.

Exhibit 5.10

FINANCIAL NEEDS ARE PRIMARY REASONS FOR WORKING LONGER



Note: Figures may not sum due to rounding.
Source: US Aging Consumer Survey, 2007

Before turning to that discussion, it is interesting to point out that other countries have faced these problems and risen to the challenge. In Finland, the government, businesses, and labor groups have worked together over the past decade on a national initiative that has boosted the nation's retirement age by almost four years, to 60.5 years.[5] The employment rate for workers aged 55 to 64 has climbed from 36 percent in 1997 to 59 percent now—the highest rate within the European Union. One significant change was raising from 59 to 63 the minimum age at which retirees can receive their government-provided pension.

The initiative in Finland also aimed to promote a more positive image of older workers, change company practices, and encourage mature workers to postpone retirement. One lock manufacturer, Abloy Oy, provides an example of how this was accomplished. The company gives workers progressively more time off after age 58 in hopes the extra rest will reduce fatigue and sick days. All its workers aged 55 and older are entitled to an assortment of extra benefits, such as free

5 Mary Young with Diane Pikatialis and Anna Rappaport, "Gray Skies, Silver Linings: How Companies are Forecasting, Managing, and Recruiting a Mature Workforce," The Conference Board, December 2007.

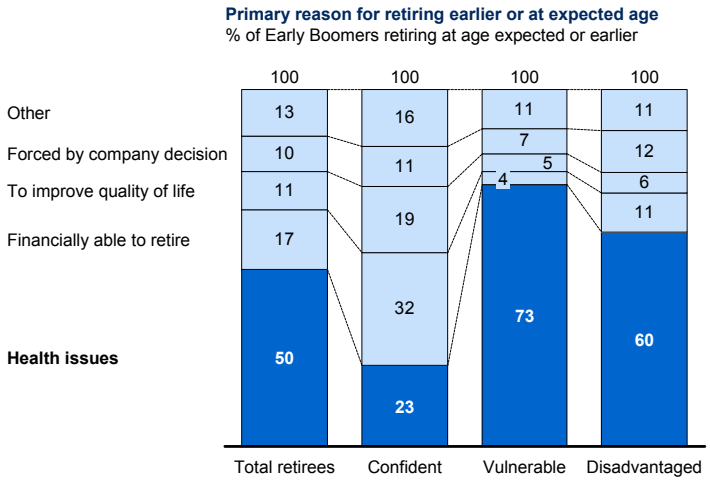
membership in a special fitness club for older people. The company trained younger managers to better understand the needs of older workers. And the company adopted a policy of "age management," the idea that managers should adjust the jobs to fit the changing abilities of aging workers, rather than insist that older worker meet the demands of existing jobs.

Boomers' challenges to working longer

Of course, some of those who want or need to work will face difficulties. First, some Boomers will be unable to work longer because of health issues. Our survey found that half of the Boomers who have retired early have done so for health reasons. A significant majority of those who retired for health reasons are in vulnerable and disadvantaged households—precisely those who most need to keep working (Exhibit 5.11).

Exhibit 5.11

VULNERABLE AND DISADVANTAGED BOOMERS WERE FAR MORE LIKELY TO RETIRE EARLY FOR HEALTH REASONS
Retired Early Boomers



Note: Figures may not sum due to rounding.
Source: US Aging Consumer Survey, 2007

Second, those who are healthy and willing to work will face other challenges. Older workers have a harder time finding new jobs than younger workers. One study found that two years after an involuntary job loss at age 55, just 60 percent of men and 55 percent of women were employed, compared with more than 80 percent of all those who were working at age 55 and did not lose their jobs.[6] Even four years after a job loss, displaced workers were 20 percent less likely

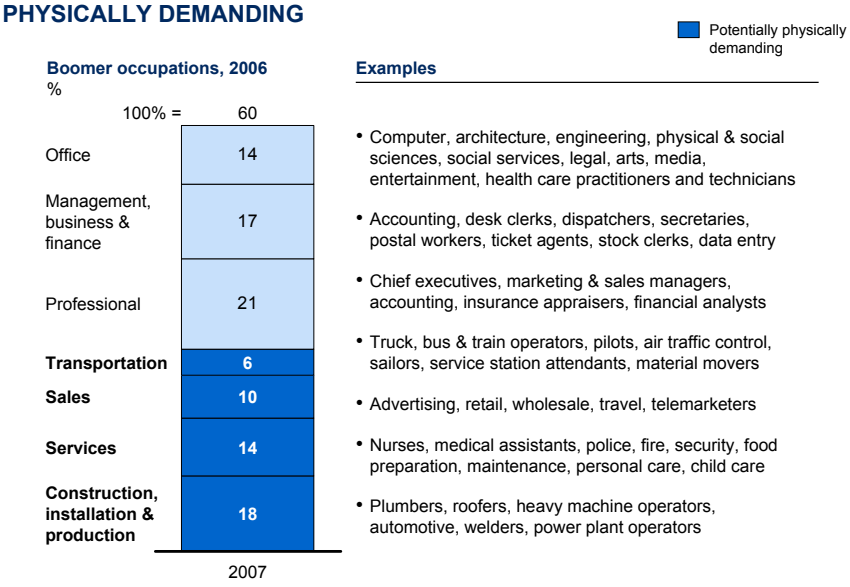
6 Sewin Chan and Ann Huff Stevens, "Job Loss and Employment Patterns of Older Workers," *Journal of Labor Economics,* vol. 19, no. 2 (April 2001), pp. 518-19.

to be employed than those who had not lost their jobs. This difference reflected several factors: Some workers sought but failed to find new employment; some found new jobs but left them soon thereafter, either voluntarily or involuntarily; and some chose to retire from the labor force.

Finally, some workers are in physically demanding occupations that make it difficult to continue working later in life. Even though a slight majority of Boomers work in knowledge-oriented occupations, nearly half work in occupations that can be physically demanding, such as construction, production, transportation, and some service jobs (Exhibit 5.12). Many of these occupations have lower compensation than knowledge-based jobs, which means these workers are also at higher risk of being financially unprepared for retirement.

Exhibit 5.12

NEARLY HALF OF BOOMERS WORK IN OCCUPATIONS THAT CAN BE PHYSICALLY DEMANDING



Source: Bureau of Labor Statistics Occupational Employment Statistics; McKinsey Global Institute US Consumer Model, v7.2

Clearly, working longer will not be enough to ensure that all unprepared Boomers can maintain their living standards in retirement. Many Boomers will rely on Social Security and Medicare in their senior years. Policy makers will have to find ways to sustain these programs, at least for the most disadvantaged households.

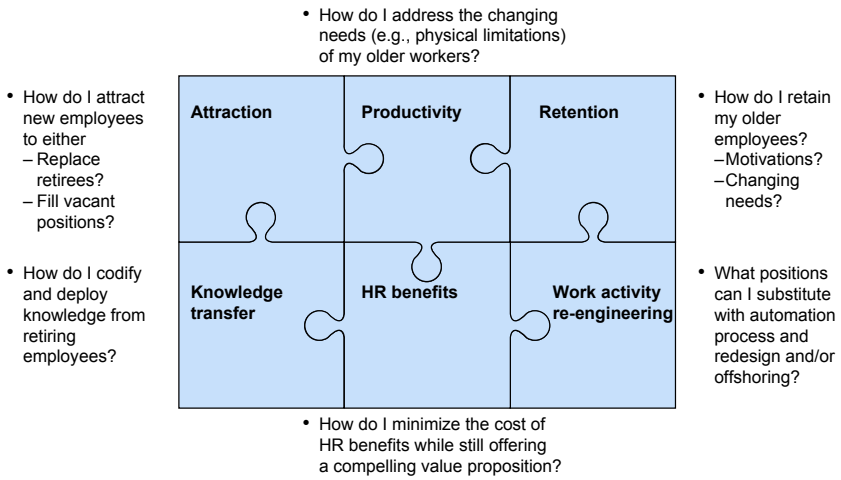
Businesses' challenges to employing older workers

Employers also face challenges to promote extended working lives. They will need to develop an integrated strategy to cope with their aging workforce (Exhibit 5.13). They will need to weigh the costs of retaining mature workers against

the costs of recruiting and retaining new talent, and of losing older workers' knowledge and experience. They will also need to consider the changing needs and potential physical limitations of older workers, re-engineer work activities, and develop human policies appropriate for an aging workforce.

Exhibit 5.13

DESIGNING AN AGING STRATEGY CONSISTS OF MANY INTEGRATED COMPONENTS



Source: McKinsey Organization Design Practice

The vast majority of business executives recognize that shifting demographics will have a major impact on their businesses in the coming decade, and that older workers have valuable knowledge and experience. However, only a small minority of executives have formal programs to retain the knowledge of departing workers or to encourage workers approaching retirement to continue working. For that matter, even fewer believe that their company is "very" committed to retaining employees approaching retirement (Exhibit 5.14). Starting the conversation matters: More than 80 percent of businesses surveyed have not asked their mature workers about their future work preferences or intentions.[7]

Implications for business leaders and policy makers

Despite these challenges, the total cost to society will be smaller if more Boomer households can work longer, continuing to earn income, pay taxes, and contribute to economic growth. Otherwise, many older workers who do not find employment will fall back on costly public assistance, including food stamps, public housing, and Social Security disability insurance, or be forced to make significant cuts in

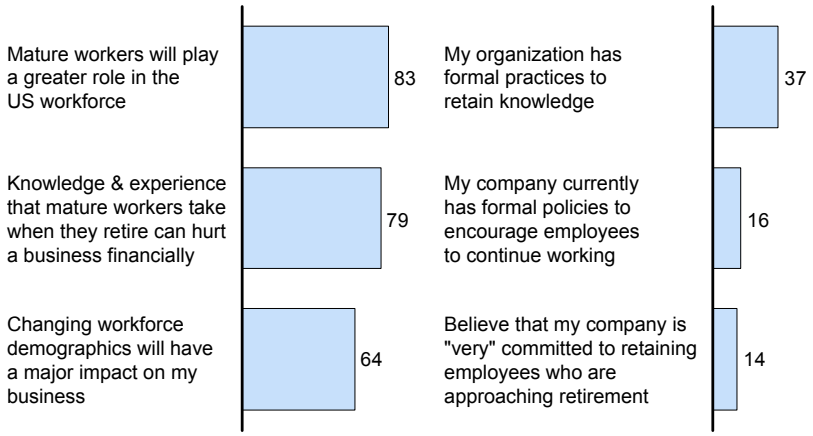
7 Buck Consultants, "The Real Talent Debate: Will Aging Boomers Deplete the Workforce?", 2006, p.2.

their standard of living. We believe that policy makers in business and government must address three sets of issues to enable Boomers to work longer. They should:

- Devise solutions to reduce employment costs, particularly for health care insurance
- Develop flexible approaches to work that cut through legal and regulatory barriers and reset employers' perceptions about older workers' capabilities
- Reform private pensions and Social Security to remove disincentives to working longer

Exhibit 5.14

BUSINESS EXECUTIVES AGREE THAT OLDER WORKERS WILL HAVE AN INCREASING IMPACT BUT ARE NOT PREPARED FOR THE TRANSITION
Percent of executives "strongly" or "somewhat" agree



Source: AARP, "Business Executives' Attitudes Toward the Aging Workforce: Aware But Not Prepared?" 2006

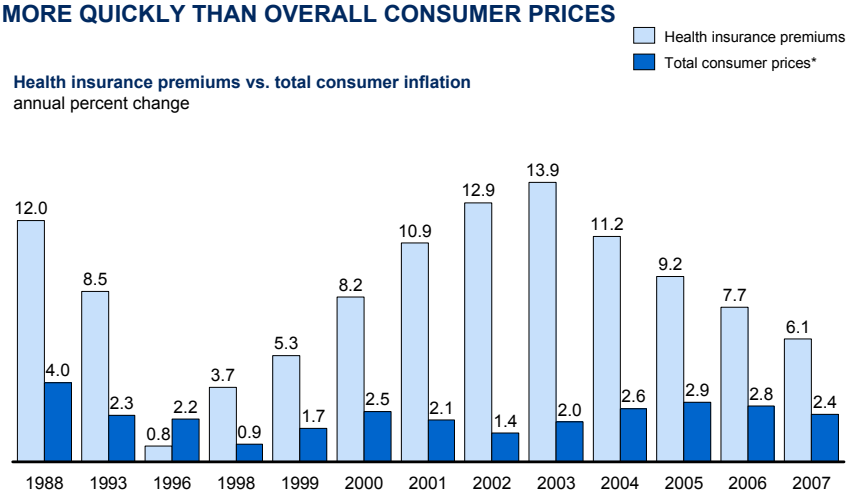
Control health costs

Reallocate health care insurance costs for older workers. Health insurance premiums have been rising significantly faster than inflation for two decades (Exhibit 5.15). Despite rising prices, the use of health care has been increasing rapidly: Real health care spending has been responsible for 20 percent of overall real spending growth since 1985, which is one-third more than during the previous two decades (see Exhibit 3.5). There is growing consensus that the explosion in health care spending is not sustainable. For example, the Congressional Budget Office is bluntly warning that recent spending increases in Medicare and Medicaid cannot continue.[8]

8 See www.cbo.gov/publications/collections/health.cfm

Exhibit 5.15

HEALTH INSURANCE PREMIUMS HAVE BEEN RISING DRAMATICALLY, MORE QUICKLY THAN OVERALL CONSUMER PRICES



* Personal consumption price deflator.

Source: American Hospital Association; BEA; The Kaiser Family Foundation and Health Research and Educational Trust; Employer Health Benefits: 1998-2007; KPMG Survey of Employer-Sponsored Health Benefits: 1988, 1993, 1996

With this background, the current national health care debate has focused primarily on how to control rising overall costs and how to provide coverage to the uninsured. Our objective is not to offer solutions to the broader problem, but instead to highlight some issues that are being lost in the debate. These will be critical to get right if any reform effort is to succeed while simultaneously helping solve the retirement predicament faced by many Boomer households.

One issue that has received little, if any, attention is the cost of employer-provided health insurance for mature workers. Another issue is how the current system creates disincentives to working longer in life.

Rapidly rising costs have caused many businesses to scale back or eliminate health care coverage for their employees. Higher premiums and other employee costs have caused many workers to drop their coverage (Exhibit 5.16). Secular shifts in occupations, increases in part-time and contingent work, and the decline of union jobs have also contributed to the fall in employer-provided health care coverage.[9]

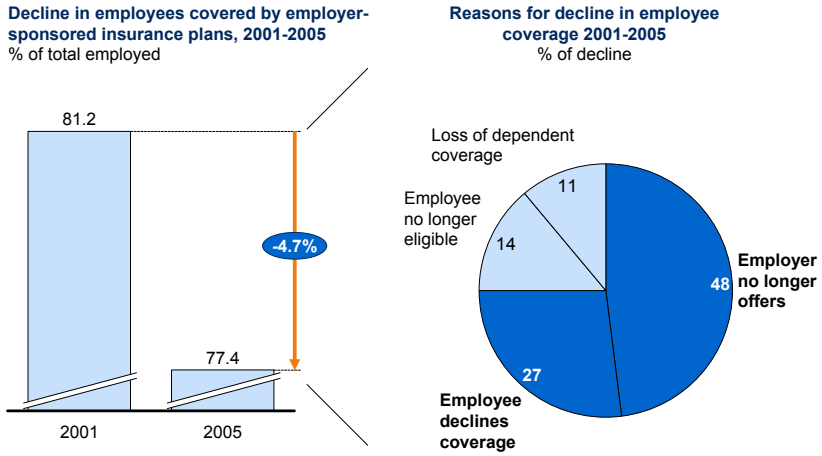
Households in their fifties and sixties spend nearly twice as much on medical services as households in their thirties and forties. Because approximately 85

9 Lisa Clemans-Cope and Bowen Garrett, "Changes in Employer-Sponsored Health Insurance Sponsorship, Eligibility, and Participation: 2001 to 2005," Kaiser Commission on Medicaid and the Uninsured, December 2006.

percent of this spending is covered by health insurance, climbing costs create a disincentive to retain or hire older workers (Exhibit 5.17). The overwhelming health care liabilities of some US automakers are only the starkest examples of the impact of rising health costs.

Exhibit 5.16

RISING COSTS HAVE CONTRIBUTED SIGNIFICANTLY TO FALLOFF IN EMPLOYER-SPONSORED HEALTH CARE AND EMPLOYEE TAKE-UP RATE



Source: Kaiser Family Foundation, "Changes in Employer-Sponsored Health Insurance Sponsorship, Eligibility, and Participation: 2001 to 2005," December 2006

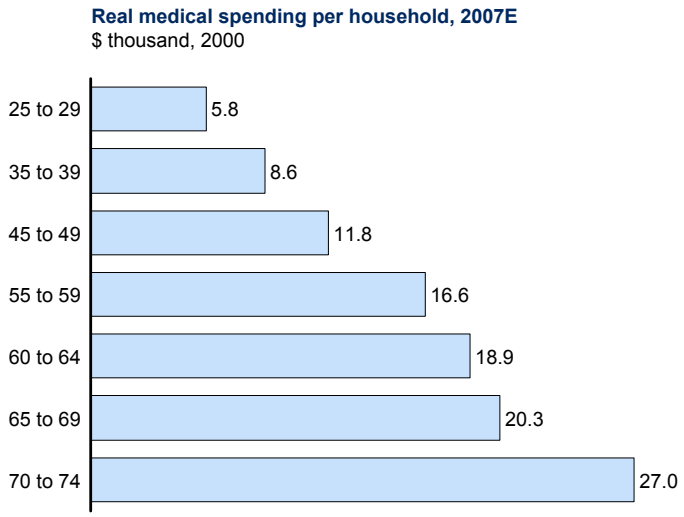
The incentives become more complicated when workers reach age 65 and their health care costs are the highest. Unlike retirees, who are covered by Medicare once they reach this age, workers 65 and older do not receive Medicare benefits if their employer provides health insurance.[10] In this case, the employer's health plan is the primary payer of health costs, and Medicare provides secondary coverage for services only if they are not covered by the employer plan. In practice, Medicare pays little or none of the health costs of such workers.

From the perspective of a worker 65 or older, this differential treatment can be thought of as an implicit tax: The wages received are lower because the employer must pay for the cost of health insurance. To the extent that wages are lower (while benefits do not appear to be increasing), this creates less incentive to work. From the perspective of an employer, this represents a direct cost that would otherwise not be incurred. To the extent that the employer must bear this cost, this creates a disincentive to hire and retain older workers.

10 This rule applies for businesses with 20 or more workers.

Exhibit 5.17

MEDICAL EXPENDITURES INCREASE RAPIDLY WITH AGE



Source: McKinsey Global Institute US Consumer Model, v7.2

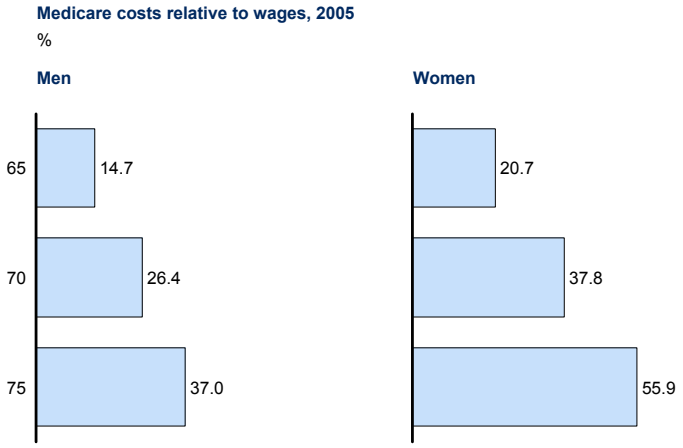
Regardless of who bears the full cost, the impact of this policy can be measured by considering average Medicare expenditures by age relative to wages.[11] The costs are substantial. In 2005, Medicare costs were equivalent to approximately 15 percent of wages for men aged 65. They were nearly twice as high for those aged 70, and rose to 37 percent by age 75. The pattern for women is similar, although the implicit rates are higher because women on average have lower wages even though they have lower health care costs (Exhibit 5.18).

