Mutual Fund Innovation: Past and Future

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"The only thing that stays the same…is change"

- Heraclitus/Melissa Etheridge

I. Introduction

Whether in technology, marketing, or the mutual fund industry, innovation is a continual process of change. As the demands of investors change, as regulations are passed, as new technology becomes available and as new intellectual discoveries are made, mutual fund families face new profit opportunities and the marketplace changes. By definition then, innovation is both certain and yet at the same time unpredictable. It is easy, in fact it is trite, to predict that innovation will occur – for nothing stays the same - and yet it is very difficult to predict the exact form innovation is likely to take. [1] Yet this is the goal of this paper, to predict the future of the mutual fund industry.

Lest I give up before I've even begun, it helps to put some structure on this exercise in prognostication. When predicting the future, it helps to look to the past. Studying prior innovations increases understanding of the current economic forces and motivations which influence mutual fund families, financial advisors and investors. This knowledge, combined with basic economic analysis is the key to predicting how these players will change and react to change in the future. Finally, it helps to have a predictable, exogenous event that will quite certainly affect the industry. Fortunately, we are in the middle of just such an event right now in 2007, the unstoppable progression toward retirement of the baby-boom generation.

The baby-boom has been affecting the U.S. economy since it began in 1946. Newsweek magazine reported on the recent increase in birthrates in 1948 under the title

[1] Like the proverbial $20 bill on the sidewalk, the obviously profitable innovations have already been undertaken.

"Population: Babies Mean Business." [2] The article goes on to chronicle increases in demand for infant clothing, prepared baby food and childrens books, and new firms starting up in the children's recording and children's book industries. Moreover, "business analysts predicted that eventually the boom in babies would have salutary effects on every corner of the nation's economy." The mutual fund industry has been no exception. Mutual funds have, almost literally, grown up with the baby-boom generation and the shift of these 80 million people from worker/savers to retirees/consumers will surely influence the evolution of the industry going forward. This paper presents an analysis of some of the likely features of these future changes.

[2] "Population: Babies Mean Business", Newsweek, 8/9/1948.

II. Financial Innovation in the Mutual Fund Industry

In thinking about how the US mutual fund industry is likely to evolve in the future, it is instructive to take a brief look at innovations in this industry in the recent past. A comprehensive look at the process and drivers of financial innovation, even within the mutual fund world, is beyond the scope of this paper but Tufano (2002) and Frame and White(2004) provide modern surveys of the academic literature regarding financial innovation more broadly. As those papers note, innovation can involve the introduction of new financial products or services, new or enhanced processes for developing or distributing these products and services, and the introduction of new organizational forms. Behind-the-scenes innovation in processes such as record-keeping and quantitative modeling will for the most part not be addressed in this paper but are also surely occurring none-the-less. The following sections provide a 'helicopter tour' of innovations in products, services and industry organization in the mutual fund industry as well as a brief discussion of the driving forces behind these innovations.

A. Product Innovations

The 8,120 mutual funds in existence today, defined broadly as open-end commingled accounts, have already been the subject of much innovation and many are in fact quite different than the original fund, the Massachusetts Investors Trust (M.I.T.), introduced in 1924. Still in existence, more than 80 years later, M.I.T. is what we would today term an actively managed domestic equity growth and income fund. A major type of innovation in mutual funds has been to extend the product to include portfolios in

other asset classes, including all types of bonds (corporate, municipal, high yield), international equities and debt, and short-term money market instruments. Moreover, there is now a language to describe the 'style' of mutual fund portfolios. Mutual funds are commonly categorized by the capitalization (small, mid-cap, large) and the growth orientation (growth, value, blend) of their holdings. The 1980's saw the introduction of a variety of sector funds, allowing investors access to portfolios comprised of stocks in one particular industry such as energy, healthcare, technology, or dotcoms . This array of more narrowly defined mutual fund styles has expanded investor opportunities by allowing investors to custom-design their overall investment allocations while, within each segment, retaining the benefits of cost-efficient diversification and fund management.