The issue of providing insurance for workers 65 and older raises many of the same questions being discussed in the debate over how to provide coverage to the uninsured—how to divide health care costs among businesses, government, and individuals. A range of approaches has been considered. One would be to keep the current system but to have the federal government bear more of the cost by providing tax breaks or other subsidies to help businesses provide coverage to older workers. Another option would be to abandon the system of employer-provided health insurance and allow or require individuals of all ages to buy their own coverage in the private market. The costs could be mitigated by creating pools of buyers to negotiate terms or by the government's subsidizing the purchases in various ways.

11 See Gopi Shah Goda, John B. Shoven, and Sita Nataraj Slavov, "A Tax on Work for the Elderly: Medicare as a Secondary Payer," NBER Working Paper 13383, August 2007.

Exhibit 5.18

MEDICARE COSTS ARE EQUIVALENT TO A LARGE SHARE OF WAGES FOR OLDER WORKERS



Source: Gopi Shah Goda, John B. Shoven, and Sita Nataraj Slavov, "A Tax on Work for the Elderly: Medicare as a Secondary Payer," NBER Working Paper 13383, August 2007

Alternatively, the government could take a bigger role by returning to the pre-1983 policy by making Medicare the primary payer of health care costs for eligible beneficiaries over age 65, whether they are working or not. This would increase the costs to taxpayers of financing Medicare, which is already underfunded.[12] However, to the extent that more older workers remain employed, the added tax revenue could at least partly offset increases in Medicare costs.[13] More older workers might end up with jobs either because a substantial drop in hiring costs makes them more attractive, or because businesses provide higher wages inducing more to work. Furthermore, as we have seen in our analysis of retirement preparedness, a large number of Boomers need to work to maintain living standards. They would gain from a policy shift that made it easier for them to get jobs.

Flexible work arrangements

Businesses should offer more flexible work arrangements. The labor market will have to continue evolving to accommodate the nation's aging workforce. For instance, labor rules developed to ensure equity in the past may have to

12 The 2008 Annual Report of the Boards of Trustees of the Federal Hospital Insurance and Federal Supplementary Medical Insurance Trust Funds, pp. 2-4.

13 Goda, Shoven, Slavov, 2007, *op. cit.*

be reconsidered if they limit workplace flexibility in the future. Many Americans say they are willing to keep working if they can do so part-time, or work from home, or with a gradual reduction in hours and pay, or on contract. One arrangement gaining popularity is "phased retirement"—allowing employees a gradual withdrawal from the workplace rather than the abrupt exit associated with traditional retirement. This approach would help older workers stay on the job longer without leaving their current employer and finding a new job. Nearly two in five (38 percent) current workers aged 50 or more expressed interest in phased-retirement programs, according to a recent survey, and 78 percent said these programs would encourage them to stay in the labor force longer.[14] Starting phased retirement early was appealing to many: 29 percent expressed a desire to do so before age 60, while nearly half (46 percent) reported that they would like to start phased retirement between the ages of 60 and 64.

In general, businesses appear willing to consider phased-retirement options as well. In a study of policies toward white-collar workers in both large and small business establishments, almost three-fourths (73 percent) of the businesses indicated they would permit phased retirement if an older employee requested a shift to part-time employment.[15] However, only 23 percent reported having a formal phased-retirement policy that applies to all employees. Businesses may have offered such arrangements to select employees on an ad hoc basis in the past, but this approach will not suffice to handle the coming generational shift.

Even though phased retirement appears attractive, fewer than 10 percent of workers typically take this option. And blue-collar workers have lower rates of participation than white-collar workers. Furthermore, individuals appear just as likely to change employers when they move to a part-time schedule as stay with their current employer.[16]

These programs are already widespread in government and in educational institutions. For example, many public employers (especially in education) have adopted Deferred Retirement Option Plans. DROPs allow workers to continue working beyond retirement age, but with the provision that the benefits they

14 S. Kathi Brown, "Attitudes of Individuals 50 and Older Toward Phased Retirement," AARP, March 2005.

15 Robert Hutchens, "The Cornell Study of Employer Phased Retirement Policies: A Report on Key Findings," Ithaca, New York: School of Industrial and Labor Relations, Cornell University, October 2003.

16 Hutchens, "Phased Retirement: Problems and Prospects," Center for Retirement Research, Work Opportunities for Older Americans, Series 8, February 2007; William E. Even and David A. Macpherson, "Do Pensions Impede Phased Retirement?" IZA DP 1353, October 2004.

would have collected are set aside in a special fund to be paid to them in a lump sum when they retire. DROPs have been used for some 20 years.

Government should consider clarifying the law to encourage businesses to offer flexible arrangements. So why haven't businesses adopted these programs? Some experts believe that formal phased-retirement plans will not become routine without specific amendments to the US tax code, the Employee Retirement Income Security Act (ERISA), and the Age Discrimination in Employment Act.[17] Each of these has features that potentially conflict with the objectives of phased-retirement programs. Such reforms would help set the stage for businesses to design programs that do not disrupt business processes. These measures would also provide the information that employees need to make better informed choices.

A resolution of the health insurance problems discussed previously will also be necessary if phased-retirement programs will be successful for employers and employees. Of the employers who said they would consider phased retirement, 34 percent said employees in such programs would no longer receive health coverage and 22 percent said coverage would depend on hours worked. Only 26 percent said that health insurance would be the same as for full-time employees (Exhibit 5.19). Businesses appear reluctant to offer health insurance under phased-retirement programs because of the cost and because they do not want to provide insurance to part-time workers.[18]

Nonetheless, some businesses offer flexible work arrangements to retain mature employees. For example, Varian, a provider of radiotherapy systems, allows certain employees aged 55 and over to negotiate a reduced work schedule, while retaining full medical and dental benefits.[19]

Other programs seek to tap the talent of retirees. For example, Procter & Gamble and Eli Lilly were the initial clients of YourEncore Inc., which helps companies employ highly skilled retirees, such as scientists and engineers, on a contract basis. YourEncore recruits retirees, contracts with employers, and sends the retirees on short-term assignments with the participating companies. Pay is based on the worker's salary at retirement.

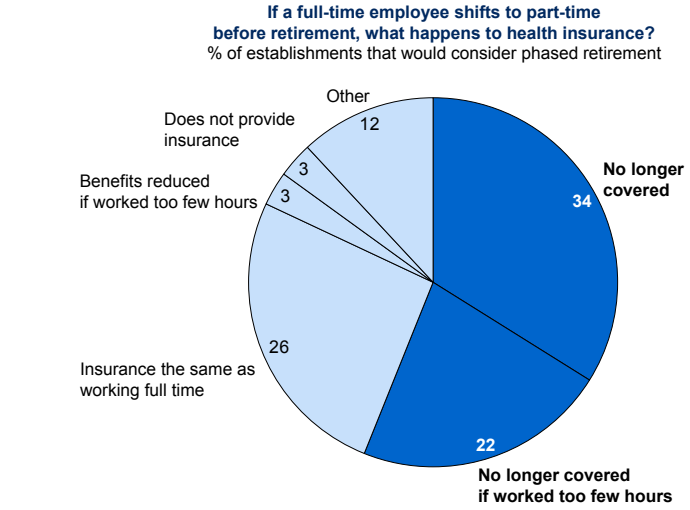
17 Rudolph G. Penner, Pamela Perun, and Eugene Steuerle, "Letting Older Workers Work," The Urban Institute, Brief Series, No. 16, July 2003; Penner, Perun, and Steuerle, "Legal and Institutional Impediments to Partial Retirement and Part-Time Work by Older Workers," Urban Institute, November 2002.

18 Interestingly, provision of differential health benefits are not subject to restrictions from the tax code, ERISA, or ADEA. Hutchens 2007, *op. cit.*

19 Ken Dychtwald, Tamara Erickson, and Bob Morison, "It's Time to Retire Retirement," *Harvard Business Review*, March 2004.

Exhibit 5.19

MAJORITY OF ESTABLISHMENTS LIKELY NOT TO PROVIDE HEALTH INSURANCE UNDER PHASED-RETIREMENT PLAN



Source: Robert Hutchens, "The Cornell Study of Employer Phased Retirement Policies: A Report on Key Findings," Ithaca, New York: School of Industrial and Labor Relations, Cornell University, 2003

Mature workers might have to be more flexible in pay. A separate cost issue is older workers' pay. Some businesses find it is not worth retaining older workers at top pay levels if their productivity is not significantly better than that of younger, lower-paid workers. A few US retailers have let go of longer-tenured workers on this basis.[20] Many US businesses under pressure to cut costs have downsized their workforces by offering buyout packages to their older, more highly paid employees. Others have worked around the problem by hiring retirees on contract for a limited period of time or for a specific project, thereby avoiding the costs of full-time pay or benefits. Another possible solution would be to link pay more directly to productivity—but that would have to be done for all workers to avoid violating federal antidiscrimination laws. Mature workers would have to be more flexible on pay and benefits in return for business being more flexible about retaining them.

Reform private pensions and Social Security to remove disincentives to working longer

Continue pension reform and encourage businesses to take advantage of recent changes that encourage work. In addition to the changes implemented in the Pension Protection Act of 2006 (see Box), other possible changes could be

20 Katherine G. Abraham and Susan N. Houseman, "Removing Barriers to Work for Older Americans," W. E. Upjohn Institute of Employment Research, June 2007, p 24.

made to defined benefit (DB) plans to increase incentives for working longer. For many DB plans, the way in which benefits are calculated creates an incentive to retire early. Working longer does not provide incremental increases to retirement benefits. In some cases, working longer actually reduces eventual pension payments.[21] Under law, employees with DB plans can work part-time and begin receiving pension payments to supplement their income at age 62. This encourages them to continue working part-time. But defined contribution (DC) plans, such as a 401(k), can start paying out benefits when employees reach age 59½. Lowering the DB eligibility age to 59½ would level the playing field and encourage some workers to shift to part-time work, which in turn might make it easier for them to continue working longer.

Several companies have already moved toward allowing employees more work flexibility while collecting pension benefits. For example, Bon Secours Richmond Health System has a variety of arrangements that let employees continue working after they start receiving pension benefits.[22] At age 65 or older, employees can shift to part-time work (up to 24 hours a week) while collecting full pension payments. They can work full-time past age 70½ while collecting their pensions. Or they can retire completely, start receiving pension payments, and then return to work after an absence of at least three months and continue to get pension payments regardless of how many hours they work. In each of these circumstances, employees have an extra incentive to work longer because they continue to earn pension credit if they work more than 1,000 hours a year (about 20 hours a week). Later, when they retire completely, their pension benefit is recalculated and increased.

An increasing number of companies, such as Principal Financial, a financial services firm based in Des Moines, Iowa, allow employees to retire and begin drawing a pension, and then return to work later on contract or as temporary staff employed by an outside firm.[23]

Implementing further reforms to Social Security. Although changes to the normal retirement age (NRA) and the age of early eligibility (AEE) have reduced disincentives to working longer (see Box), further steps along these lines could be taken.[24] For example, Congress and the president could agree to accelerate

21 Penner, Perun, and Steuerle 2002, *op. cit.*

22 Conference Board, 2007, *op. cit.*

23 http://www.principal.com/careers/happyreturn.htm

24 See Gary Burtless and Joseph F. Quinn, "Is Working Longer the Answer for an Aging Workforce?," Center for Retirement Research Issue Brief, December 2002.

scheduled increases in the NRA and could raise the AEE. Both could be indexed to changes in life expectancy. Changes to AEE will likely have a larger impact on physical laborers and might have to be combined with an expansion of the Social Security disability program, which already serves as a de facto early retirement system for many individuals in these jobs. Furthermore, although increases in the NRA would save money for the program, increases in the AEE will not.[25]

Beyond altering ages of eligibility, changes could be made to the calculation of Social Security benefits themselves that would mitigate inherent disincentives for longer working lives.[26] Because Social Security payments are based upon an average over the highest 35 years of earnings, working longer than that provides a relatively smaller increase in benefits while taxes continue to be paid. Instead, the calculation of benefits could be based upon a longer time period such as 40 years, after which workers would no longer be required to pay payroll taxes. That would encourage individuals to work beyond 40 years, since they could keep more of their pay. And businesses, no longer required to make the employer's contribution to payroll taxes, would find these workers less expensive and more attractive.

Furthermore, the current method of calculating benefits does not distinguish between a worker with low earnings and a long career and one who is a high earner with a short career. The earnings for both are averaged over 35 years, and both could receive the same benefits. The high earner is benefiting just as much from the progressive Social Security formula as the low earner. By calculating benefits based only on actual working years, and then adjusting them proportionally, the system's progressive features could more effectively target low earners, while extra years of employment could also be better rewarded. Forthcoming research suggests that workers' retirement decisions are influenced by the way in which Social Security benefits are calculated. Namely, workers recognize that continuing to work past 35 years of service means paying additional taxes but does relatively little to boost benefits. That makes them less likely to continue working.[27]

25 Increases in AEE will not save money because individuals are paid an actuarially fair amount if they retire early or at the NRA. That is, their total benefits remain the same, just paid out on a different schedule.

26 See Gopi Shah Goda, John B. Shoven, and Sita Nataraj Slavov, "Removing the Disincentives in Social Security for Long Careers," NBER Working Paper 13110, May 2007.

27 Jeffrey B. Liebman, Erzo F. P Luttmer, David G. Seif, "Labor Supply Responses to the Social Security Tax-Benefit Link," Harvard University, December 2007.

Recent changes to US government policy that have reduced disincentives to work

Changes to Social Security. Recent modifications in Social Security have greatly reduced some significant disincentives for working later in life that were previously embedded in the program.[28] First, the age at which workers can collect full Social Security benefits (called the normal retirement age, or NRA) is gradually rising from 65 to 67. Americans born in 1937 or earlier could draw full benefits starting at age 65. Everyone born in 1960 and after will be eligible for full benefits at age 67. At the same time, the benefits workers can collect at 62 (which remains the age of early eligibility, or AEE) are being further reduced. In the past, workers could collect 80 percent of their full benefit amount by retiring early at age 62, but the amount is shrinking gradually. Workers born in 1937 or earlier could draw 80 percent of their full benefits at age 62. Those born in 1960 or later will be able to draw just 70 percent of their full benefits.

Second, the so-called earnings test has been relaxed, allowing beneficiaries to earn more income while receiving Social Security without losing benefits. The earnings test no longer applies to workers above the NRA; that means they collect full Social Security benefits regardless of how much other income they earn. For workers between age 62 and their NRA, Social Security benefits are reduced if their earnings exceed a certain level. The levels vary according to the year of attaining the NRA.

Finally, the Delayed Retirement Credit, which raises Social Security payments for those who work longer than the normal retirement age, has been increased. When fully phased in during 2008, workers will be able to boost their benefits by up to 8 percent per year for up to three years. For example, workers with a normal retirement age of 67 can increase their benefits by 24 percent by waiting until age 70 to start collecting.

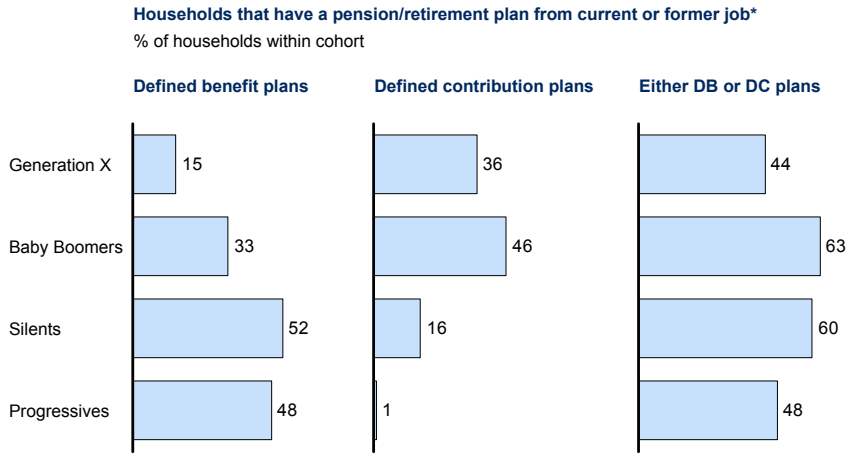
Changes to pension laws. Even though there has been a marked shift in the private sector from employer-sponsored defined benefit (DB) plans to defined contribution (DC) plans over the past two decades, fully one-third of Boomer households have DB plans (Exhibit 5.20). Thus, regulations governing DB pensions are important for Boomer retirement decisions. The Pension Protection Act of 2006 eliminated some incentives to retire by changing the

28 See Alicia H. Munnell and Steven A. Sass, "The Labor Supply of Older Americans," Center for Retirement Research, Working Paper 2007-12; Abraham and Houseman, *op. cit.*

rules for these plans. Previously, DB plans could not make pension payments until workers formally retired. Some plans even required workers to forfeit their earned benefits if they went back to work after retirement. The new law allows employees to work part-time and begin receiving pension payments to supplement their income beginning at age 62.[29]

Exhibit 5.20

1/3 OF BOOMER HOUSEHOLDS HAVE DEFINED BENEFIT PLANS COMPARED WITH MORE THAN HALF OF THE PREVIOUS GENERATION



* Includes DB plans held by spouse.
Source: Survey of Consumer Finance, 2004

Boosting training and other programs to help older workers break down barriers to working longer.

In addition to the top three policy issues described above, we see others worthy of attention. For example, the Boomers will not be able to work longer unless policy makers and businesses address the frictions older workers face in the labor market. As described earlier, research shows that older workers, particularly those with low education and skill levels, have a particularly difficult time making job transitions. Mature workers often are searching for jobs for the first time in many years and have to look in new industries, occupations, and locations. Although Boomers generally have embraced the Internet, some older workers lack even the basic computer skills needed today to look for work via the Web. Others need to update their technical skills.

29 Deloitte, "Securing Retirement: An Overview of the Pension Protection Act of 2006," August 2006.

Then they face potential employers who worry about older workers' employment costs and may hold negative stereotypes about older workers' abilities. Multiple surveys show that employers worry that older workers lack technological skills, are inflexible, have difficulty reporting to younger supervisors, and are easily disgruntled about their pay.[30] These reservations coexist with employer perceptions that older workers are also knowledgeable, have valuable insights into the business, and have a strong ability to mentor others. Leading researchers say new policies are needed to help older workers move more easily between jobs.[31]

One solution is job training and employment services aimed at helping older workers apply for jobs. But funding for the Workforce Investment Act, the US government's primary employment services program, has fallen by more than one-third in real terms over the past decade.[32] Some policy makers call for expanding such programs and adjusting them to better serve mature workers. But other policy makers have proposed that the government instead provide portable vouchers that workers could use to pay for training anywhere in the country.

Whatever the mechanism, however, policy makers must ensure that US workers of all ages have the education and skills to fill the jobs of the future. One way to share the costs of training and other employment assistance is through private-public partnerships. CVS Caremark, for example, is actively recruiting and training older workers to help serve the drugstore chain's aging customer base. Using federal funds, CVS teamed with the US Labor Department to create seven regional training centers next door to government-run One-Stop Career Centers, which provide job seeking assistance.[33] The One-Stop center provides the space, while CVS provides the staff and equipment to train job seekers. Current CVS employees also can go to the centers to gain new skills.