Two more recent innovations in this vein include the introduction of socially responsible mutual funds and the very new 130/30 funds.[3] Socially responsible funds allow investors to structure their portfolios in accordance with their personal goals for both financial gain and social action. Entry into this market has largely been led by smaller advisory firms which specialize in socially responsible investing (e.g, Calvert, Domini) but several large advisory firms such as Fidelity, TIAA-CREF and AXA have also added a few socially responsible funds to their line-up. The 130/30, and other long/short funds, differ from traditional long-only equity funds in that they leverage their long investment by short-selling a fraction of the value of the portfolio, in this case 30%. This general strategy has been a common practice in hedge fund portfolios which, likely based on good performance, has diffused into the retail fund market.

[3] In March 2006, Morningstar introduced a new long-short category for funds which maintain a 20% short position over a multi-year time period.

Some mutual fund innovation has focused more on the investment process rather than the type of portfolio holdings. In 1976, John C. Bogle introduced the first passively managed index fund.[4] Following on academic research that suggested that a market index portfolio was not only optimal from a theoretical viewpoint but also that it was likely to earn higher returns than most actively managed mutual funds, index funds gave investors access to a diversified portfolio of stocks without the risk that their portfolio manager was inactuality quite unskilled at picking stocks. Since that time, the menu of index funds has grown to include passively managed funds in every style and asset class.

A similar concept to the automatic portfolio allocations of index funds lies behind the very new lifecycle (or target date) funds. Academic research provided validation for a policy of shifting portfolio weightings from equities to bonds as an investor ages.[5] Lifecycle automate this reallocation thus saving investors time and effort and thereby creating value. These funds have been very popular since their introduction in 1995, amassing $114 billion in assets under management in 2006, with roughly 90% of these assets held through retirement accounts.[6]

Finally, one of the largest and most successful innovations in mutual fund investing has been the introduction of a new type of investment company: exchange traded funds (ETF's).[7] ETFs are similar to index funds in the sense that they are passively managed to duplicate the return on an index. In this sense, ETF's are certainly substitutes for open-end index mutual funds for many investors but remain distinct due to their single distribution channel. Unlike mutual funds which can be purchased directly

[4] In 1971 Wells Fargo introduced an equally weighted S&P500 index funds, sold through private placement.
[5] See Bodie, Merton and Samuelson (1992).
[6] ICI Mutual Fund Factbook, 2007.
[7] For a thorough history of ETF's and their predecessors, see Gastineau (2002).

from a fund company or through an advisor or a broker, ETF's are sold exclusively through brokers and trade on an exchange like shares of stock. Since their introduction in 1993, the evolution of ETF's has mimicked that of mutual funds in general. In 2006 alone 67 new industry or sector ETF's were launched and total net assets in ETF's reached $422 billion, spread across both equity and fixed income and domestic and international asset classes. The growth in ETF's has been driven by both individual and institutional investors.

Figure 1 shows the growth in the number and assets of the more recent mutual fund innovations: lifecycle funds, ETF's, lifestyle funds and fund-of-funds.[8] Lifestyle funds maintain a particular risk level over time (e.g., aggressive or conservative). Fund-of-funds are mutual funds comprised of shares in other mutual funds and include both lifecycle and lifestyle funds along with funds pursuing a multi-manager style.

B. Advice and Services

Perhaps the biggest innovation in mutual funds is that they have progressed from predominately investment vehicles to include various bundles of investor services including information, investment advice, planning, recordkeeping, and access to and trading of other investment products. In 2005, the ICI Mutual Fund Factbook reports that the investor servicing function accounts for a larger percentage of jobs in registered invesetment companies than fund management (32% v. 31%). If we include sales and distribution employees as providers of investor services of some type, the percentage increases to 55% of employees. While there is no readily accessible data for earlier

[8] Data from ICI Mutual Fund Factbook, 2007.

periods, it seems reasonable to assume that the fraction of employees involved in fund management was much greater in past decades.

Within the last decade this list has grown to include internet access to enhanced versions of all these services plus real time account management. A particularly powerful way to see this facet of service evolution is to compare the web site of a major mutual fund advisory firm in 1997 and today.[9] While a comparison of Figures 2a and 2b illustrates advances in web design over the past decade, the tremendous growth in online tools, research and advice is also apparent. Moreover, fund families are actively advertising their advice in addition to their fund return performance – a recent web ad for Vanguard asks investors if they "Need help choosing?", while showing a scrolling array of neckties in a myriad of patterns and colors. The analogy to selecting investment products is clear and the main service being promoted is Vanguard's ability to help investors make good decisions.

Improvements in investment information and advice have also come from firms outside the investment management industry. Examples are information intermediaries such as Lipper and Morningstar, founded in 1973 and 1984 respectively, and financial media publishers such as Smartmoney, founded in 1997. Today these firms and others provide everything from basic fund information to sophisticated analytics and planning tools to both individual and institutional investors and financial advisors. Mutual fund investors value objective and easy-to-interpret information on fund performance and comparisons, such as the Morningstar star-rating system, because they significantly reduce decision costs both in terms of time and effort. The continued survival of these

[9] These webpage views were accessed using "The Wayback Machine" at www.archive.org.

firms is a testament to the value the investors place on these services and information.[10] These firms have also continued to innovate: Morningstar revised its star-rating algorithm to include style categories in 2002 and introduced fund governance/stewardship ratings following the mutual fund market-timing scandal in 2003.

C. Industry Structure

The organization and structure of the mutual fund industry has changed over time as well. Prior to 1980, mutual funds were either sold through brokers, who were compensated via a front-end load, or sold directly to investors with no load fee. In 1980 the SEC approved rule 12b-1 which allowed funds to spread distribution and marketing fees out over time. Mutual funds implemented this rule via the introduction of new shares classes within one mutual fund, each share class with its own fee structure. The ability to offer these multiple share classes allowed fund advisors to distribute shares through different channels: captive brokers, wholesalers and financial advisors, institutional 401(k) programs, and directly to investors. The use of share classes has been quite popular, in 2006 there were 8,120 unique mutual funds offered through 21,260 share classes, an average of 2.6 share classes per fund.

Investors participate in these channels according to their preferences for advice, service, and the availability of employer-based investment opportunities. The proliferation of share classes and the consequent spread in distribution has made it more and more difficult to pigeonhole a mutual fund firm into any one distribution channel, resulting in a characterization of today's market as suffering from 'channel blur'.[11] Thus

[10] Confirming this 'market test', Del Guercio and Tkac (2007) document that changes in Morningstar ratings have a significant, and in some cases quite large, effect on the flow of investment into specific funds.
[11] Data on distribution channel from FRC indicate that the % of mutual fund advisors with >75% of their assets distributed through one channel has fallen from 91% to 74% between 1996 and 2002.

12b-1 fees have allowed mutual fund advisors a convenient way to reach different types of investors. While I believe that this change has been beneficial it is worth noting that the process of expanding access across distribution channels would likely have occurred without 12b-1 fees, albeit in different ways.

Another way in which mutual fund advisors have broadened their investor bases is through the increasing use of subadvisory contracts.[12] Subadvisory contracts are essentially outsourcing arrangements between mutual fund advisors and other portfolio management firms (institutional asset managers and other mutual fund advisors). Effectively this allows the subadvisor to profit from managing a portfolio which is ultimately distributed through a channel that the subadvisor would find it unprofitable to serve on their own. Over the past 10 years the trend has been toward greater use of subadvisory contracts (7% of funds in 1996, 12% in 2002, 17% in 2006) and the increasing frequency of mutual fund advisors serving as subadvisors. Thirty-four percent of subadvisory contracts in 1996 involved mutual fund subadvisors, this fraction grew to 52% in 2002. A closer analysis reveals that mutual fund firms serve as subadvisors almost exclusively for funds distributed through a channel that is different from their own (e.g., a direct-sold mutual fund firm will subadvise for a captive-broker sold mutual fund advisor). Subadvisory contracts have also been used to facilitate entry into the mutual fund market by other financial services providers such as ING and insurance companies like Pacific Life. These firms employ a 'virtual family' strategy in which they employed subadvisors for all of their funds, lowering the cost and development time of bringing the mutual fund offerings to their investors.

[12] The following is based on Del Guercio, Reuter and Tkac (2007) which includes an analysis of the economics of subadvisory contracts and statistics on this practice.