Several states have launched public-private partnerships to address several of the issues raised by an aging workforce. For example, the state governments in Arizona and Arkansas have collaborated with local businesses and AARP to create "mature worker initiatives." These are aimed at educating employers about the advantages of older workers, identifying businesses' concerns, and lowering the barriers to the hiring of older workers.

30 See, for example, AARP, "Business Executives' Attitudes Toward the Aging Workforce: Aware But Not Prepared?," 2006; and the Arizona Mature Worker Initiative, "Mature Workers Experience in Our Business. Year One Outcomes and Recommendations," Report to Governor Janet Napolitano, 2006.

31 Abraham and Houseman, *op. cit.,* p. 26.

32 Abraham and Houseman, *op. cit.,* p. 28.

33 Conference Board, *op. cit.,* pp. 67–68.

BOOMERS NEED TO CHOOSE WHETHER TO SAVE MORE

We have seen how the Boomers, right up until today, have chosen spending over saving. Looking ahead, individual Boomers will need to make the hard choice of whether they are willing to spend less now to improve their living standards later. Because Late Boomers have a longer runway to retirement, changes in spending and saving behavior today could have a significant impact for them. Although businesses and government may be able to make it easier for Boomers to save, ultimately it is a choice that individual Boomers must make. Or, they can choose to face the consequences of lower living standards in old age.

Government could encourage more saving

The biggest lever that the federal government has to influence savings is the US tax code. Broad-ranging tax reform and simplification could boost savings by reducing some of the current disincentives to save, rationalizing the maze of programs intended to promote savings, and significantly cutting compliance costs.

The President's Advisory Panel on Federal Tax Reform has noted how the current tax code creates an inherent disincentive to save.[34] Income is taxed when received by households, and if this income is consumed, no other taxes are paid. But if this income is saved, taxes must be paid on any additional income generated by saving. Although this additional income should fairly compensate households for postponing consumption, the fact that it is taxed means that consumption today is cheaper than financing equivalent consumption in the future. Compounding this problem is the complexity introduced by the different tax treatment of savings depending on the vehicle that is chosen (Exhibit 5.21).

The government has created a large number of plans aimed at promoting savings. At least a dozen tax preferred options exist for retirement savings alone, with widely varying compliance rules that run up significant administrative costs. For example, businesses that employ fewer than 40 workers can offer employees either a 401(k) or SIMPLE Individual Retirement Account plan, which have widely different options (Exhibit 5.22). In addition, because these plans generally reduce taxable income, one consequence is that they provide greater benefits to those who pay the highest tax rates. Individuals who pay little or no taxes because of the progressivity of the tax code benefit less from these plans.

34 For a detailed discussion of the points in this section, see The President's Advisory Panel on Federal Tax Reform, Final Report, November 2005, at www.taxreformpanel.gov; see also Government Accountability Office, "Understanding the Tax Reform Debate," GAO-05-1009SP, September 2005.

Exhibit 5.21

DIFFERENT TAX TREATMENT OF INVESTMENTS UNDER CURRENT LAW

Investment type	Tax rate	When taxes are due
Bonds		
• Municipal	• Tax-free	• Never
• Federal	• Regular rates	• Yearly
• Federal savings bonds (not for education)	• Regular rates	• Time of sale
• Corporate	• Regular rates	• Yearly
Savings Account or Certificate of Deposit	• Regular rates	• Yearly
Corporate Stock		
• Capital gains	• Capital gains rate	• Time of sale
• Dividends	• Dividend rate	• Year received
Small Business*	• Regular rates	• Yearly
Housing	• Tax-free up to $500,000**	• Time of sale
Annuities and whole life insurance	• Regular rates	• Year received

* Most small businesses are not corporations, and their earnings are taxed on owners' returns.

** Capital gains above $500,000 ($250,000 for singles) are taxed at the capital gains rate.

Source: The President's Advisory Panel on Federal Tax Reform, Final Report, November 2005

Exhibit 5.22

EXAMPLE OF VARIATION IN SMALL-EMPLOYER RETIREMENT PLANS

	401(k) Plan	SIMPLE IRA Plan
Pre-tax Contribution Amount	• $14,000 in 2005	• $10,000 in 2005
Catch-Up Amounts	• $4,000 in 2005	• $2,000 in 2005 yearly
Employer Matching	• May be matching and/or nonelective	• *Either* a full match on elective contributions up to 3% of pay or 2% nonelective contribution
Nonelective Contributions	• Matching not limited to 3%, and match may be less than full	• Nonelective contributions limited to 2% of pay
Discrimination Testing	• Yes	• No
Vesting	• Vesting schedule may be added	• Full vesting of employer contribution
Top-Heavy Contributions	• May be required	• Not required
Plan Loans	• Permitted	• Not permitted
Other Plans	• May adopt other qualified plans	• May not sponsor any other SIMPLE plan or qualified plan
Pooling of Plan Assets	• May pool 401(k) contributions into a single trust invested by trustee	• Individual assets within IRAs invested by employees
Eligibility	• Eligibility may exclude employees with less than 1,000 hours of service	• Eligibility must include employee who earns $5,000 or more during calendar year
ERISA Applicability	• Protects benefits from creditors	• Not applicable
Required Return	• Form 5500 annual filing	• No Form 5500 filing

Source: The President's Advisory Panel on Federal Tax Reform, Final Report, November 2005

To improve retirement savings, the first objective of any tax reform would be to mitigate or even eliminate the current disincentives. There is consensus that rationalizing and simplifying the options for retirement savings would increase participation and reduce compliance costs. Other options include providing equal treatment for investments outside tax-preferred accounts and eliminating the taxation of dividends. Some advocate additional provisions to expand the "saver's credit" system now in place that provides retirement savings subsidies for lower income workers. Some policy advocates favor moving to a more consumption-based tax system. Each of these proposals can be combined with others to maintain the current progressivity in the tax code if that were the policy goal.

Because of the current importance of housing as a vehicle for retirement savings, it is imperative to consider how any tax reform would affect the preferential treatment of housing in the tax code. The President's Advisory Panel cites estimates from the Treasury Department showing that the effective tax rate on housing investment is zero, while the effective rate on business investment is 22 percent. They also cite estimates from the Joint Committee on Taxation showing that more than half of the benefits from the housing provisions go to the approximately 12 percent of the population that earns more than $100,000 a year. Some argue that this has caused US households to rely too heavily on their homes as saving vehicles and has encouraged overinvestment in housing as a share of the economy. The tax code could easily be altered to reduce these incentives. But since homeownership is the only savings vehicle for many families, any change in its tax treatment should be combined with steps to ensure that these households continue to save in some other way.

Businesses can make saving easier

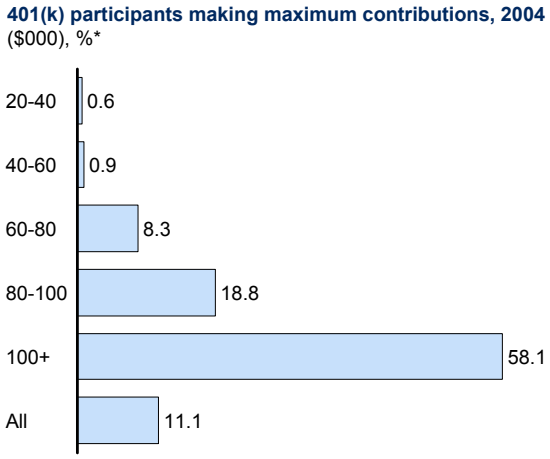
Approximately half of employees are eligible for 401(k) plans, and only about 80 percent of eligible workers participate. Furthermore, of those who do save in retirement accounts, very few of those who make under $100,000 made the maximum annual contribution to their 401(k) in 2004 (Exhibit 5.23). But recent research in behavioral economics has demonstrated how retirement plans can be designed to significantly boost participation, raise saving rates, and improve asset allocation.[35] The key is changing the default option from nonparticipation to participation through automatic elements such as automatic enrollment,

35 For recent summaries, see Shlomo Benartzi and Richard H. Thaler, "Heuristics and Biases in Retirement Savings Behavior," *Journal of Economic Perspectives,* vol. 21, no. 3 (Summer 2007), pp. 81–104; James J. Choi, et. al., "Saving for Retirement on the Path of Least Resistance," in Edward J. McCaffrey and Joel Slemrod, eds., *Behavioral Public Finance* (New York: Russell Sage Foundation, 2006).

escalation of saving rates over time, and investment into diversified portfolios. These automatic elements are always balanced with the choice to opt out.

Exhibit 5.23

A SMALL MINORITY OF MIDDLE- AND LOW-INCOME HOUSEHOLDS MAXIMIZE CONTRIBUTIONS TO THEIR 401(k)



* Maximum contributions in 2004 were $15,000 for those 50 and younger.
Source: Survey of Consumer Finances; Alicia H. Munnell and Annika Sundén, " 401(k) Plans Are Still Coming Up Short," Center for Retirement Research, Issue Brief, no. 43, March 2006

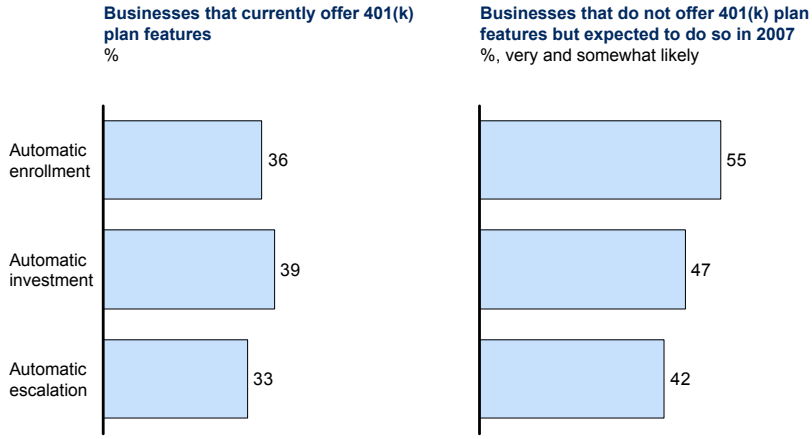
The success of these model retirement programs has already had significant influence on public policy. The Pension Protection Act of 2006 resolved important legal and regulatory ambiguities and created incentives to implement these plans. Companies can avoid nondiscrimination tests (which require them to demonstrate that higher and lower paid employees are being treated fairly) if they follow basic guidelines such as automatic enrollment of new employees, minimum initial saving rates of 3 percent, and automatic escalation of 1 percent of salary per year (reaching 6 to 10 percent).[36] A recent survey by Hewitt shows that 36 percent of employers surveyed had automatic enrollment programs at the end of 2006 and that more than half (55 percent) of other employers were likely to implement these programs in 2007. Similarly, many employers planned to implement the automatic escalation and investment features (Exhibit 5.24). And the board that oversees the Thrift Savings Plan, a 401(k)-type plan for federal workers, has asked Congress to allow US government agencies to automatically enroll new employees in the plan.

36 Retirement Security Project, "Analysis of the Pension Protection Act of 2006: Increasing Participation Through Automatic 401(k) and Saver's Credit," August 2006; Benartzi and Thaler, *op. cit.*

Since only half of the population has access to 401(k) plans, a related idea is for employers to offer automatic enrollment in Individual Retirement Accounts. That would enable employees without access to a 401(k) to enjoy the benefits of the automatic plans. Legislation was introduced in 2007 to implement this idea.

Exhibit 5.24

PENSION PROTECTION ACT OF 2006 IS EXPECTED TO ENCOURAGE MANY MORE BUSINESSES TO OFFER AUTOMATIC 401(k) FEATURES



Source: Hewitt Associates; "Survey Findings: Hot Topics in Retirement, 2007," January 2007

Key features of "automatic" retirement plans

Automatic enrollment overcomes the inertia of forcing employees to "opt-in" to a plan and make a series of complicated decisions. In an early study, instituting automatic enrollment raised new hire participation rates from 49 to 86 percent. The increase in participation was especially large for low- and moderate-income workers and other population groups least likely to save.[37] In another study, participation rates ranged from 25 to 43 percent at six months of tenure before automatic enrollment and jumped to between 86 and 96 percent when the new program was implemented.[38] All studies of the automatic enrollment programs demonstrate that attrition rates are very low.

37 Brigitte C. Madrian and Dennis F. Shea, "The Power of Suggestion: Inertia in 401(k) Participation and Savings Behavior," *The Quarterly Journal of Economics*, vol. 116, no. 4 (November 2001), pp. 1149–1525.

38 Choi, et. al., *op. cit.*

Even though automatic enrollment overcomes initial inertia, people tended not to change their initial saving rates from the typically low default of around 3 percent. This led to the idea of automatic escalation whereby saving rates would automatically increase, for example, at the same time as an increase in pay, until they reached a predetermined maximum. One study found that by the fourth pay increase, average saving rates were 13 percent for program participants, compared with 6 percent for those who declined to participate.[39] Another study found that 84 percent of employees whose automatic enrollment included automatic escalation stayed with the program.[40]

Some plans also feature automatic investment. Today, many 401(k)-type accounts fail basic standards of diversification and sound asset allocation: Millions of workers are overconcentrated in their employer's stock or overinvested in safe but low-yielding money market funds.[41] With automatic investment, employee contributions are invested in prudently diversified and low-cost vehicles, such as broad index funds, professionally managed funds, life cycle, or targeted investment funds.

• • •

To quote a song from the Boomers' youth, the Boomer journey has been a "long and winding road." It is not over yet. Where that road ends will be up to the Boomers themselves—as individuals and as the decision makers at the top of corporations and government. What will Generation Xers say of their predecessors? Will they say that the Boomers were pioneers who brought women and minorities into the education system and workforce, and drove a high-tech boom and opening to the world that created two decades of unmatched prosperity, who then ended their careers with further innovations in the participation of older Americans in the economy? Or will they say the Boomers had every opportunity, made a lot of money, spent it, and then left a mess for future generations to spend decades cleaning up? It is time for the Boomers to act.

39 Richard H. Thaler and Shlomo Benartzi, "Save More Tomorrow™: Using Behavioral Economics to Increase Employee Saving," *Journal of Political Economy*, vol. 112, no. 1 (February 2004), pp. 164-87.

40 Shlomo Benartzi, Ehud Peleg, and Richard H. Thaler, "Choice Architecture and Retirement Saving Plans," UCLA, 2007.

41 Thaler and Benartzi, "Save More Tomorrow™," *op.cit.*; Benartzi, Peleg, and Thaler, *op. cit.*

A. Macroeconomic Context

The growth of the US economy over the next 10 to 20 years is our primary interest, as this period coincides with the majority of Baby Boomer retirements. However, when we completed our baseline forecast in October 2007, the ongoing housing crisis was generating a high level of uncertainty about the likely performance of the economy in 2008 and 2009. To the extent that the housing market collapse hurts household balance sheets, this could have a longer term impact on the ability of the Boomers to finance their golden years. This is particularly true for Early Boomers on the cusp of retirement. Even though uncertainty was high (and has not been resolved as we write this report in early 2008), we worked to capture the basic dynamics of this crisis in our outlook.

To be sure, the risks to the forecast in the short term are predominantly on the downside. If these risks are realized, matters will be worse for the economy in general and the Boomers specifically. Despite the short-term problems, the trajectory of the economy will be determined in the medium and longer term by growth in the labor force, the capital stock, and total factor productivity.

In this appendix, we first describe the components of our baseline forecast, including how we have handled the near-term uncertainty in the housing market, and project the longer term trends. Next, we explain our two "prolonged saving" scenarios—spending less and working more—that quantify the impact of changes in behavior described in Chapter 5.

The primary tool we used to develop our baseline and alternative macroeconomic scenarios is Oxford Economics' Global Model.[1] We used Oxford's ten-year forecast completed in October 2007 as a starting point for our baseline forecast. The Oxford outlook is largely maintained, although we have implemented some changes that reflect MGI's point of view on how the economy is likely to evolve both in the short term, through the housing market crisis, and in the longer term, with labor force participation, capital accumulation, productivity, and household saving. Beyond 2017, MGI has developed a long-term forecast through 2035 that extends the predictions from the Oxford model. This forecast is based upon our view of demographic trends and the growth in potential output for the US economy over this period.

For macroeconomic and demographic variables not available from the Oxford model or for which we prefer an alternative forecasting approach, we developed our own forecasts consistent with the broader macroeconomic context.

BASELINE FORECAST

In describing the baseline forecast, we distinguish between the near-term growth outlook, which is being buffeted by the ongoing turmoil in the housing market, and the impact of aging and the eventual retirement of the Baby Boomer cohort on longer term growth prospects. We also discuss our assumptions regarding government entitlement programs and their impact on the deficit, some key demographic trends, and factors influencing the accumulation of net worth by households.

Housing market crisis will slow near-term growth and reduce households' net worth

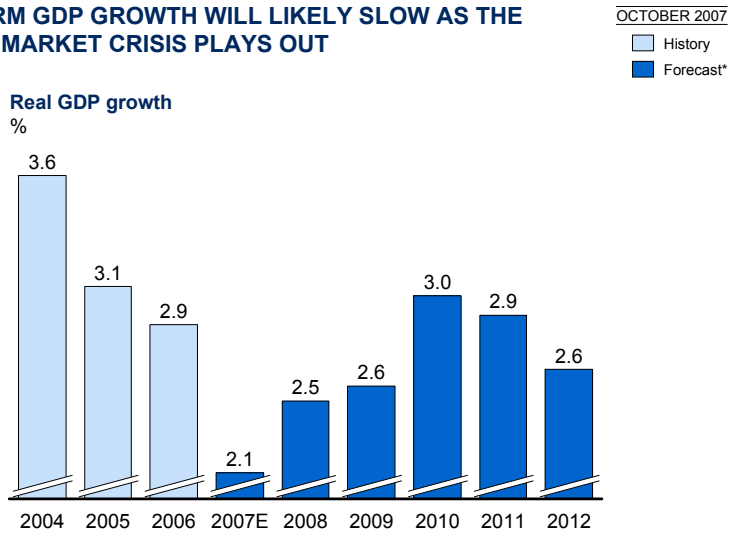
We started our short-term outlook with the widely shared presumption that the brunt of the housing market downturn will be felt in 2008, with some spillover into 2009. Thus, we expect slower growth over the next couple of years before a modest rebound (Exhibit A.1).[2] The unemployment rate rises from approximately 4.6 percent in 2007 to 5.1 percent in 2008 and 2009. Our baseline is not as pessimistic as those of some forecasters, many of whom in the closing days of 2007 significantly cut their growth estimates for the next couple of years (Exhibit A.2). Growth projections were cut further during the first quarter of 2008, with many forecasters believing that the economy will be in a mild recession during the first

1 Oxford Economics' proprietary Global Model encompasses detailed country models for the top 45 economies and provides top-line macroeconomic variables for an additional 39 countries. The country models interlink fully via trade, prices, exchange rates, and interest rates and, taken together with the other blocs, provide world coverage. See http://www.oxfordeconomics.com/

2 At the time of our forecast, we had data through the third quarter of 2007.

Exhibit A.1

NEAR-TERM GDP GROWTH WILL LIKELY SLOW AS THE HOUSING MARKET CRISIS PLAYS OUT

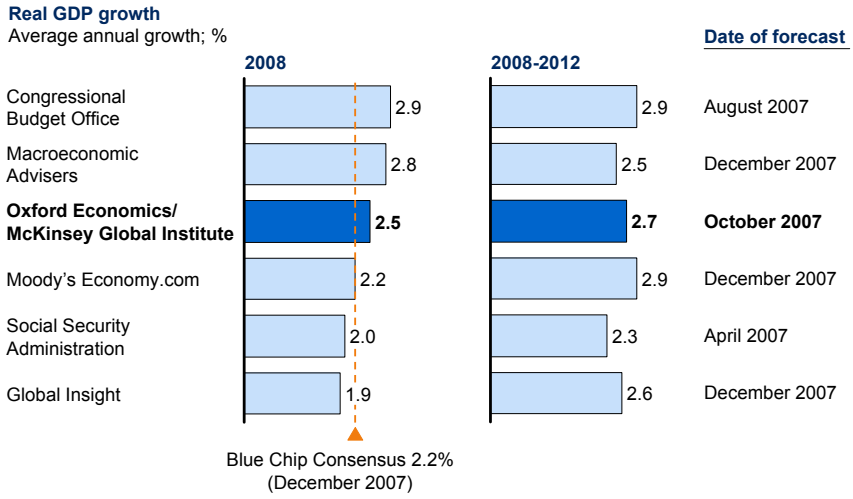


* Estimate for 2007 was based on final estimates for the first half of 2007 and the preliminary BEA estimate of third-quarter GDP. Final estimate of GDP by BEA indicates growth of 2.2 percent in 2007.