A related development in the past 15 years has been the shift from proprietary fund-distribution to the open-architecture of fund supermarkets. In 1992, Schwab OneSource was the first retail mutual fund supermarket, providing Schwab investors access to a variety of funds run by other fund advisors. Since that time, several brokers and large fund families offer supermarkets to their investors, including ETrade, TD Ameritrade, Vanguard, Fidelity and T. Rowe Price, in addition to Schwab. As of 2004, an estimated $600billion in mutual fund assets was held through supermarket arrangements.[13] Similar to the motivations to participate in the subadvisory market, supermarkets allow families such as Dodge&Cox to access Fidelity's distribution channel and provides investors with a wider scope of products.

Along with subadvising and the enhancement of investor services, the existence of cross-selling via supermarkets suggests the primacy of 'client accounts' in the economic calculus of mutual fund advisory firms. It does not seem a stretch to characterize mutual fund families as having morphed from small shops specializing in the stock picking ability of their managers to large scale, financial services firms which provide a range of products and services to meet the multidimensional demands of its customers.[14] Surely, portfolio management is still the 'core product' but it is now packaged with services to increase investor confidence, peace of mind and satisfaction with respect to risk, planning and safety.

D. Drivers of Innovation

Mutual funds are in many senses no different than many other goods and services produced and consumed in the U.S. economy. In all industries, firms seek to maximize

[13] "Supermarket Sweepstakes" Forbes 9/20/2004.
[14] To be sure there are many smaller 'boutique' fund shops remaining but the majority of industry assets and flows accrue to the larger, multi-dimensional fund families.

profits which, in turn, motivates them to decrease the costs of production or distribution, increase the value of output to consumers and create new valuable products and services to sell to new groups of consumers. And this motivation spurs innovation – changes in production processes, development of new products, marketing new uses for existing products, etc.

At the heart of every innovation is a new profitable, creative idea. In some sense it is difficult, if not impossible, to speak of the cause of innovation since there is no observable font from which these new ideas spring, fully formed. Furthermore, as Tufano (2002) notes, it is likely incorrect to attribute any particular innovation to one cause alone. However, we can look at past innovation and characterize some of the forces that seem to have driven them.

In some cases, innovations occurred largely without any change in the external market environment. For example, academic research on fund management and performance provided a strong base conceptual base for the application to index funds and lifecycle funds and likely for the advent of style-based investing (i.e. drawing on return anomalies documented in the academic literature). Innovations in industry structure like subadvising and fund supermarkets typically diffuse throughout the industry without a particular impetus – one firm identifies a profitable new strategy and others mimic as they assess their own profit opportunities. Other innovations are strongly influenced by discrete changes in non-market factors such as regulation or tax policy. Examples of these are the introduction of share classes as described above, or advice regarding the tax efficiency of various funds and other investment products.

Many innovations occur in response to, or are aided by, changes in the market environment in which mutual fund families operate. For example, there is no doubt that the advances in technology have contributed substantially to almost all of the product and service innovations described earlier by decreasing the cost of computations, memory and making dissemination of information and account services possible over the internet. The remainder of this paper looks into the future, toward a fundamental change in the preferences and decisions facing the investor base of mutual fund families and the industry innovations that are likely to follow.

III. Looking to the Future – Demographic Changes

While it is often impossible to predict where and how innovation will occur, sometimes there are predictable changes in the underlying economic environment that are significant enough to provide guidance when peering through the looking glass to glimpse the potential future of the mutual fund industry. Such is the case in 2007, a fundamental change in investor demographics is on the horizon, predictable enough that it has already motivated innovation in mutual funds and is likely to spur even more: the movement of the baby boom into retirement.

The 'baby boom' is typically defined as the roughly 80 million people born in the United States between 1948 and 1964. During this period the fertility rate increased from 2.3 children per woman in 1940 to 3.3 children per woman at the peak of the boom in 1957.[15] Since that time, the fertility has dropped back down to a roughly stable 2.05. The resulting effect on the age distribution of the U.S. population in 1985 is illustrated in

[15] See Simon and Tamura (2007).