Source: McKinsey Global Institute US Consumer Model, v7.2

Exhibit A.2

CONSERVATIVE ECONOMIC PROJECTIONS ARE SLIGHTLY LESS PESSIMISTIC THAN CONSENSUS FOR 2008 GROWTH



Source: McKinsey Global Institute US Consumer Model, v7.2; Congressional Budget Office; Macroeconomic Advisers; Social Security Administration, Report of the Trustees; Global Insight; Moody's Economy.com

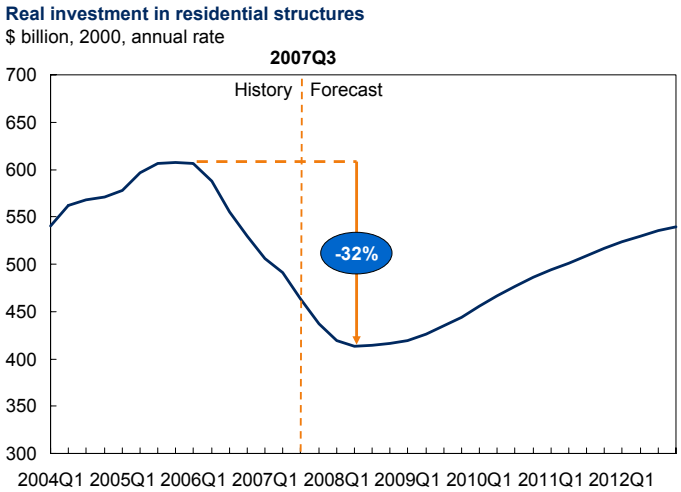
half of the year. Even so, aggressive interest rate cuts by the Federal Reserve, combined with the economic stimulus package recently enacted by Congress and signed by the president, have led many observers to expect the economy to bounce back in the second half of 2008. Thus, for the year as a whole, growth is likely to be slow, but not negative. When looking out over the next five years, which is just the beginning of the relevant time frame for our purposes, most observers have not changed their views substantively, and our baseline projection remains in the middle of the pack, as indicated in Exhibit A.2.

There are two primary consequences of the housing crisis that are important for our outlook. The first is the collapse in spending on new housing and home improvements. We expect that residential construction will continue to decline, eventually dropping by one-third from its peak and not posting any significant positive growth until well into 2009 (Exhibit A.3). The primary driver of this slowdown is the overhang of unsold housing inventory. Amplifying this problem is the increased costs of mortgage financing that has been driven by the meltdown in the subprime market.

Exhibit A.3

DRAMATIC DROP IN RESIDENTIAL CONSTRUCTION WILL SLOW GDP GROWTH AND CURTAIL ADDITIONS TO REAL ESTATE WEALTH

OCTOBER 2007



Source: McKinsey Global Institute US Consumer Model, v7.2

The drop in residential construction is the biggest contributor to slowing GDP growth in the near term. Slower GDP growth means poorer job prospects and slower income creation for households. Furthermore, lower rates of residential investment imply less consumer spending on housing-specific goods, such as furniture and appliances, adding to the drag on the economy. Additionally, the slowdown in residential construction implies that households will be adding new

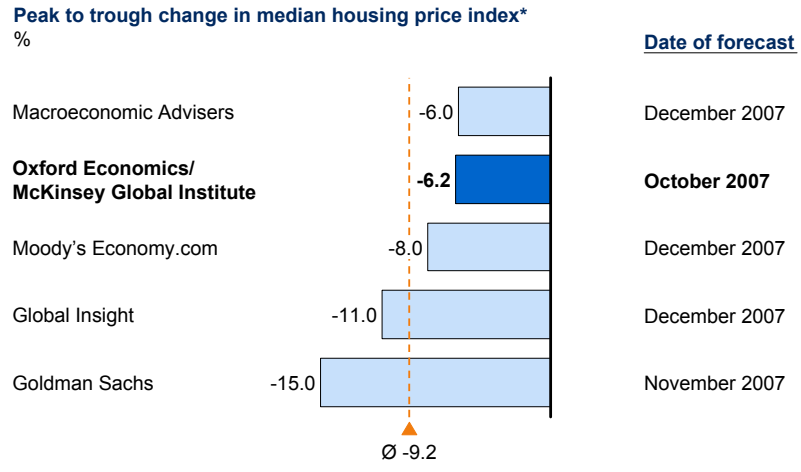
real estate wealth at a slower rate. Less spending on new investments means less wealth that households will carry forward.

A second consequence of the housing crisis has been a fall in median home prices in many parts of the country. And we expect prices to decline further. Our forecast projects a 6.2 percent drop in the US median home price from its high point in 2007 to a low point in 2009. This will be the first time that the national median house price will have declined in the 30 years that the data have been collected. It translates into an 11 percent decline after adjusting for inflation. Real home prices have not fallen since the 1991 Persian Gulf War and the recession that followed (see Exhibit 4.2).

Given the unprecedented nature of these developments and high levels of uncertainty, we have adopted a conservative stance relative to other published forecasts, but the magnitude of the drop-off we have included captures the impact of housing price declines (Exhibit A.4). As with our overall outlook, the risks to the housing price forecasts are clearly to the downside.

Exhibit A.4

CONSERVATIVE BASELINE HOUSING PRICE DECLINE LESS PESSIMISTIC THAN SURVEY OF PROGNOSTICATORS



* OFHEO median housing price index peaked in the second quarter of 2007. Trough is mid-2009.
Source: McKinsey Global Institute US Consumer Model, v7.2; Macroeconomic Advisers; Global Insight; Moody's Economy.com; Goldman Sachs

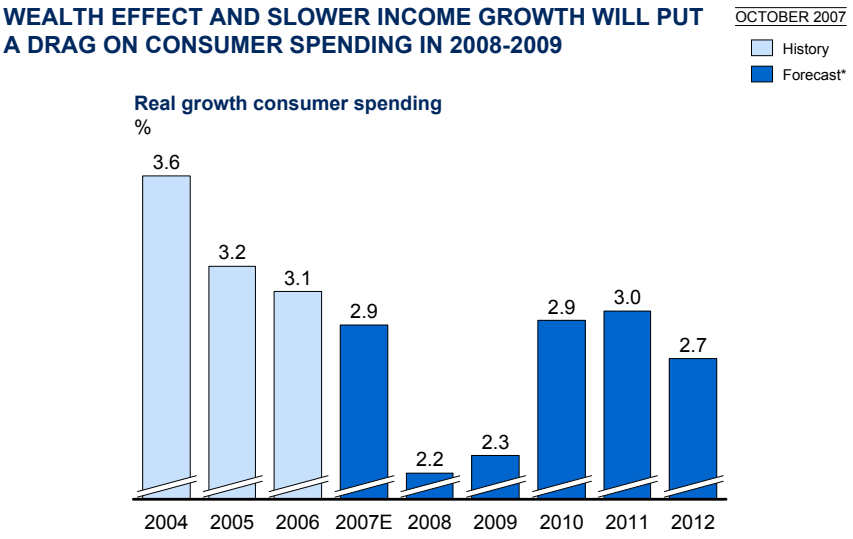
Falling home prices are significant because they reduce the value of households' wealth. This wealth revaluation affects all households in the economy and therefore will have wider consequences than the problems with subprime mortgages, which directly affect only a small portion of homeowners. When the decline in the value of real estate wealth is combined with smaller additions to wealth because of lower rates of residential investment, we expect it will erase the gains made

by households between 2000 and 2005. After the housing market correction plays out, increases in real estate wealth are expected to grow at the pre-2000 long-term trend (See Exhibit 4.3). We forecast that by 2012, the nation will have approximately $4 trillion less in real housing wealth than it would have had if housing prices were to merely stall rather than fall for the next two years.

Just as rising wealth boosted spending between 1985 and 2005, as illustrated in Chapter 3, the slowdown in household wealth accumulation, combined with slower overall income growth, is expected to dampen consumer spending in 2008 and 2009 (Exhibit A.5). This slowdown in spending on top of the drop in residential construction explains the slower GDP growth in the early part of our baseline forecast.

Exhibit A.5

WEALTH EFFECT AND SLOWER INCOME GROWTH WILL PUT A DRAG ON CONSUMER SPENDING IN 2008-2009



* Estimate for 2007 was based on final estimates for the first half of 2007 and the preliminary BEA estimate of third-quarter growth.

Source: McKinsey Global Institute US Consumer Model, v7.2

Long-term economic growth will slow with the aging population

The demographic transition now under way will have a clear impact on future economic growth. As discussed in Chapter 4, the aging of the Boomers will drive down overall labor force participation. We also assume that labor productivity, and thus capital deepening and total factor productivity, will remain in line with longer term trends in the US economy. As a result, with lower labor force growth and the unemployment rate holding steady at 5 percent, trend growth in real GDP will also slow (see Exhibit 4.4). Long-term economic growth can be higher only if Boomers extend their working lives, if businesses become more capital intensive and boost their investment per worker, or if the United States manages to generate growth in total factor productivity above the long-term trend, as happened in the 1990s.

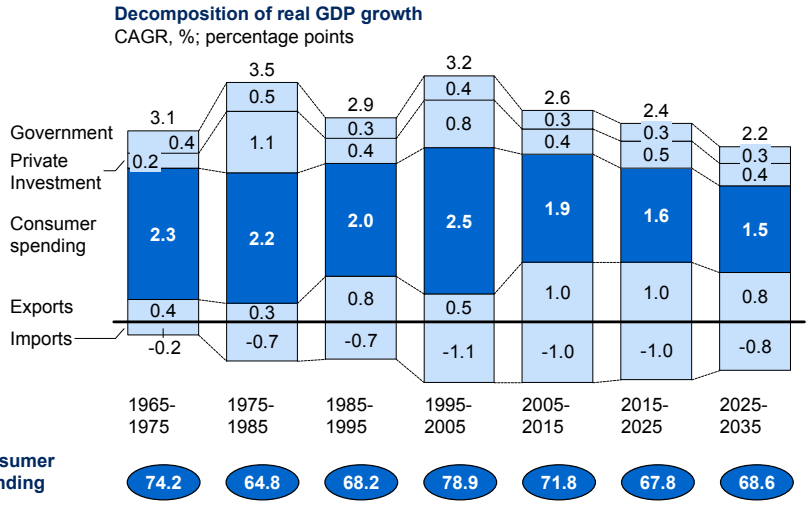
With lower overall economic growth, consumers will see slower gains in disposable income, and spending growth will similarly downshift (see Exhibit 4.10). Spending growth slows more than income gains, as household seek to improve their balance sheets and push up the saving rate from historic lows (see Exhibit 4.11). In the long term, inflation as measured by the personal consumption price deflator will increase at 2.2 percent annually.

External balances improve in the long term with the current account deficit falling approximately by half over the next two to three decades to just under 2.5 percent of GDP. This improvement is driven by a reduction in the trade balance as the aging population shifts spending more toward domestically produced services, particularly medical (see Exhibit 4.12), and the broad effective exchange rate depreciates. Viewed from the perspective of borrowing and lending, the uptick in consumer saving and an increase in corporate savings (or, equivalently, a reduction in net borrowing by households and corporations) offset a deterioration of government balances. This raises national savings modestly, from about 14 percent of GDP in 2005 to just over 16 percent in 2035, reducing the demand for funds from the rest of the world.

Driven by steady increases in medical spending (see Exhibit 4.12), consumer spending will remain the most important demand-side driver of real GDP, although its share of growth will decline from the record contributions tallied from 1995 to 2005 (Exhibit A.6).

Exhibit A.6

CONSUMPTION WILL PLAY A SMALLER BUT STILL DOMINANT ROLE IN DRIVING GDP GROWTH



Note: Figures may not sum due to rounding; Growth due to consumer spending calculated using unrounded figures.
Source: McKinsey Global Institute US Consumer Model, v7.2

Definition of Consumption Categories

Spending categories in our projections follow the definitions in the National Income and Product Accounts, published by the Bureau of Economic Analysis. These accounts contain the official measure of GDP and other components of economic activity.[3] The broad spending categories presented here fall into 11 groups:

- **Clothing, accessories, and jewelry:** men, women, boys and girls clothing, shoes, accessories, and jewelry
- **Education and research:** higher education; nursery, secondary and elementary schools
- **Electronics, computers, and software:** video and audio goods; computers, software, and peripherals
- **Food, alcohol, and tobacco:** food and alcohol consumed at home and away from home; tobacco products
- **Housing:**[4] rent and equivalents for owner-occupied housing; furniture, appliances, and other durable and nondurable house furnishings; household utilities and telecommunications; hotels
- **Medical:** services including doctors, hospitals, and nursing homes; drugs, medical devices, and health insurance
- **Nonprofit activity:** spending on religious, advocacy, civic, social, and charitable organizations; child care (excluding educational programs)
- **Personal business:** brokerage and investment counseling, bank service charges, legal services
- **Personal care:** toiletries, preparations, barbershops, beauty parlors, and health clubs
- **Recreation:** spectator and participant amusement; wheel goods, sports and photographic equipment; magazines, newspapers, and books
- **Transportation:** automobile purchases, service and repair; mass transit, taxis, airlines, trains, and buses

3 For an overview of national accounts methodology, see www.bea.gov/national/pdf/nipa_primer.pdf

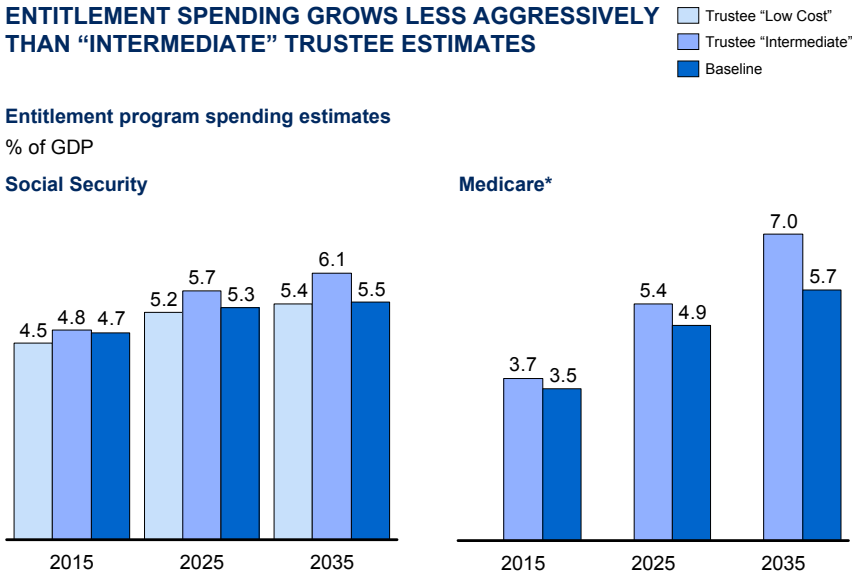
4 For an explanation on how housing is treated in the national accounts, see www.bea.gov/papers/pdf/RIPfactsheet.pdf

Growth in Social Security and Medicare will outstrip GDP, making transfers an increasing part of personal income and raising the federal budget deficit

To estimate Social Security and Medicare transfers, we considered the benchmarks provided by the Social Security and Medicare trustees, the growth in the programs that is feasible given slowing GDP and household income creation, and the broad constraints faced by the government. Combining these perspectives, our baseline assumption is that reforms will be made in the health care system and entitlement programs so medical spending remains a dominant but not overwhelming driver of spending growth, and that the federal budget does not deteriorate beyond reasonable historical experience. For both programs, this translates to growth below the "intermediate" scenarios developed by their trustees (Exhibit A.7).

Exhibit A.7

ENTITLEMENT SPENDING GROWS LESS AGGRESSIVELY THAN "INTERMEDIATE" TRUSTEE ESTIMATES



* Medicare trustees do not report a low cost estimate for all the components of Medicare.
Source: McKinsey Global Institute US Consumer Model, v7.2; Medicare and Social Security Trustee Reports, 2008

For Social Security, real benefits per household aged 60 and older will increase at 1.1 percent annually over the next 30 years (using the broad-based consumption price deflator). This is slower than the 1.6 percent average over the last 30 years, but just below the 1.3 percent average real annual increase since 1995. Our projection falls between the "intermediate" and "low cost" estimates provided by the trustees.

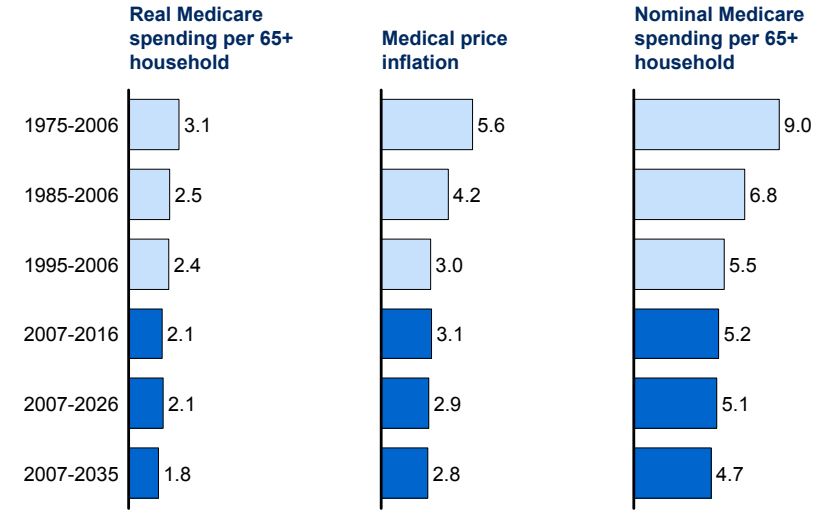
Medicare has historically accounted for about 62 percent of medical spending for households aged 65 and older. With this, we estimate that real Medicare

spending per 65-plus household will slow gradually over the forecast period as reforms are assumed to take hold. With price increases moderating as well, nominal spending per household also slows in the long term (Exhibit A.8). Even at this reduced pace of Medicare cost increases, by 2035 this program will account for more than 36 percent of all transfers to households, 50 percent higher than today.[5]

Exhibit A.8

INCREASES IN REAL MEDICARE SPENDING PER 65+ HOUSEHOLDS WILL SLOW GRADUALLY ALONG WITH MEDICAL PRICE INFLATION

CAGR, %



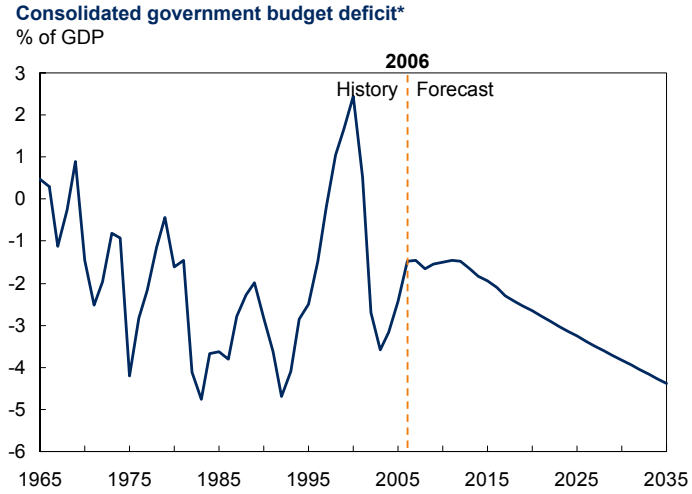
Source: McKinsey Global Institute US Consumer Model, v7.2

With increases in these entitlement programs, transfers jump from 14.4 percent of personal income today to 18.4 percent in 2035. Income from wages and salaries becomes a less important driver of personal income as the population ages. More transfers also means more personal income, which rises to nearly 85 percent of nominal GDP, giving households a share of the economic pie that they have achieved only a half-dozen times since 1960. More transfers also mean larger budget deficits, which will deteriorate steadily over the forecast period (Exhibit A.9).

5 Social Security and Medicare transfers from the government to households are counted as personal income, according to national accounting standards. Social Security is included because the money goes directly into the hands of households. Medicare payments are included to account for medical spending attributed to households but paid for by Medicare. Payments by private insurance are also included in personal income but are counted as benefits from employers, not transfers from the government.

Exhibit A.9

GOVERNMENT DEFICIT RISES WITH GROWTH IN ENTITLEMENT PROGRAMS



* NIPA definition that includes both federal and state & local governments.
Source: McKinsey Global Institute US Consumer Model, v7.2

Key household demographic trends will remain stable over the forecast

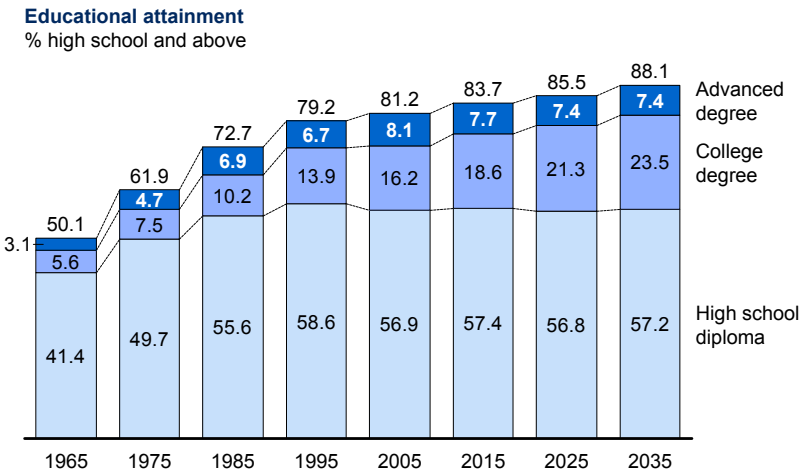
In Chapter 2, we discussed a number of demographic themes that defined the Boomer experience, amplified their economic impact, and differentiated them from previous cohorts. The most important among them were educational attainment, average household size, the average number of children per household, the number of households, and the proportion of married-couple households. These factors are also important determinants of future income growth.

Higher educational attainment was one of the most important drivers of the Boomers' success. But as discussed in Chapter 2, there is less opportunity to achieve similarly dramatic gains in the future—women have closed the gap in attainment, and overall attainment rates are at very high levels. With our forecasts of household and government spending on education, and our projections of enrollment and graduation rates, we find that higher educational attainment will continue to rise, but at slower rates than in the past (Exhibit A.10).

Average household size has remained fairly stable since 1990, after falling dramatically as the Boomers moved into their peak household formation years. We expect it to fall only marginally over the forecast period (Exhibit A.11). Continued (although slower) increases in per capita income and stabilization in the relative price of housing will put some downward pressure on household size. But the share of population 16 and younger will hold steady at about 22 percent, according

Exhibit A.10

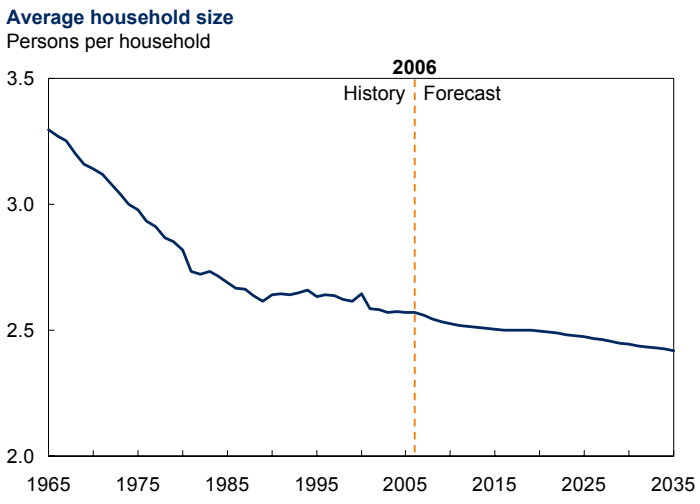
HIGHER EDUCATIONAL ATTAINMENT CONTINUES TO RISE BUT AT A MUCH SLOWER PACE THAN IN THE PAST



Source: McKinsey Global Institute US Consumer Model, v7.2

Exhibit A.11

AVERAGE HOUSEHOLD SIZE WILL DECLINE MARGINALLY OVER THE FORECAST PERIOD

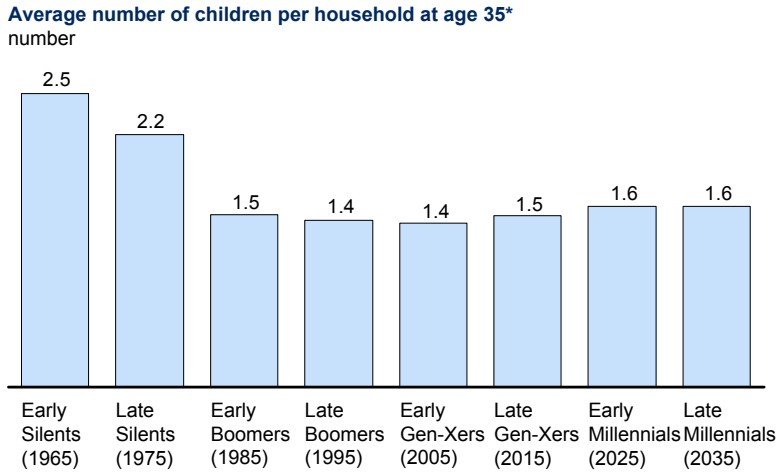


Source: McKinsey Global Institute US Consumer Model, v7.2

to the US Census Bureau. The number of children per household will rise slightly in the long run, putting upward pressure on household size (Exhibit A.12).

Exhibit A.12

NUMBER OF CHILDREN PER HOUSEHOLD WILL RISE IN THE LONGER TERM BUT REMAIN WELL BELOW EARLIER LEVELS



* Age refers to cohort midpoint.
Source: McKinsey Global Institute US Consumer Model, v7.2

The Census Bureau is projecting that population growth will slow to 0.8 percent annually over the next 30 years, compared with the 1.1 percent pace achieved in the past three decades. With population growth slowing and average household size remaining stable, the rate of growth of new households will drop to 1 percent per year from 2007 to 2035, compared with 1.5 percent annually from 1975 to 2006.

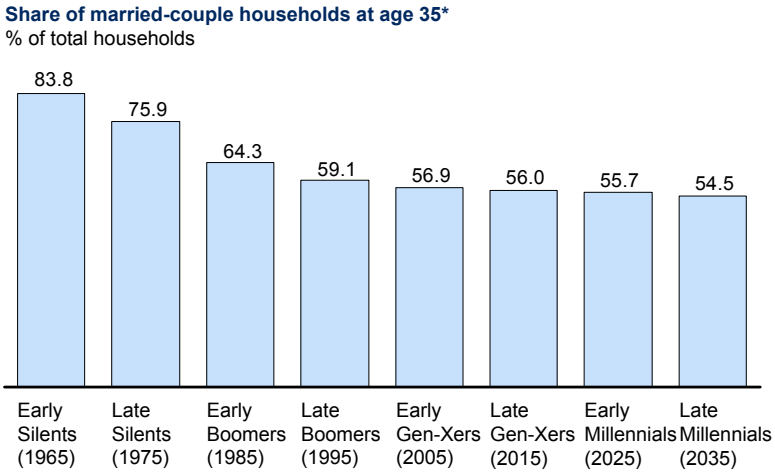
Finally, along with household size, the proportion of married-couple households fell as the Boomers came of age. It has drifted lower since then and will continue to do so, but at a much slower pace (Exhibit A.13). Upward drift in the number of children per household and more modest increases in educational attainment will slow the rate of decrease in the years ahead.

Composition of household saving and asset appreciation rates will settle at long-term averages

In Chapter 4, we discussed the slowdown in overall net worth creation by households (see Exhibits 4.13 and 4.14). We noted that the modest rise in the saving rate over the forecast period will help boost household net worth in the longer term (although the saving rate bounces back merely to mid-1990s levels, less

Exhibit A.13

PROPORTION OF MARRIED-COUPLE HOUSEHOLDS WILL STABILIZE



* Age refers to cohort midpoint.
Source: McKinsey Global Institute US Consumer Model, v7.2

than half the pre-1985 rate). But household net worth creation will be moderated by rates of asset appreciation that settle at their long-term averages, which are slower than the rates experienced in recent years.

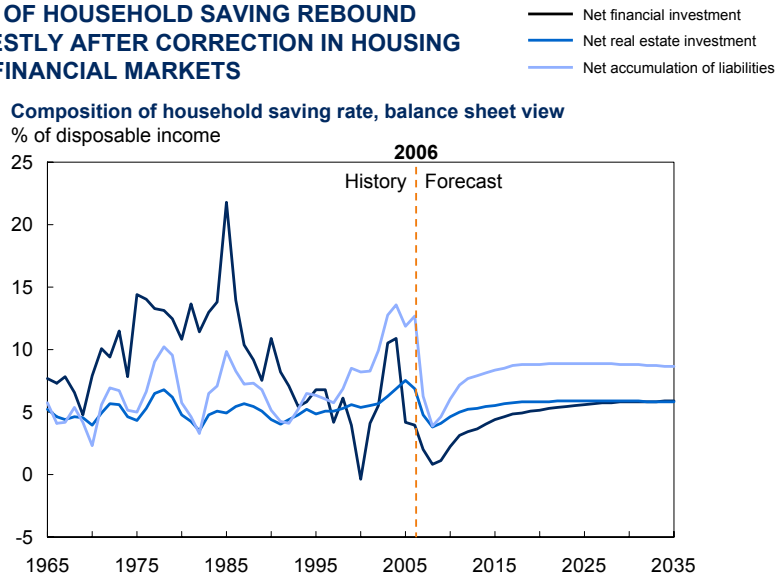
In Chapter 3, we discussed how a dollar saved can be used—it can be deposited in a bank account or used to acquire stocks, bonds, or other financial assets. It can also be used to purchase real estate assets or pay down liabilities, such as credit card or mortgage debt. In any year, households both acquire and sell assets, and add and pay down liabilities. So from the perspective of the household balance sheet, saving is defined as the net acquisition of financial and real estate assets, minus the net change in liabilities. Equivalently, savings is the net additions to net worth (see Exhibit 3.9). At the aggregate level, additions to net worth are conceptually equivalent to, and closely match, household saving measured as disposable income less consumption (see Exhibit 4.11). We use this relationship to tie our forecast of income and spending to the accumulation of household net worth.

In our forecast, we also need to know how the additions to net worth break down. The net acquisition of real estate assets is driven by our forecast of investment in residential structures. The net change in liabilities is driven by the net acquisition of real estate assets (mortgage debt accounts for more than 70 percent of liabilities), the marginal propensity to consume (to capture installment debt), and

the rate of inflation-adjusted real estate asset appreciation (to account for real increases in housing values). The net acquisition of financial assets is taken as a residual. After the near-term correction in the housing and financial markets, the net additions to assets and liabilities rebound modestly (Exhibit A.14).

Exhibit A.14

USES OF HOUSEHOLD SAVING REBOUND MODESTLY AFTER CORRECTION IN HOUSING AND FINANCIAL MARKETS



Source: McKinsey Global Institute US Consumer Model, v7.2

In addition to new savings, net worth can increase as the value of existing assets change. We capture these changes in value through rates of asset appreciation, which are driven by both unrealized and realized capital gains.[6] For our forecast, we use the last 30 years of history to benchmark our baseline estimates of financial and real estate asset appreciation. Between 1975 and 2006, combined financial assets appreciated at 1.1 percent annually adjusted for inflation, while real estate assets appreciated 1.5 percent annually (Exhibit A.15). Since this period includes the recent run-up in housing prices, we consider the 1975–2000 period as a more appropriate benchmark for real estate prices going forward. Over this shorter period, real estate appreciated 0.9 percent annually in real terms.

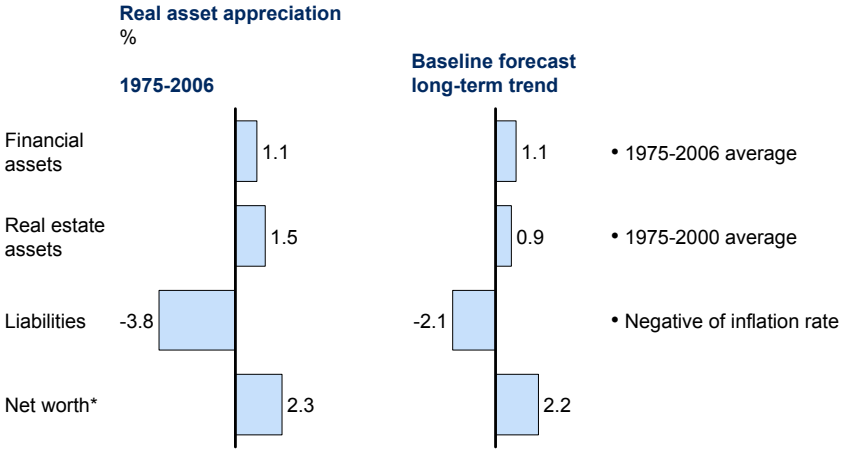
The change in value of liabilities tracks inflation. Over the past three decades, real liabilities depreciated at –3.8 percent annually, while over the same period

6 Interest and dividends are counted as part of household income and therefore captured in saving. Realized capital gains are not included in personal income in the National Income and Product Accounts because they are not income from current production. Rates of asset appreciation are estimated using the US Federal Reserve Flow of Funds data. See Appendix B for a discussion.

inflation as measured by the consumption price deflator increased 4.0 percent annually. Going forward, we use our forecast of the consumption price inflation for the real liability depreciation rate.

Exhibit A.15

ASSETS WILL APPRECIATE AT HISTORICAL AVERAGE RATES WHILE LIABILITIES TRACK INFLATION



* Appreciation rate for overall net worth is equal to the weighted sum of financial and real estate appreciation less liability appreciation. Weights equal ratio of assets and liabilities to net worth.

Source: McKinsey Global Institute US Consumer Model, v7.2

From these separate rates, we can compute the overall appreciation rate of net worth held by households. This is equal to the weighted sum of financial and real estate appreciation, less the change in value of liabilities. The weights in this calculation are equal to the ratio of financial assets, real estate assets, and liabilities to net worth. Real net worth appreciated 2.3 percent annually from 1975 to 2006 and is expected to appreciate 2.2 percent annually between now and 2035. The drop-off in inflation counterbalances the fall in real estate asset appreciation.

PROLONGED SAVING SCENARIOS

Chapter 5 outlines the impact of prolonged saving on the economy in general, and in particular the ability of Early Boomers to prepare for retirement. In what follows, we provide some more background on how these scenarios were developed and more detail on the specific economic assumptions that were used.

In developing the scenarios, we estimated what change in saving behavior would be required to have a substantial impact on the number of prepared households. We then modeled the macroeconomic impact of this change in behavior to

understand the implications for the wider economy and ensure that such changes were plausible within a consistent macroeconomic framework. In addition, we assumed that Early Boomers would act as change agents. That is, that their changes in spending and saving behavior would be carried on by subsequent cohorts. Thus, for example, the aggregate household saving rate remains elevated throughout the forecast period. The implication is that for the first decade or so of the forecast, older Boomers reap the benefits of the additional savings, but thereafter, the savings are more broadly dispersed across other cohorts.

Working longer

In this scenario, Early Boomers increase savings by extending their working lives. Increased labor force participation by 60- to 74-year-olds drives up aggregate participation in the economy (see Exhibit 5.6). In the short term, this drives up the unemployment rate relative to the baseline scenario. With rising unemployment and a stable inflationary environment, the Federal Reserve reduces interest rates to spur demand.

Businesses respond to lower rates by increasing the growth in nonresidential investment, which enables them to create the jobs necessary to employ the now larger labor force. Consumption rises slightly as the economy-wide effects of faster growth are felt. But by assumption, this spending growth is restrained, as older Boomers prepare for retirement. Lower interest rates and a weaker dollar lead to an improvement in the trade balance relative to the baseline as households and businesses shift to more domestically produced goods and services.

With stronger growth, the unemployment rate gradually falls back to trend and inflation begins to creep up, causing the Federal Reserve to reverse course. It eventually raises interest rates back to their baseline level. Inflation, while low, remains higher in the long term than in the baseline because of the faster growth in demand.

Ultimately, the rise in labor force participation and increased investment rates that stabilize the long-term rate of capital deepening produce stronger trend economic growth than in the baseline forecast (see Exhibit 5.7).

Spending less

In this scenario, Early Boomers increase savings by cutting spending. The spending reduction is small relative to the baseline in the initial years but increases over the medium term (see Exhibit 5.9). The slowdown in spending reduces growth in real GDP and raises the unemployment rate, prompting the Federal Reserve to cut interest rates.

Lower interest rates spur a mild uptick in investment, although the increase is concentrated in the residential sector, as businesses have no incentive to increase the capital labor ratio. Net export growth also increases as imports slow, spending cools, and the dollar weakers. The growth in net exports somewhat offsets the impact of slower spending growth, which eventually returns to trend.

Inflation remains low despite accommodative interest rate policy because of sluggish domestic demand. Rates eventually creep higher as the unemployment rate falls and growth returns to trend, but rates remain below the baseline.

Ultimately, the cut in spending reduces short- and medium-term growth and lowers living standards for the Early Boomers. In the longer term, the economy adjusts back nearly to trend growth as the impact of the demand shock dissipates, albeit at a lower level of real GDP (see Exhibit 5.7).

B. Technical Notes

In this appendix, we highlight the most important technical aspects of our modeling methodology and describe how we constructed our historical data set. In Appendix A, we provided a detailed overview of the macroeconomic context. Here, we focus primarily on the age group, cohort, and other distributional aspects of our model. There are four main sections to this appendix:

- **Overview of modeling structure:** Outlines the hierarchical approach we have taken to structuring our model and why
- **Building the historical database:** Describes the primary source data we collected and how we constructed the data for the model
- **Forecasting age groups and cohorts:** Explains our age group forecasting methodology and direct-mapping approach to estimating cohort behavior
- **Percentile distributions and the fixed-bracket transformation:** Outlines our approach to estimating income distribution and projecting spending by fixed-bracket income group

OVERVIEW OF MODELING STRUCTURE

Our modeling methodology is based on statistically estimated econometric equations. Guided by economic theory, these equations synthesize the historical pattern in the data into quantitative relationships that we use for both data imputation (the construction of estimates of missing historical data) and projections (the construction of scenarios about future data). The overall design of this system of equations incorporates a top-down hierarchical structure: at the top

are all-US concepts; next is a breakout of all-US variables by age group; finally, a further disaggregation of age groups into income categories.