Figure 3, where the baby boom is seen as the bulge between ages 20 and 40. This 'bulge' in the population distribution moves predictably, inexorably, to the right as time passes and can still be identified in 2006. Using projections from the U.S. Census Bureau, based on current trends in fertility, mortality and immigration, Figure 3c is a snapshot of what the population distribution is likely to look like in 2025. The baby boom is still reflected in the relatively higher proportions of people between 60 and 80 years old. However, the 'bulge' is not as apparent – the population distribution is projected to be much flatter than it was 20 years ago. This is the result of two main effects, the positive relation between mortality rate and age (i.e. natural attrition at the top end of the distribution), and higher levels of immigration of individuals at the younger end of the distribution than existed in the earlier periods.

While the retirement of the baby boom is of central focus, the growth of the younger portion of the population is important as well. Figure 4 illustrates the number of people in the age ranges 25-40, 40-65 and 65 and up, over the period 1980 to 2025, using projections for future dates. These age groups correspond roughly to 3 different investor clienteles: young workers, traditional savers and retirees. According to a Fidelity Investments survey, traditional savers have an average personal savings rate of 4.3% and are in their prime wealth accumulation years, saving for both college and retirement.[16] Young workers, in contrast, have a personal savings rate of only 2.9% despite a median pre-tax income that is only $5000 than that of traditional savers. While the retiree group is the projected to be the fastest growing over the next 20 years, the largest number of potential investors will be traditional savers (i.e. those who are young workers now). This represents a significant market opportunity for mutual fund families as well..

[16] "GenXers lag in Retirement Savings", InvestmentNews 3/26/07.

As baby boomers face the prospect of retirement, there are several trends that already have and will continue to impact their financial opportunities and decisions:

1- Shift from defined benefit to defined contribution employer-sponsored retirement plans. Over the past 20 years, the percentage of private sector workers participating in defined benefit plans has dropped from 80% to 33% while the percentage of employees with defined contribution plans has increased from 41% to 51%.[17] In terms of assets, currently $4.1 trillion of retirement savings is held in defined contribution plans compared to $2.3 trillion in defined benefit plans.[18] This change means that workers are now, and will be in the future, much more responsible for managing their own financial plans for retirement than prior generations. The stable source of retirement income offered by defined benefit plans has been replaced by a system in which workers guide both the accumulation and decumulation of savings. The majority of defined contribution assets are held in mutual funds and the shift of risk from employers to workers in the accumulation years has spurred much of the demand for and subsequent growth of investment advice discussed in section II.

2- Increasing life expectancy. For a baby boomer born in 1960, life expectancy was, at that time, 69.7 years. For a person turning 65 in 1960, life expectancy was 14.3 years. Both of these statistics have increased in the past 45 years – a child born in 2004 has a life expectancy of 77.8 years and a 65-year old retiree can expect to live another 18.7 years.[19] As the baby boomers have aged, their projected lifetimes have increased.

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[17] Statistics for 1985 and 2003, respectively, for workers who participate in a retirement plan. From the Employee Benefits Research Institute Factbook, 2007 at http://www.ebri.org/publications/books/index.cfm?fa=databook.

[18] ICI Mutual Fund Factbook 2007.

[19] All of these statistics are from the Center for Disease Control, National Center for Health Statistics: www.nchs.org.

Assuming a constant retirement age of 65, and combined with the trend toward defined contribution retirement plans, this implies that over time investors are facing the prospect of funding longer retirements than their parents or grandparents.

3- Social Security insolvency. According to the 2007 Social Security Trust Fund Report, social security tax revenues will be insufficient to fund outlays beginning in 2017.[20] By 2041, only 75% of projected benefits will be able to be funded out of tax revenue. The Trustee's Report estimates that an immediate increase in payroll taxes of 16% or a 13% reduction in benefits would bring the program into actuarial balance. Following the Bush administration's failed attempt to reform social security and introduce private accounts in 2005, and the upcoming elections in 2008, immediate action addressing the social security funding shortfall are not likely to occur. The longer the underfunding remains unaddressed, the larger the ultimate changes in taxes or benefits will need to be. According to a 2007 AXA Equitable survey, 86% of workers surveyed believe that reform will include an increase in the age at which benefits are paid and 73% predict a reduction in benefits.[21] This implies that future retirees are exposed to both a decline in their expected benefits and also significant uncertainty regarding the actual level of the Social Security benefits, if any, that they are likely to receive.