In this section we first outline our reasons for pursuing a hierarchical structure and then explain the constraints that must be satisfied within this structure.

Hierarchical modeling structure

Our hierarchical approach takes the macroeconomic context outlined in Appendix A as given. It uses these macroeconomic benchmarks as a set of controls to ensure that the distributional data by age and by income class form an internally consistent and coherent picture of the economy. Furthermore, it enables us to understand how the evolution of age group and cohort behavior may change under alternative macroeconomic scenarios. There are three additional reasons for developing a hierarchical modeling structure.

First, higher level data are more robust. All-US data are constructed and published by official statistical agencies (such as the Census Bureau, Bureau of Labor Statistics, Bureau of Economic Analysis, and Federal Reserve Board). These data provide the best estimates of disposable income, spending, and net worth. More disaggregated data are derived from large-sample household surveys (Consumer Population Survey, Consumer Expenditure Survey, Survey of Consumer Finances). Although these household surveys provide official estimates for some variables (such as the unemployment rate), it is well known that in general, the household surveys are not completely consistent with the all-US data.[1] Typically, household surveys undercount income, expenditures, and assets relative to corresponding economy-wide measures that are based primarily on establishment surveys. There are also some definitional differences between the surveys and the all-US data that must be reconciled according to a single standard.

Second, economic theory focuses primarily on broad processes, with less emphasis on how these processes vary at finer levels of disaggregation. We have well-developed theoretical and empirical perspectives on how the macroeconomy operates and what is feasible for economic growth. Furthermore, economists and other social scientists have well-developed, empirically grounded perspectives

1 See Barry P. Bosworth, Gary Burtless, and Sarah E. Anders, "Capital Income Flows and the Relative Well-Being of America's Aged Population," Center for Retirement Research Working Paper 2007-21, December 2007, which compares income among the National Income and Product Accounts, the Current Population Survey, and the Survey of Consumer Finance. The paper pursues adjustments similar in spirit to what we have done here. See also Thesia I. Garner et al.; "The CE and the PCE: a Comparison," Monthly Labor Review, September 2006, which compares household expenditures as tabulated from the National Income and Product Accounts with that from the Consumer Expenditure Survey.

on how key behaviors and outcomes vary by age and what drives these differences. It is therefore prudent to design the model so that well-developed ideas concerning the broader evolution of economic processes provide structure for estimates at more detailed levels.

Finally, sample sizes within age and income categories are significantly smaller than for age groups as a whole. Survey data at the lowest level are generally more variable and less reliable, so controlling these to age group totals helps ensure both reasonableness and consistency.

Implementing model constraints

The hierarchal structure of the model employs a variety of constraints during the data benchmarking, imputation, and scenario construction processes to ensure internal consistency. Both source data and model estimates that describe behavior at a lower level in the hierarchy, such as by age group, must be constrained to match a given higher-level total, such as the all-US aggregate. Also, key variables are often disaggregated into subcategories, so that the sum of these subcategories must equal the household total for the category. Both of these are examples of "one-way" constraints. Additionally, some concepts must jointly satisfy two sets of constraints: Detailed categories must aggregate to household totals and, at the same time, category totals must aggregate across households types. We call this a "two-way" constraint. These constraints are always imposed in a way that preserves the primary sample information from the surveys—the relative activity across the sample distribution.

One-way constraints

We use three types of one-way constraints in the model, depending on the specific case at hand: The first is a ratio constraint, the second is a linear constraint, and the third is a chain-type constraint.

The ratio constraint ensures that nonnegative component variables sum to a given total. The need for this constraint arises because household characteristics at one level represent weighted averages of household characteristics at the level below. Household shares serve as weights. For example, estimates of average household income by age group must be constrained so their weighted average is equal to all-US average household income. If the underlying source data or first iteration model estimate does not meet this condition, all elements of the weighted average can be adjusted using a ratio or pro rata scaling method. This constraint is imposed for variables such as income, wealth, labor force, and educational attainment.

The situation is more complicated when the variables can take on negative values. In this case, use of the ratio adjustment technique would create undesirable distortions that can be avoided with an additive or linear adjustment technique. This linear adjustment allocates the difference between the actual total and the implied sum of components according to the relative size of the absolute values of the components and the sign of each component. For example, when adjusting components to agree with a sum that is larger than implied by model estimates, negative components become less negative, while positive elements become more positive. This approach is used for reconciling the components of additions to net worth.

Finally, the United States has converted its economic statistical system to chain-type measures of real output and prices.[2] Although conceptually more appropriate than the fixed-weight constructions that were previously used, they are substantially more complicated to use. Unlike quantity estimates based on fixed-weight price indices estimates based on chain-type indices are not additive. Because they are based on a nonlinear methodology using geometric averages, the sum of the components of a chain-type aggregate does not equal the aggregate itself. Fortunately, the formula used to construct chain-type measures, while nonlinear, preserves a property called "linear homogeneity." This simply means that a variant of ratio scaling can be used to adjust initial model estimates of components so they add up to a given total via the appropriate chain-type aggregation.

Two-way constraints

A two-way constraint might best be understood by thinking of the data in terms of a table with columns representing categories (such as types of consumption) and rows representing households by type (such as by age). Obviously, the sum down every column must equal the category total, while the sum across every row must equal the household type total.

Where two sets of constraints must be simultaneously satisfied, we use a technique that iteratively imposes the constraint across rows (which may yield adjustments that violate the column constraints), then the constraint across columns (which may violate the row constraints). Because all three types of constraints—ratio, linear, and chain-type—are linear or linear homogenous, this iterative process converges to a set of table cells that jointly satisfy both row and column constraints.

2 Bureau of Economic Analysis, "A Guide to the National Income and Product Accounts of the United States," 2007; Karl Whelan, "A Guide to the Use of Chain Aggregated NIPA Data," Federal Reserve Board, June 2000.

BUILDING THE HISTORICAL DATABASE

For this project, we have constructed a complete "rectangular" database for all model variables containing annual data from 1962 to 2006. The starting point for this database is the macroeconomic and household survey information that we collected from primary sources. In this section, we will give an overview of the data we use and provide examples that demonstrate how we constructed the database.

Primary source benchmark data

Our macroeconomic and household survey information is obtained directly from official US government statistical agencies. The macroeconomic information is officially published data, as is a subset of the household data by age. There are four main sources for this information. A limited number of supplementary sources are also used where required.

- **The Board of Governors of the Federal Reserve System** (Federal Reserve) publishes the Flow of Funds Accounts (FFA), which provide a detailed accounting of the aggregate household balance sheets, including financial assets, real estate assets, and liabilities. In addition, these accounts supply information on the net acquisition of assets and liabilities, which specify how new savings flows result in the accumulation of net worth. Using this information, it is also possible to calculate implicit rates of asset revaluation, which captures the impact of realized and unrealized capital gains. The Federal Reserve also provides the interest rate data we use in the model.

- **The Bureau of Economic Analysis** (BEA) publishes the National Income and Product Accounts (NIPA), which provide a detailed picture of aggregate household income and spending. It also provides detailed-spending-category specific price deflators. As noted above, the NIPA has been converted to chain-type measures of real output and prices.

- **The Bureau of Labor Statistics** (BLS) provides historical labor force data, both in the aggregate and by age group. This includes data on full-time and part-time employment, self-employment, and unemployment. The BLS also provides historical and forecast data for the noninstitutional civilian population by age group. These data are based on official tabulations of the Current Population Survey (CPS) discussed below. These official tabulations use the complete survey detail from the CPS, which includes information not available in the public-use files. The BLS also provides employment by industry from its establishment survey.

- **The US Census Bureau** provides historical and forecast population data both in the aggregate and by age. It also provides aggregate data on the number of households, average household size, average number of children per household, and educational enrollment. Finally, it provides age-group-specific historical data on the number of households and on educational enrollment.

To supplement these main sources, we obtain graduation rates from the National Center for Education Statistics; out-of-pocket medical spending ratios from the Centers for Medicare and Medicaid Services; equity market data from Standard & Poor's; and median housing price data from the Office of Federal Housing Enterprise Oversight.

Tabulated household survey data

To complete our primary source inputs, we tabulate household-specific information directly from three official household surveys. For all surveys available since 1962, we estimate average (head of) household economic and demographic characteristics for 12 age groups.[3] This provides a nationally representative sample of all households headed by individuals 16 and older. Within each age group, we also tabulate average household characteristics across 12 income percentiles.[4]

The Current Population Survey (CPS)

The Annual March Supplement of the CPS published by the Bureau of Labor Statistics contains detailed household demographic and income information. The CPS defines a household as

> All the people who occupy a housing unit. A house, an apartment or other group of rooms, or a single room, is regarded as a housing unit when it is occupied or intended for occupancy as separate living quarters; that is, when the occupants do not live and eat with any other persons in the structure and there is direct access from the outside or through a common hall. A household includes related family members and all the unrelated people… A person living alone in a housing unit, or a group of unrelated people sharing

3 The age groups we tabulate are 16-24, 25-29, 30-34,35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-69, 70-74, 75 and above.

4 The income percentiles we tabulate are 5% and below, 5-10%, 10-20%, 20-30%, 30-40%, 40-50%, 50-60%, 60-70%, 70-80%, 80-90%, 90-95%, 95% and above (i.e., top 5%); For simplicity, in the model itself, we work with 9 percentiles, combining the 5% and 5-10%; 20-30% and 30-40%; 60-70% and 70-80% percentiles.

a housing unit such as partners or roomers, is also counted as a household. The count of households excludes group quarters.[5]

For demographics, we tabulate household and individual information on the labor force, full-time, part-time, and self-employment; unemployment; the number of households, average household size, average number of children per household; marital status by household; educational attainment by household; and the noninstitutional civilian population.

The CPS is also the source for household income information. A complication here is that the CPS public files use "top codes" in all income categories to ensure the confidentiality of survey participants. That is, in each year, the CPS sets a maximum value for income, above which they will report an income top code, rather than actual surveyed household income. Because top codes will distort the distribution of income, we elect to set all top codes equal to "not available" at the finest level of income detail available. Thus, when we tabulate income into three aggregates—earnings (including self-employment earnings); interest, dividends, and rents (including business income); and transfers from the government—we will get "not available" in all income percentiles for which there is a top code. This occurs in approximately 60 percent of the observations in the 95th percentile for these three measures of income. As discussed below, we estimate these missing values for the historical period.

At the time we tabulated data for this study, the CPS was available for the years 1962 to 2006. We access the CPS using the Unicon CPS Utilities database covering these years.[6] The Unicon database provides clear documentation on how to make consistent tabulations across all survey years.

The Consumer Expenditure Survey (CEX)

The CEX, which is also published by the Bureau of Labor Statistics, collects data on the basis of consumer units rather than households, as in the CPS. The most salient difference between these definitions is the treatment of unrelated individuals living in a shared housing unit. Under the CPS, they could be classified as a household depending on how their housing unit is structured, while under

5 Since 1983, "group quarters were defined in the Current Population Survey as noninstitutional living arrangements for groups not living in conventional housing units or groups living in housing units containing ten or more unrelated people or nine or more people unrelated to the person in charge. (Prior to 1983, group quarters included housing units containing five or more people unrelated to the person in charge.) Examples of people in group quarters include a person residing in a rooming house, in-staff quarters at a hospital, or in a halfway house. Beginning in 1972, inmates of institutions have not been included in the Current Population Survey." http://www.census.gov/population/www/cps/cpsdef.html

6 http://www.unicon.com/

the CEX they would be separate consumer units if they are "financially independent."[7] For our purposes, these definitions are similar and we do not distinguish between consumer units and households.

The CEX is used to tabulate the household spending data required to construct the 11 broad NIPA spending categories described in Appendix A. We also tabulate household tax and personal interest expense information to estimate household disposable income and saving. Our tabulations of the CEX are based on the Interview Survey, which captures approximately 95 percent of all spending in the survey. Because we are tabulating across income percentiles, we base our estimates for years prior to 2004 on households that were "complete income reporters." Although complete income reporters do not necessarily provide values for all major sources of income, "across-the-board zero income reporting" was considered invalid by the BLS, and these consumer units are categorized as incomplete reporters.[8] In 2004, the CEX began to provide imputations of household income so all respondents could be tabulated.

At the time we tabulated data for this study, the CEX was available for the years 1972, 1973, 1980, 1981, and 1984–2004. We access the CEX data from databases provided directly by the Bureau of Labor Statistics. Based on the CEX documentation, and conversations with the BLS, we make appropriate adjustments across survey years to account for changes in survey design and the way in which survey results are presented.

The Survey of Consumer Finance (SCF)

The SCF, published by the Federal Reserve, collects data on the basis of families.[9] But this definition is very similar to the CPS definition of households, which includes both "family households" and "nonfamily" or single households. So, as with the CEX, we use these terms interchangeably.

7 Specifically, "a consumer unit comprises either: (1) all members of a particular household who are related by blood, marriage, adoption, or other legal arrangements; (2) a person living alone or sharing a household with others or living as a roomer in a private home or lodging house or in permanent living quarters in a hotel or motel, but who is financially independent; or (3) two or more persons living together who use their income to make joint expenditure decisions… To be considered financially independent, at least two of the three major expense categories [housing, food, other living expenses] have to be provided entirely, or in part, by the respondent." http://www.bls.gov/cex/csxgloss.htm

8 http://www.bls.gov/cex/csxgloss.htm

9 Specifically, in the "SCF, a household unit is divided into a 'primary economic unit' (PEU)—the family—and everyone else in the household. The PEU is intended to be the economically dominant single individual or couple (whether married or living together as partners) and all other persons in the household who are financially interdependent with that economically dominant person or couple." See Brian K. Bucks, Arthur B. Kennickell, and Kevin B. Moore, "Recent Changes in U.S. Family Finances: Evidence from the 2001 and 2004 Survey of Consumer Finances," Federal Reserve Bulletin, 2006, p. A36.

The SCF is the source for household assets and liabilities, and also a secondary source for household income information. To accurately measure the financial characteristics of households that are "broadly distributed in the population (such as homeownership) and on those that are highly concentrated in a relatively small part of the population (such as closely held businesses) … the SCF employs a sample design … consisting of two parts: a standard, geographically based random sample and a special oversample of relatively wealthy families."[10] Furthermore, unlike the CPS, the SCF does not top code its income data, so we can leverage the SCF to help estimate the upper tail of the household income distribution. This is particularly helpful given the oversample of wealthy families.

Although we ultimately collapse household financial information into three categories—financial assets, real estate assets, and liabilities—we tabulate the data at a more detailed level to make adjustments for consistency with the FFA, which we detail in the next section.

At the time we tabulated data for this study, the SCF was available for the years 1962, 1983, 1989, 1992, 1995, 1998, 2001, and 2004. These survey data were obtained directly from the Federal Reserve and tabulated by the McKinsey Financial Services Practice.

Benchmarking household surveys to all-US totals

For the reasons discussed above, we use a variety of constraints to benchmark the household survey tabulations to official data and to ensure internal consistency. Sometimes (as in employment) there is a one-to-one match between the concepts in the survey and benchmark data. When there is not, we develop the most appropriate benchmark possible, given the available information. To illustrate this process, we provide examples for consumer spending and household net worth.

Consumer spending

There are some definitional and coverage differences between the consumer spending categories defined in NIPA and those collected in the CEX. For example, because the CEX is a household survey it typically reflects only out-of-pocket spending, while NIPA is based on an establishment survey and includes adjustments and imputations for spending that happens on behalf of consumers (such

10 *Ibid,* p. A3.

as medical spending by insurance companies).[11] NIPA also includes spending by nonprofits. Finally, the CEX collects information in current dollars, so real measures of spending must be constructed.

Definitional differences. As discussed above, we have chosen to standardize on NIPA definitions of consumer spending. To match these definitions as closely as possible, we tabulate detailed information from the CEX. When definitional differences exist, we assume that the distribution of spending we cannot identify in the CEX follows the same distribution as the spending for which we have data. For example, for medical care, we tabulate the CEX data on health insurance, medical services, medical supplies, and prescription drugs. Each of these categories is then benchmarked to the corresponding NIPA spending category—first by age, and then within age group, by income. But because the CEX data capture only out-of-pocket spending, we assume that spending that occurs on behalf of households in each of these categories follows the same distribution as the out-of-pocket spending.

Free financial services. The consumption of free financial services in the NIPA is an imputation constructed by the BEA to estimate the value of services provided in-kind by financial institutions (such as services from bank tellers). There is no comparable category in the CEX. Because of this, we have subtracted this item from total personal consumption expenditures. This reduces spending by only about 2 percent. Acknowledging that the BEA makes a corresponding imputation on the income side of the accounts, we make an offsetting adjustment to personal income. This enables us to preserve the personal saving rate as published.

Nonprofit institutions. The case of nonprofits is not as simple to resolve. Although they also account for approximately 2 percent of final expenditures in the personal sector, available data on the breakout of nonprofits from households is available only from 1992.[12] Furthermore, because their contributions to personal income do not match their contributions to final consumption expenditures, adjusting for nonprofits would alter the commonly reported personal saving rate. Because we have no information on which to make estimates before 1992 or to forecast nonprofit behavior going forward, we have not adjusted for nonprofits in the income and spending data.

11 A recent comparison found that when all items are compared across the two sources, the CEX captured only 60 percent of total spending in 2002. When items deemed strictly comparable were analyzed, this ratio rose to 81 percent. These ratios have been declining for as long as these comparisons have been made, over the past one to two decades. See Garner et al., *op. cit.*

12 See NIPA Table 2.9: Personal Income and Its Disposition by Households and by Nonprofit Institutions Serving Households. http://www.bea.gov/national/nipaweb/Index.asp

Real spending by age and age-income groups. The CEX provides estimates of household spending in current dollars, so we must construct real spending by household type (by age, and by age and income). We assume that all household types face the same all-US prices for each type of expenditure (such as food and clothing). In addition, given our top-down structure, we also assume that all household types face the same all-US total consumption price deflator.

By assuming that all household types face the same deflators, it is straightforward to ensure that total real spending and real spending by type of good aggregate to the next level in our hierarchy (all-US for spending by age groups; age group spending for age by income groups). However, we must also ensure that real spending across goods aggregates properly for each household type, taking into account the chain-type construction of the real quantities. Thus, to estimate real spending by type of good and type of household consistently, we use a two-way constraint (see above)—iteratively imposing a chain-type constraint to ensure aggregation by household type, and a ratio constraint to ensure aggregation by type of good.

After this procedure is complete, we also want to recover estimates of nominal spending. Given our construction of real spending, note that total nominal spending can be calculated in two ways: as total real spending times the all-US total consumption price deflator; and as the sum of real spending by type of good times the all-US price deflator for each good. However, these two calculations do not produce precisely the same result. This is because, implicitly, there is a different chain-type total consumption price deflator for each household type that reflects its mix of expenditures. Therefore, we estimate nominal spending with an additional two-way constraint. Taking nominal spending by household type (measured as total real spending times the all-US total consumption price deflator) and total spending by type of good (measured as total real spending by type of good times the all-US deflator for that good), we iteratively impose ratio constraints across both margins to ensure aggregation.

Household net worth

Though similar in spirit to consumer spending, the FFA provides different information than the SCF.

- The FFA captures both households and nonprofits.
- The FFA includes tangible assets not captured by the SCF.
- The SCF covers only assets that are directly controlled by households, while the FFA also includes assets that are attributable to households.

- The two sources' categorization and treatment of detailed asset classes can be different.

- The SCF is a household survey typically undercounting asset holdings, while the FFA is a survey of financial institutions.[13]

We address the first three issues by tailoring the benchmark we use from the FFA. The fourth issue requires adjustment to categories in the SCF. Once these adjustments are made, the final issue is resolved by benchmarking the SCF to the adjusted FFA using the constraints described above.

Nonprofits and tangible assets. Adjusting benchmark assets and liabilities for nonprofits is important because of their size (for instance, including nonprofits would boost household real estate assets by approximately 10 percent). Thus, we exclude household real estate and any financial assets and liabilities that the FFA identifies as belonging to nonprofits—open market paper, municipal securities liabilities, trade payables, and commercial mortgages.[14] We also exclude from tangible assets the equipment and software held by nonprofits and the consumer durables held by households because they are not captured in the SCF and they are counted as spending, not assets, in the NIPA.

Reserves held on behalf of households. The FFA attributes to households the reserves held on their behalf for defined benefit (DB) pension plans, annuities, and life insurance polices, while the SCF counts only assets directly controlled by households.[15] The FFA provides separate information on life insurance and annuity reserves, and we exclude these from household assets. Adjusting for DB pension reserves is more complex because the reserves are often combined with defined contribution (DC) pensions—a crucial component of household wealth and one captured by the SCF. We estimate DC pensions by type of pension to isolate the DB pension reserves:

- **Private pension fund reserves.** As of 1985, the FFA allocates the financial assets of the private pension funds between DB and DC plans. Prior to 1985, we estimate the split using straight-line extrapolation.

13 See Rochelle L. Antoniewicz, "A Comparison of the Household Sector from the Flow of Funds Accounts and the Survey of Consumer Finances," Federal Reserve Board of Governors, October 2000.

14 FFA Table L100a shows financial instruments that are 100 percent owned by nonprofits, which are the ones we exclude. Between 1987 and 2000, L100a included additional detail that provided nonprofit holdings across instruments even if they were not entirely held by nonprofits.

15 The only exception would be whole life insurance policies.

- **Pension funds reserves in life insurance companies.** These are annuity reserves held by life insurance companies, excluding unallocated contracts held by private pension funds, but including annuities held by individual retirement accounts (IRA), 403(b), 457, and private pension funds. Because this excludes unallocated contracts, we include this fully into the scope of our analysis.[16]

- **Pension funds reserves in state and local government employee retirement funds.** These can fully be considered as DB plans—457 plans or any other plans supported solely by employee contribution are not included in this reserve.

- **Pension funds reserves in federal government retirement funds.** These include the Thrift Savings Plan (TSP), which was introduced in 1987. We use the TSP financial statements to estimate the DC portion of this reserve.

Mismatches in asset categorization. By working initially with seven broad categories of assets and two categories of liabilities, we have been able to identify appropriate adjustments to the FFA and avoid large mismatches between SCF and FFA. In addition, to sharpen the matches across these databases, we make two adjustments to the SCF data: Land contract and mortgage assets are moved from real estate assets to credit market instruments, and rental housing assets are moved from real estate assets to business equity.[17]

Even after these adjustments, potential differences remain in two areas. One is equity in corporate business not traded in the capital market. While the SCF treats this as business equity and the FFA treats it as stocks, we have not attempted to make an adjustment given that uncertainty around estimates of business equity. The second is the treatment of IRA/Keogh assets—which is broken into underlying investment vehicles in FFA but treated as a separate asset category in SCF. At the detailed level, we chose to merge IRA/Keogh into the broad category of mutual fund, retirement, and other managed assets. Because we treat all financial assets together within the model, these distinctions will have no impact on our results.

16 This category is in fact a combination of annuities held by retirement plans and directly by individuals. As of 2005, approximately one-third of it was attributable to annuities held through retirement plans and two-thirds to directly held annuities. Strictly speaking, the latter is not part of a DC plan; however, as we merge asset categories to create broader categories, both annuities and DC plans fall in the "mutual fund/retirement/other managed assets" category, making this treatment acceptable.

17 Equity in noncorporate business concept in FFA is derived as a residual—which explains this categorization. Note that while rental assets are moved to business equity, the corresponding liability remains in mortgage. See Antoniewicz, *op. cit.*

Model-based imputations

A distinctive feature of our approach is to use model-based imputations to fill missing data. Because the household surveys do not provide complete coverage over the desired historical period, we construct model-based imputations in two steps. First, instead of using a linear or other mechanical imputation technique, we develop statistically estimated econometric equations, which we use to backcast estimates of historical values. Second, these estimates are then spliced into the actual historical observations and constrained using the same techniques described above.

In this section, we describe how we estimate the upper tail of the income distribution as well as the components of net worth by age.

Estimating the 95th percentile of the income distribution

As noted above, the CPS income data were tabulated (for each age group and income category) by percentile. For the 95th percentile group, we replaced top-coded observations with "not available." Because the SCF is not top coded, we use information from the upper tail of the income distribution tabulated from the SCF to impute corresponding missing values in CPS data whenever possible.

The CPS and SCF samples, of course, represent the same sample universe (the US household population) with sample weights based on the most recent US Census. So, in principle, the observations should be roughly comparable, at least within the bounds of sampling error. Indeed, examination of the percentile data for the CPS and SCF tabulations indicated reasonable agreement, with mean income within deciles typically within 10 percent.

We therefore imputed missing observations in the 95th percentile of the CPS data by applying the ratio of the mean in the 95th percentile to the mean in the 90th percentile in the SCF data (by age and income type) to the mean of the 90th percentile group in the corresponding CPS data. Because there are only eight SCF through 2004 and we use 44 CPS March Supplements, approximately 18 percent of missing 95th percentile data were actually imputed using this methodology. However, these data points provided very useful benchmarks for our model-based imputations.

Once we have combined information from the CPS and SCF, we estimate econometric equations for each component of income. For imputations, all independent variables in the regressions must span the entire sample space to be imputed. As an example, consider household earnings for the 95th percentile.

We estimate a pooled time series regression across age groups with age group earnings (measured relative to average earnings for the whole age group) as the dependent variable.[18] Relative educational attainment and relative employment are independent variables with common coefficients, and average earnings per household for the entire economy is an independent variable with age-specific coefficients. In addition, we include age group fixed effects. Once this model is estimated, we backcast it over the entire historical period. Where we have missing data, these backcasts are appropriately spliced in with the actual data.

Estimating the stocks and flows of assets and liabilities by age

Similar to the process just described for earnings, we develop a set of model-based imputations for the stocks of assets and liabilities held by households in the years for which we do not have information from the SCF. Next, we estimate the net acquisition of assets and liabilities by household age group that are analogous to the aggregate measures found in the FFA. As discussed in Chapter 3, the net acquisition of assets and liabilities is the balance-sheet equivalent of household saving measured by disposable income less consumption. To estimate these asset flows by household age group, we create an additional set of (non-stochastic) model-based imputations that account for the passage of cohorts through our standard age groups, a process that we now describe.

As discussed in Appendix A, the real value of financial and real assets can increase either because new savings are used to purchase additional assets or because the real value of existing assets increases. Similarly, real liabilities can increase because new liabilities are taken on or because the real value of existing liabilities changes.

For example, at the aggregate level, real financial assets per household at time t, $asfrh_t$ follow the accumulation equation

$$asfrh_t = dasfrh_t + (1 + rasfr_t)asfrh_{t-1}\left(h_{t-1}/h_t\right)$$

where $dasfrh_t$ equals the net acquisition of real financial assets per household, $rasfr_t$ equals the real rate of financial asset appreciation, and h_t is the number of households. So, given values of stocks, we construct flows accordingly

$$dasfrh_t = asfrh_t - (1 + rasfr_t)asfrh_{t-1}\left(h_{t-1}/h_t\right)$$

18 For a more detailed example of our econometric strategy for estimating age specific distributions, see "Estimate empirical models" in the next section. The same approach is applied for percentile distributions within age groups.

At the age group level, we must also account for the fact that households keep their assets as they age—assets are cohort-specific.[19] Because we do not have panel survey data on asset accumulation, we must estimate how assets are "handed off" between age groups as cohorts age.

We approach this problem the same way we approached the problem of cohort aggregation discussed below.[20] That is, we develop a set of population weights to estimate the amount of assets either "leaving" or "entering" successive age groups over time. For these estimates we assume that the assets held within each five-year age group are proportional to the population weights of each single age in that group.

Because the 16–24 age group is the youngest age group in our sample, new assets are formed either through new saving or asset revaluation. But as the 24-year-olds turn 25 and enter the next age group, they take their assets with them. If we let *i* represent the 16–24 age group, we can estimate asset accumulation for this age group as

$$asfrh_{i,t} = dasfrh_{i,t} + (1 + rasfr_t)(asfrh_{i,t-1} - w_{i,t-1}\, asfrh_{i,t-1})\left(h_{i,t-1} / h_{i,t}\right)$$

where $dasfrh_{i,t}$ equals the real net acquisition of financial assets per household for age group *i*, $rasfr_t$ equals the real rate of financial asset appreciation, $w_{i,t}$ equals the share of age group *i* in any period *t* that advances to the next age group, and $h_{i,t}$ is the number of households.[21] So, as above,

$$dasfrh_{i,t} = asfrh_{i,t} - (1 + rasfr_t)(asfrh_{i,t-1} - w_{i,t-1}\, asfrh_{i,t-1})\left(h_{i,t-1} / h_{i,t}\right)$$

For households in age groups 25–29 to 70–74, we must account for cohorts entering and leaving the age groups. If we let *i* represent the current age group, and *j* represent the preceding age group (e.g., the age group pair 25–29 and 16–24), it is possible to show that

$$dasfrh_{i,t} = asfrh_{i,t} - (1 + rasfr_t)\left(asfrh_{i,t-1} - w_{i,t-1}\, asfrh_{i,t-1} + w_{j,t-1}\, asfrh_{j,t-1}\left(h_{j,t-1} / h_{i,t-1}\right)\right)\left(h_{i,t-1} / h_{i,t}\right)$$

19 For income percentiles within age groups, we estimate the evolution of assets and liabilities using an econometric approach that predicts the ratios of assets and liabilities to income.

20 In next section, see "Construct cohorts from age groups."

21 We assume that all age groups face common rates of asset and liability revaluation derived from FFA. As discussed in Appendix A, the overall revaluation of net worth is equal to a weighted average of assets less liability revaluation rates. Therefore, even though age groups face common rates of revaluation, since they hold different portfolios, they will also have unique rates of revaluation for overall net worth.

Finally, for the age group 75 and above, we have only new cohorts entering.

$$dasfrh_{i,t} = asfrh_{i,t} - (1 + rasfr_t)\left(asfrh_{i,t-1} + w_{j,t-1}\, asfrh_{j,t-1}\left(h_{j,t-1} / h_{i,t-1}\right)\right)\left(h_{i,t-1} / h_{i,t}\right)$$

These flows are constrained to the aggregate flows by asset type as published in the FFA.[22]

FORECASTING AGE GROUPS AND COHORTS

To highlight the most important elements of our economic model, we now explain our approach to estimating and forecasting age groups and cohort behavior. We demonstrate how our approach allows us to view life-cycle behavior in the time domain and by age and enables us to isolate the impacts of cohort-specific behavior from the effects of the economy. Furthermore, we show how our cohort perspective enables us to use the Theil index to provide a different perspective on the evolution of inequality in the United States.

The synthetic panel approach

One of our primary objectives in this study is to provide estimates of life-cycle income, spending, and wealth accumulation across cohorts. In our previous work, we estimated cohort-specific life-cycle curves using a "synthetic panel" approach.[23] In this approach, we use household survey information to calculate the average income of households by, for example, five-year age groups. With cohorts defined by birth years, we can observe the average income of each cohort every five years and therefore trace out the evolution of their income over the historical period. Because we observe each cohort over only a limited part of their life cycle (e.g., Early Boomers have an average age of 55 in 2005), the synthetic panel approach pools observed income across cohorts and estimates a shared life-cycle curve over all ages represented in the sample. More specifically, we estimate the parameters of a fifth-degree polynomial with fixed effects for each cohort. The fitted values of this polynomial (including the cohort-specific fixed effects) provide estimated household income by age—the income life-cycle curve.

22 Note that a very small proportion of flows constructed with this methodology turned out to be implausibly large. Outliers were capped from below at –95 percent of income and the discrepancy carried as an exogenous term in the flow accounting presented above.

23 See McKinsey Global Institute Report, "The Coming Demographic Deficit: How Aging Populations Will Reduce Global Savings," December 2004; this approach was developed by Angus S. Deaton, "Panel Data from Time Series of Cross-Sections," *Journal of Econometrics,* 1985, vol. 30, pp. 109-26. See also Orazio Attanasio, "A Cohort Analysis of Saving Behavior by U.S. Households," *Journal of Human Resources*, 1998, vol. 33 (Summer), pp 575-609; Axel H. Börsch-Supan, ed., *Life-Cycle Savings and Public Policy: A Cross-National Study of Six Countries,* Academic Press (Elsevier), 2003.

This approach poses three important challenges. First, we are interested in understanding differences in life-cycle behavior across cohorts. This is not possible using the synthetic panel approach because it assumes a common life-cycle pattern across cohorts. Second, because the life-cycle curve is assumed to follow a polynomial, this approach does not provide any empirical insight into what is driving life-cycle behavior. It demonstrates only that there is a life-cycle pattern in the data. Finally, we are interested in understanding how the economy has influenced the Boomer cohort and how the Boomers reacted to the economic circumstances in which they found themselves. But the fixed-cohort effects in the synthetic panel approach conflate the impact of the economy on individual cohorts' income, with any behavioral differences that might exist across cohorts. This is because the life-cycle curves in the synthetic panel approach are estimated across ages, and that birth year, age, and time are linearly dependent. That is, the impact of economic growth cannot be separately identified from any differences in response to economic circumstances across cohorts.

An alternative approach—Direct cohort mapping

We have developed an approach we call "direct cohort mapping" to estimate cohort-specific life-cycle curves to address these challenges. Our strategy has three elements: estimate empirical models of economic outcomes; forecast these outcomes; and then construct cohorts. After outlining these elements, we will provide two examples of how this works in practice. Then, in the next section, we will outline how we have decomposed the cohort effects from overall economy effects.

Estimate empirical models

The first element of our strategy is to develop empirical models that can explain the distribution of economic outcomes across age groups. We use pooled time series cross-section techniques to develop these reduced-form econometric models. We pool across age groups over time—rather than across cohorts by age as in a synthetic panel—to capture the time series element of household behavior and the distribution across households by age.

Within the top-down framework described above, the dependent variable in our specifications is always formulated as the average per household for an age group relative to the average per household across age groups (e.g., the average earnings of households headed by 50- to 54-year-olds, relative to the average earnings of all households in a given year). The independent variables are similarly specified (e.g., average educational attainment of 50- to 54-year-old

households, relative to the average educational attainment of all households in a given year). We include age group fixed effects in all specifications.

In addition to age group and time series effects, we are interested in estimating the impact of cohorts as they move through age groups over time. We do this by constructing "cohort effects" using a lagged dependent variable with a specific time series and age group lag structure. We know that any cohort that has an average age of 55–59 in a given year was part of the 50–54 age group five years earlier. Thus, the cohort effect for the 55–59 age group will be made up of a five-year lag of a 50–54 age group variable. By constructing these cohort effects for all age groups, we can include them in our pooling regression framework. Like other independent variables, the cohort effects are specified as age group relative to economy-wide household averages.

The intuition behind the structure of these cohort effects is straightforward: If cohorts possess specific attributes that they carry over time, these attributes should help in predicting the outcomes for that cohort today once we have controlled for time series and age group effects. For example, earnings should be path-dependent—the relative earnings of 55- to 59-year-old households today should be dependent on their earnings five years earlier when their average age was 50–54. Similarly, the level of educational attainment for any cohort today is dependent not only on enrollment and graduation rates, but also on the level of attainment these households achieved at earlier ages.

We found significant cohort effects in variables that we would naturally think of as having persistence—earnings per household, labor force participation, percentage of married couple households, and educational attainment at all levels. Furthermore, as we shall see below, cohort effects are a critical component of capturing the evolution of net worth by age.

Forecast economic outcomes by age group

Once we have estimated empirical models for the variables of interest, they are compiled into our econometric forecasting framework. The top-down approach we have adopted enables us to project the evolution of age group behavior within the context of our macroeconomic framework. The combined history and forecast for all the age groups provides us with the ability to trace out the complete life cycles of each cohort independently.

Construct cohorts from age group outcomes

Because our cohorts are defined in 10-year birth increments, and we work with five-year age groups, there are some years where age groups and cohorts overlap perfectly. For other years, cohorts span multiple age groups. To estimate cohort behavior in these years, we develop a set of weights, based on the history and forecast of single age populations provided by the US Census. These weights are then used to construct cohort averages across age groups.

The best way to explain this approach is through an example. In 2004, Early Boomers were between 50 and 59 years old. This age range spans our 50–54 and 55–59 age groups exactly. Thus, in 2004, the average household income of Early Boomers is equal to the weighted average of income per household in these two age groups. One year later, the Early Boomers still spanned the 55–59 age group, but also spanned ages 51–53 from the previous five-year age group, and age 60 from the next five-year age group. To compute average household income for Early Boomers in 2005, we first compute the population share of 50- to 53-year-olds relative to the 50–54 five-year age group. Similarly, we compute the population share of 60-year-olds in the 60–64 age group. We then use these weights to estimate what share of income and households from these five-year age groups the Early Boomers comprise. Those shares, combined with the income and households from the 55–59 age group, provide our complete estimate.

Ideally, these weights would be based on single-year household shares. However, the US Census does not provide forecasts for households by single age, and developing these forecasts independently was not within the scope of this study. Furthermore, we believe that using the population shares provides a very good approximation for the evolution of cohort behavior over time. First, there is no approximation every five years, which provides anchor points for the path of cohort behavior. Second, in every intervening year, we use one complete five-year age group. Third, in two out of the four intervening years, we use one complete five-year age group, and approximately 80 percent of the adjacent age group.

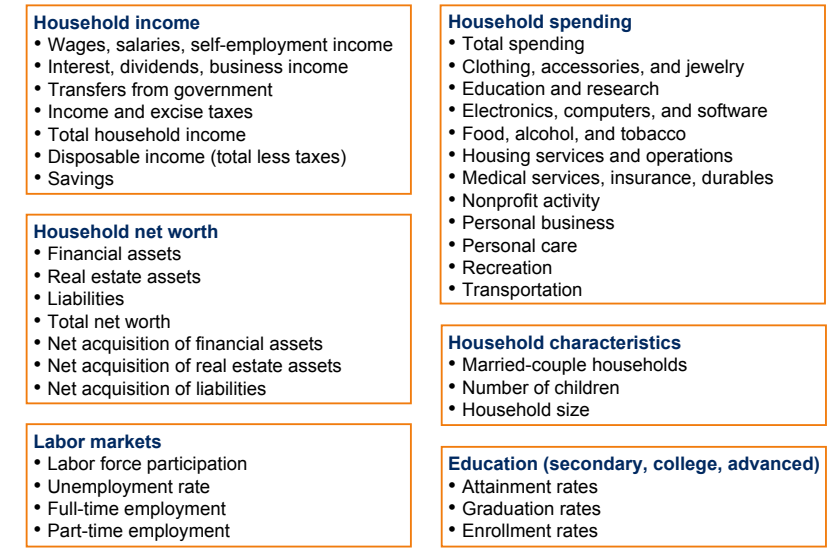
Example 1: Earnings per household

In Exhibit B.1, we list all the economic and demographic concepts that we model and forecast at the age group level.[24] To illustrate our approach, we will review our specification for the age group distribution of earnings and show how the results of this modeling follow through to the derivation of life-cycle curves.