4- Health care costs/Medicare crisis.[22] The funding situation is similar, but more dire, when it comes to Medicare. Medicare costs are expected to surpass Social Security expenditures in 2028 due to a continuing high rate of increase in health care costs. By 2019, the Medicare Hospital Insurance Trust Fund will be able to fund only 79 percent of expenditures from tax receipts. Not surprisingly, the estimated increases in

[20] See http://www.treas.gov/offices/economic-policy/reports/social-security-report-2007.pdf
[21] AXA Equitable Retirement Scope, January 2007.
[22] See http://www.treas.gov/offices/economic-policy/reports/medicare-report-2007.pdf

payroll taxes or reduction in benefits needed to maintain solvency are much greater than for Social Security. [23] The uncertainty regarding changes in Medicare going forward have an especially large impact on prospective retirees, since they will be large consumers of health care.

IV. What's so Different about Decumulation?

Saving for retirement during an investor's working years is primarily wealth accumulation – the focus of advice and financial planning is on accumulating enough wealth, through savings and investment decisions, to finance consumption throughout retirement. In other words, investors want to maximize the value of their savings at age 65 for a given level of risk that they are willing to take on. As workers retire, however, their objective turns into achieving some optimal plan for asset decumulation – the spending down of their accumulated wealth. With the retirement of the baby-boom looming, demand will predictably increase for advice and products that help investors understand, plan and achieve their preferred decumulation strategy. This section discusses the conceptual differences in optimal asset accumulation and decumulation and highlights why innovation will be necessary to meet investors' changing demands.

A. Optimal Asset Accumulation

Theories of optimal asset accumulation are also known as optimal portfolio choice theories and date to Markowitz (1959). Investors are assumed to like average return and to dislike risk. The efficient frontier and optimal portfolio allocation model illustrates that, when a risky asset is available, all investors would optimally choose a

[23] Estimates in the 2007 Report of the Trustees are an immediate 122% increase in taxes or 51% decrease in benefits.

portfolio of the riskless asset and one particular portfolio of risky assets (the tangency portfolio). These ideas are the basis for much of modern investment advice – diversify your portfolio and structure your investments according to your risk aversion. Putting this individual optimization problem into a market context led to the Capital Asset Pricing model and the equilibrium result that the tangency portfolio must be the value-weighted market portfolio of risky assets.[24] This CAPM itself suggests another piece of advice commonly given by Chicago economists and John Bogle, invest in a passive index fund.

Around these basic foundations, a voluminous academic and practitioner literature has evolved related to evaluating mutual fund performance and strategies for 'beating the market'. These include statistical tools like alpha, beta, style attribution and measures of market timing; and they include empirical 'regularities' regarding the performance of small-cap versus large-cap stocks, low versus high book-to-market stocks, the role of return momentum, etc. What all of this strategy and advice has in common, however, is its objective – to improve average investment returns without increasing risk. In essence, investors need to know only their own willingness to trade off risk for reward (more precisely, their risk aversion) in order to structure their investments, at least to a first order approximation. The role of more advanced aspects of optimal portfolio choice (e.g., additional risk factors such as inflation or macro-economic risk) or the advantage of tax-efficient portfolio management are in some sense second order and certainly much less attention is focused on these topics by information intermediaries and retail investors as a whole.

[24] Sharpe(1964) and Lintner (1965).

There is one other major decision to be made in the wealth accumulation phase – the amount to invest. This is effectively a savings versus consumption decision that is standard in much of economics and similar to smaller decisions faced by individuals everyday when they save for short term goals like a new car or a down-payment on a house. Separated from the specifics of how the investment will be managed, an individual needs to assess their own willingness to give up current consumption in order to save money to finance consumption in the future, in this case, after retirement. Formally, we model this decision as being a function of an individual's personal discount rate on future consumption (i.e. the rate at which he prefers current to future consumption), the horizon over which the consumption tradeoff will occur and the distribution of the uncertain return on the investment. In the particular context of saving for retirement, the horizon is often very long (40 years for a 25 year old), the costs of savings in terms of foregone current consumption are immediately obvious and, throughout much of their traditional savings years, individuals have the ability to increase savings if the returns on their investments do not meet expectations.