24 Note that the age group distributions of economic and demographic variables are highly simultaneous and therefore solved numerically within our model framework.

Exhibit B.1

THE AGE DISTRIBUTION IS ESTIMATED ACROSS MANY ECONOMIC AND DEMOGRAPHIC VARIABLES



Source: McKinsey Global Institute US Consumer Model, v7.2

In Table 1, we show the specification we employ to estimate the distribution of earnings. Note first that the age group fixed effects have the expected sign and follow a life-cycle pattern—relative earnings for younger and older age groups is lower than average, while earnings for those in their peak earning years are higher. Second, we find that higher rates of full-time employment, part-time employment, and higher educational attainment increase relative earnings. Third, an increased share of 16- to 24-year-olds in the population reduces earnings for that group. Finally, the earnings cohort effect is significant—cohort earnings show persistence.

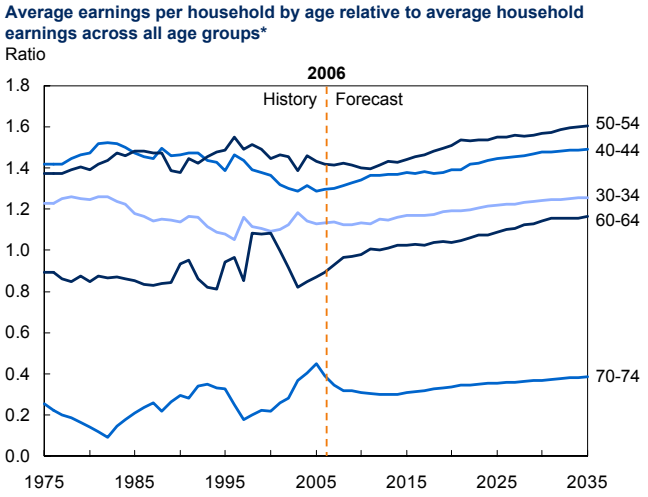
Table 1: Pooled Regression for the Distribution of Earnings

Dependent Variable: Relative Wages & Salaries Per Household			
Method: Pooled EGLS (cross-section SUR)			
Sample (adjusted): 1967 to 2005			
Included observations: 39 after adjustments			
Cross-sections included: 12			
Total pool (balanced) observations: 468			
Linear estimation after one-step weighting matrix			
Variable	**Coefficient**	**t-Statistic**	**Prob.**
Relative Part-Time Employment	0.038	1.970	0.050
Relative Full-Time Employment	0.287	9.976	0.000
Relative Higher Education Attainment	0.288	21.980	0.000
Cohort Earnings Effect	0.273	13.898	0.000
Age group specific effects			
Share of working age population for 16-24	-0.196	-2.999	0.003
Age group fixed effects			
16T24–C	-0.284	-2.621	0.009
25T29–C	-0.096	-6.041	0.000
30T34–C	-0.026	-2.493	0.013
35T39–C	0.061	5.568	0.000
40T44–C	0.108	8.589	0.000
45T49–C	0.173	11.183	0.000
50T54–C	0.146	11.662	0.000
55T59–C	0.100	9.973	0.000
60T64–C	-0.023	-1.434	0.152
65T69–C	-0.441	-9.365	0.000
70T74–C	-0.393	-4.759	0.000
75A–C	-0.732	-6.213	0.000
Weighted Statistics			
R-squared	0.958769		3.750453
Adjusted R-squared	0.957306		7.830038
S.E. of regression	0.993868		445.4858
F-statistic	655.4526		1.101208

With this distributional model of earnings, accompanying equations for employment and educational attainment, and projections of these variables from our macroeconomic forecast, we can project earnings by age group (Exhibit B.2). Combining the distribution of earnings with the distribution of interest, dividends, rents, and transfers provides our estimate of the age-group distribution of personal income. Subtracting our estimates of age group-specific taxes enables us to derive the distribution of disposable income. Based on this distribution, we calculate the life-cycle curves for disposable income as described above. These life-cycle curves can be viewed over time (see Exhibit 2.1). Because we know the age of each cohort at every point in time, we can also map this time series representation into the age domain. This enables us to easily compare differences in disposable income per household at the same age (see Exhibit 2.3).

Exhibit B.2

RELATIVE EARNINGS RISE AND FALL WITH THE EARNINGS LIFE CYCLE



* Earnings include total compensation and self-employment income.
Source: McKinsey Global Institute US Consumer Model, v7.2

Example 2: Evolution of assets and liabilities by age

As discussed in Chapters 3 and 4 and Appendix A, the net acquisition of assets less the net acquisition of liabilities equals the additions to net worth. Additions to net worth are conceptually equivalent and closely track savings defined as disposable income less consumption (see Exhibit 4.10). At the aggregate level, there is a unitary elasticity between savings and additions to net worth. Similarly, we use our age group forecasts of saving to drive our forecasts of additions to net worth. Using the same pooled time series regression framework just described,

we impose a unitary elasticity between age group savings and additions to net worth and estimate age group fixed effects.

To forecast asset and liability accumulation by age, we use the cohort-adjusted updating relationship derived above, which takes as inputs the forecasts of net acquisition of assets and liabilities and rates of revaluation. As above, letting *i* represent the 16–24 age group, we can estimate asset accumulation for this age group as

$$asfrh_{i,t} = dasfrh_{i,t} + (1 + rasfr_t)(asfrh_{i,t-1} - w_{i,t-1}\, asfrh_{i,t-1})\left(h_{i,t-1} \big/ h_{i,t}\right)$$

For households in age groups 25–29 to 70–74, letting *i* represent the current age group, and *j* represent the proceeding age group (e.g., the age group pair 25–29 and 16–24), then

$$asfrh_{i,t} = dasfrh_{i,t} + (1 + rasfr_t)\left(asfrh_{i,t-1} - w_{i,t-1}\, asfrh_{i,t-1} + w_{j,t-1}\, asfrh_{j,t-1}\left(h_{j,t-1} \big/ h_{i,t-1}\right)\right)\left(h_{i,t-1} \big/ h_{i,t}\right)$$

Finally, for the age group 75 and above,

$$asfrh_{i,t} = dasfrh_{i,t} + (1 + rasfr_t)\left(asfrh_{i,t-1} + w_{j,t-1}\, asfrh_{j,t-1}\left(h_{j,t-1} \big/ h_{i,t-1}\right)\right)\left(h_{i,t-1} \big/ h_{i,t}\right)$$

In other words, in history, we construct the net flows from given stocks. Going forward, we project net flows, then use these to update stocks.

Based on the age distribution of assets and liabilities, we can calculate how cohorts accumulate net worth over their life cycle, and we can compare cohorts at the same age (see Exhibit 3.22). Similarly, based on distribution of net asset flows, we can calculate a balance-sheet view of life-cycle savings by cohort. We sometimes smooth these curves using the Hodrick-Prescott filter before transposing to the age domain to provide a clearer view of life-cycle behavior (see Exhibit 3.7).

• • •

We believe that this strategy addresses the challenges with the synthetic panel approach noted above: It does not impose a common life-cycle curve; it provides an empirical explanation for the distribution of different economic outcomes across the age distribution; and it models age, time, and cohort effects simultaneously. Furthermore, this approach enables us to easily compute cohort-specific life-cycle curves for any variable in Exhibit B.1 that we estimate at the age group level (see, for example, Exhibit 2.14).

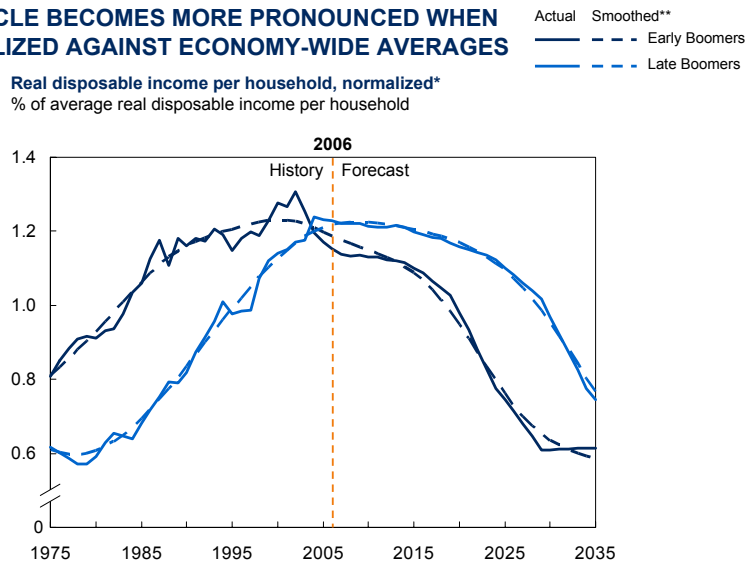
And, as we shall now demonstrate, it also enables us to decompose the impact of the economy from cohort-specific effects.

Decomposing the impact of cohorts from the economy

Because our direct cohort mapping approach is executed in the time domain, it enables us to make some straightforward comparisons that demonstrate how individual cohorts are performing relative to the economy. Dividing the average income per household of a specific cohort by the average income of all households in the economy at each point in time provides a relative measure of cohort performance. Viewed from this perspective, the cohort life cycle is even more pronounced (Exhibit B.3). If this ratio is above one, then the cohort is doing better than the average of all households in the economy at that time, and vice versa. These normalized curves can also be mapped to the age domain, so we can compare normalized income across cohorts (Exhibit B.4). We can see that all cohorts exhibited a pronounced life cycle measured relative to the times in which they lived.

Exhibit B.3

LIFE CYCLE BECOMES MORE PRONOUNCED WHEN NORMALIZED AGAINST ECONOMY-WIDE AVERAGES

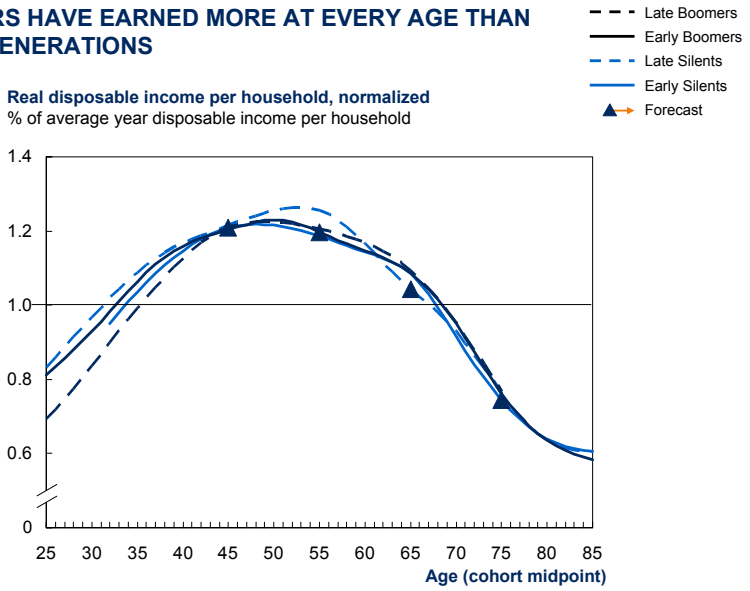


* Data for life-cycle curves displayed for cohort midpoint ages 25 and higher.
** Smoothed with Hodrick-Prescott filter.
Source: McKinsey Global Institute US Consumer Model, v7.2

Because the ratios in Exhibit B.4 have each cohort in the numerator and the denominator, we have to go one step further to understand how much of the cohort-specific life cycle is being driven by the economy and how much is cohort-specific. That is, we want to decompose this ratio into its constituent parts (see

Exhibit B.4

BOOMERS HAVE EARNED MORE AT EVERY AGE THAN PRIOR GENERATIONS



Note: Smoothed with Hodrick-Prescott filter.
Source: McKinsey Global Institute US Consumer Model, v7.2

Exhibit 2.4). Normalized average household income for cohort *i* at time *t* may be expressed as

$$\log(rydr_{t,i}) = \log\left(ydr_{t,i} / h_{t,i}\right) - \log\left(ydr_t / h_t\right)$$

where $ydr_{t,i}$ is the disposable income at time *t* for cohort *i*, $h_{t,i}$ is the number of cohort *i* households at time *t*, and variables with cohort subscript are economy-wide averages. Expressing the economy-wide average as geometric mean and assuming there are *C* cohorts, we have

$$\log(rydr_{t,i}) = \log\left(ydr_{t,i} / h_{t,i}\right) - \log\left[\left(ydr_{t,i} / h_{t,i}\right)^{\frac{h_{t,i}}{h_t}}\right] - \overline{ydrh_t}$$

$$\text{where} \quad \overline{ydrh_t} = \log\left[\prod_{j=2}^{C}\left(ydt_{i,j} / h_{t,j}\right)^{\frac{h_{tji}}{h_t}}\right]$$

Solving for the average income of cohort *i* and taking first differences,

$$d\log\left(ydr_{t,i} / h_{t,i}\right) = d\left(\frac{1}{1-\left(h_{t,i}/h_t\right)}\overline{ydrh_t}\right) + d\left(\frac{1}{1-\left(h_{t,i}/h_t\right)}\log(rydrh_t)\right)$$

Thus, we can express the growth rate in average income per household for cohort i as the sum of two components. The first term is the average growth rate of income per household for all other cohorts in the economy. The second term is the growth rate of cohort *i*'s income relative to the average of the economy as a whole. This second term is zero if the growth in income for cohort *i* is the same as the average for the economy. Thus, the first term reflects how cohort *i*'s income would grow if its income expanded at the same pace as everyone else's income, and the second term reflects how much better (or worse) that cohort *i* is doing relative to everyone else over time—it measures cohort-specific differences.

In Exhibit 2.4, this decomposition determines the split between "higher returns to education and work" and the "economy effect." These higher returns are the most important differentiating cohort-specific factors for the Boomers.

The Theil decomposition

Using our estimates of the percentile income distribution, we can derive several different measures of income inequality. We can offer some insights into the demographic sources of the inequality using the Theil index.

The Theil index for an individual cohort may be calculated as follows:

$$T_c = \sum_{i=1}^{P} \frac{nhh_i}{nhh_c} \times \frac{ydrh_i}{ydrh_c} \times \frac{\log(ydrh_i)}{\log(ydrh_c)}$$

where nhh represents the number of households, in total, and for each percentile; $ydrh$ represents the real disposable income per household, overall and for each percentile.

The Theil index, unlike the more popular Gini coefficient, has the desirable features of being additive and decomposable. Thus, we can calculate the overall index of inequality as the sum of Theil indices for each cohort. The formula for aggregating the individual cohort Theil indices is as follows:

$$T = \sum_{c=1}^{N} \frac{nhh_c}{nhh} \times \frac{ydrh_c}{ydrh} \times \frac{\log(ydrh_c)}{\log(ydrh)} + \sum_{c=1}^{N} \frac{nhh_c}{nhh} \times \frac{ydrh_c}{ydrh} \times T_c$$

This allows us to isolate the impact of any individual cohort on overall inequality by tracking changes in the number of households in the cohort, their average income, and the change in the cohort's income inequality. The change in the Theil index can be decomposed into the impact from changes in income inequality

among cohorts, and changes in income inequality *within* a cohort. Furthermore, it is possible to decompose changes in inequality into the impact of changes in the relative number of households, changes in relative incomes, and changes in the cohort-specific Theil index.

When we do this, we find that the first two factors are almost entirely due to demographic and life-cycle factors. The first is based on household formation, driven by the number of individuals in the cohort. The second is due to the position of the cohort in its life cycle. That is, when members of a given cohort are early in their careers, that cohort is well below the average income in the economy as a whole. As they age, their incomes rise above the average for the overall economy. As discussed in Chapter 2, the combination of the demographic and life-cycle factors were particularly pronounced for the Boomer cohort.

The final driver of change is the impact of rising inequality within a cohort, which can be attributed to the well-observed rise in inequality as cohorts age and to broader trends in inequality over time. As discussed in Chapter 2, the secular rise in inequality in recent years has been attributed to a variety of sources such as greater returns to education, technological change, increased prevalence of pay for performance, and globalization. As a result, within their cohort, Boomers have become more unequal, earlier in their lives, than prior cohorts.

PERCENTILE DISTRIBUTIONS AND THE FIXED-BRACKET TRANSFORMATION

Estimation of equations to forecast the percentile distribution proceeds exactly along the lines described for the age groups, so we will not repeat the description here. More interesting is how we can use the percentile forecasts, which themselves have a significant limitation: Income cutoff points between percentiles change over time, causing a shift in the profile of households within each percentile. More meaningful comparisons across the income distribution can be made when we transform the data into fixed brackets based on constant inflation-adjusted income cutoff points. To do this, we estimate the income distribution using a model based on the Dagum distribution. We then employ a methodology we developed called "synthetic equations" to estimate category spending, net worth, and key demographic concepts across the fixed-bracket distribution of income.

Dagum distribution

The Dagum function is a closed-form, invertible, cumulative-distribution function. It has been found to provide accurate estimates of income distribution in more

than 60 countries.[25] We estimate a three-parameter version of this distribution function[26]:

$$F(x) = \frac{1}{\left(1 + \lambda x^{-\delta}\right)^{\beta}}$$

in which x is the share of total disposable income within an age group: ß and δ are shape parameters that reduce inequality as they increase; and λ is a scale parameter.[27] The Dagum function provides estimates of quantile cutoffs given any disposable income share. The inverted Dagum function provides estimates of income shares based on quantile cutoff information. Thus, we can use the Dagum function to estimate our fixed-bracket income distribution.

We estimate the parameters of the (inverted) Dagum function using nonlinear least squares. To increase the sample of information and provide stability for our estimates of the income distribution in any year, we pooled observations for the current year with those of the prior and following years. In addition, because of limited information in the upper tail, we imposed a constraint during the estimation procedure that ensured that the upper tail of our estimate was well-behaved and that the distribution remained bounded.

Once we have estimates of the distribution parameters, we can derive the average real disposable income for any part of the distribution. To do this, we calculate estimates of income shares using a very fine grid. Each cell in the grid represents 0.01 percent of households, and the value in each cell is the share of income for that set of households. For example, if we define a cutoff of $60,000 per household, we can "walk up" the grid, accumulating the income shares from each cell in the grid. Once we reach the cutoff, we could then determine the number of households and the average disposable income characterizing households in that income bracket. That defines the income distribution within an age group.

25 F. Campano and D. Salvatore, Income Distribution, Oxford University Press, 2006, p. 51. Dagum derived the function based on several observed properties of income distributions. Income distributions are consistently skewed rightwards and unimodal; distributions have a small number of households with null or negative income; and the income elasticity of the cumulative distribution function falls monotonically as incomes increase.

26 C. Dagum, "A New Model of Personal Income Distribution: Specification and Estimation," *Economie Applique*, 1977, vol. 30, pp. 413–37.

27 This scale parameter is the exponential of the constant of integration and allows comparison of distributions expressed in different monetary units. See Dagum, *ibid*; H. Gertel et al, "Unemployment and Income Distribution Analysis," paper presented at the AAEP Annual Conference, 2001.

The synthetic-equation approach

To provide estimates of category consumption by fixed-bracket income class, we leverage the equations estimated using percentile-based information. This "synthetic equation" approach was possible because we had specified our category distribution equations in relative terms. For example, within an age group, we estimate an equation that predicts average consumption per household by percentile, relative to average consumption per household for age group, using average income per household, average net worth, and average household size by percentile, relative to their age group per household averages. Structuring the equations in this way, we can substitute relative fixed-bracket values for relative percentile values and the equations remain valid. This approach works, providing that all parameter estimates in the pooled cross-section time series specifications have common coefficients across income classes and that there are no fixed effects.

Once we have restructured the synthetic equations using fixed-bracket income classes, we can predict average household spending and average household net worth across the income distribution within age groups.

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