As the retirement date approaches, this ability to increase savings rates becomes less powerful and research has found that one strategy for dealing with this fact is to decrease the risk exposure of your investments as a person ages. Essentially, the approach of a retirement date has the same effect on an investor's portfolio as an increase in risk aversion; the solution is to reduce exposure to equities and high risk investments, and shift assets into bonds and other low volatility or guaranteed assets.

B. The Optimal Decumulation Problem

The decision facing an individual on the brink of retirement is, in some sense,

the exact opposite of the accumulation decision. In the accumulation phase the investor works toward amassing a pool of assets and in the decumulation phase he must decide how to spread out the spending, or disbursement, of these assets. There are not very many analogs to this type of decision in other areas of an individual's life. In some ways this decision is similar to setting a budget for clothing for the month and then deciding how to allocate this lump sum. In decisions like this one, the impact of any uncertainty (the risk of finding the perfect outfit later in the month, once you've run out of money) is quite small; the next month will bring a new budget and new opportunities. Uncertainty and risk play a much larger role in the decision regarding decumulation strategies. Fundamentally this is because retirees have limited opportunities to add to their assets if a costly negative shock should occur. One option is to extend your working years or return to work and indeed we see a trend in this direction. According to the Employee Benefits Research Institute, 48.9% of individuals in the 65-69 year-old age group were working full time in 2005 compared to only 36.4% in 1987.

A decumulation strategy commonly suggested by practitioners and advisors is to maintain a portfolio of invested assets and systematically withdraw a fraction of it each year . The time over which any withdrawal rate will provide income is a function of the uncertain future returns on the invested portfolio, which is itself a function of the allocation of assets to various asset classes (e.g., equities and bonds), and the rates of inflation that prevails in the future. Therefore, with a systematic withdrawal strategy retirees face a significant degree of longevity risk, the risk that they will outlive their pool of retirement assets. One oft-recommended example is the "4% Rule" in which 4% of the portfolio is withdrawn the first year, and the dollar amount is then increased each year to

keep pace with inflation. Under an assumption of a 10% average return on large-cap stocks, 6.5% on domestic bonds and 4.75% on short-term 'cash', and a 3% inflation rate, this 4% rule has a 90% probability of providing 30 years of retirement income when the underlying portfolio is weighted 60%, 30%, 10% in stocks, bonds and cash.[25]

Notice that the systematic withdrawal strategy still exposes the retiree to risk – if the actual returns on the invested portfolio are lower, or inflation is higher, there will be a significant probability of not meeting the income goal of 4% per year plus an inflation adjustment for the full 30 years. While there is only a small chance (5% for women and 1.4% for men) that a retiree would live 5 more years, to 100, there is a much larger chance that the retiree will die prior to age 95 and leave positive assets.[26] If the retiree has no desire to leave a bequest, this outcome would result in 'underconsumption' in the sense that a higher withdrawal rate could have been sustained if the length of life had been known in advance.

The academic research literature has focused on a very different strategy for decumulation. For a person without a bequest motive facing an uncertain lifetime, Yaari (1965) showed that it is optimal for the person to fully annuitize their wealth. The simplest form of annuitization involves entering into a contract, with payment upfront, that entitles the bearer to regular payments for the remainder of his life. Upon the person's death, the issuer of the annuity has no further payment obligations.

Under full annuitization, this feature of a simple annuity implies that there will be no assets left to bequest to heirs. For many retirees this may be undesireable. Partial

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[25] See T. Rowe Price Retirement Income Calculator for a representative example of a Monte Carlo simulation with these assumptions. http://www3.troweprice.com/ric/RIC/

[26] Society of Actuaries, RP-2000 Mortality Tables. http://www.soa.org/research/files/pdf/rp00_mortalitytables.pdf

annuitization 'solves' this problem in the sense the non-annuitized wealth can be bequested and size of the desired bequest will be a key parameter in the decision on the fraction of wealth to annuitize. For this reason, partial annuitization may be particularly attractive to retirees with 'enough' assets to both generate an acceptable income and leave a bequest.

Full annuitization of assets insures a retiree against longevity risk – the income they receive from the annuity is guaranteed for their lifetime. However, there is another risk which annuitization actually exacerbates, liquidity risk. If all of a retiree's wealth is annuitized, there is no pool of assets to draw on when unexpected expenses arise. In contrast, a systematic withdrawal strategy preserves liquidity and allows flexibility in spending by varying the withdrawal rate.

In the years since Yaari's original article, the theoretical research on the extent to which annuitization is an optimal strategy has progressed to models which include variable payout annuities, annuities linked to stock market returns and inflation, dynamic strategies involving delayed annuitization and more complicated annuity contracts with death benefits.[27] A recent study, based on a rich model of dynamic annuitization using variable payout annuities, finds that systematic withdrawals are "distinctly suboptimal, such that they [retirees] would have to be given up to 40% more initial wealth, to leave them as well off as with variable payout annuities." [28] This general characterization of the optimality of some type of variable annuity strategy is supported by many other research studies and holds for retirees both with and without a bequest motive.

[27] For an example of a fully dynamic model with variable annuities see Horneff, Maurer, Mitchell, Stamos (2007) . For an example of real annuities and inflation hedging, see Brown, Mitchell and Poterba (1999).
[28] Horneff, Maurer, Mitchell, Stamos (2007).

When choosing the specifics of an optimal retirement income strategy, there are several characteristics of a retiree's preferences that should be evaluated: What is his willingness to trade of liquidity risk for longevity risk? What are the characteristics of her bequest motive – what is her willingness to tradeoff my own consumption in retirement for consumption of my heirs after I'm gone? What are his life expectancy and expected health care expenditures? To what extent will her family act as a safety net if her assets run out or if she requires additional income in a particular year? What is his level of risk aversion – how much uncertainty is he willing to tolerate in the value of his assets and future consumption? What is her willingness to go continue working or to go back to work to supplement her investment or annuity income?

V. Innovation Going Forward

Twenty years ago most workers participated in a defined benefit pension plan which, in addition to social security, would provide a base of guaranteed income with which to fund retirement. Today, on average, workers have very little expectation of this guaranteed income and must take on the task of managing their own retirement savings and financial planning. These developments have so far been met with innovation in the area of wealth accumulation: advice, products and industry structures to meet the needs of workers in the 'saving' years. This innovation will likely continue but focus on products and services geared toward young workers who will continue to be a large market as they age. As the first of the baby-boomers moves into retirement, innovations will likely also expand to address the demands of investors in the decumulation phase.

This section describes some of the innovation already seen in anticipation of the rise in demand for retirement-related products as well as suggesting some directions that future innovation may take.

As we have seen in the last section, the accumulation and decumulation decisions are quite different and this implies that mutual fund families will be motivated to change and expand the current menu products and services to meet these new demands. As with prior innovation in this market, we should expect to see activity from both mutual fund families as well as firms outside the industry. In this particular case, the insurance industry is the obvious competitor for the management of retirees' decumulation. Thus central question for mutual fund families is: will they maintain control of assets as current investor clients move from accumulation to decumulation?

Certainly the most direct path to maintaining control of assets while meeting investor needs for retirement income is for mutual fund families to innovate in the area of systematic withdrawal plans. Effectively, this strategy just layers a withdrawal policy on top of fund-of-funds mutual fund portfolio (either a constant lifestyle-type mix of stocks, bonds and cash or a changing lifecyle-type allocation). Typically the choice of withdrawal rate, the management of withdrawals and the choice of an underlying mutual fund portfolio were left to investors themselves. Just recently, however, Fidelity and Vanguard have announced plans to launch new fund offerings that package a systematic schedule of monthly fund distributions (withdrawals) along with a risk-based mutual fund portfolio investment.[29]

[29] "New Vanguard Funds Aim to Lure Retirees", WSJ 10/1/.07 and "Fidelity Debuts Retirement Products", InvestmentNews 10/3/07.

Given the academic research which advocates the use of partial annuitization, we might expect fund families to face stiff competition from insurance companies who provide annuity products. However, the market for individual annuities is quite small, currently investors are not following the academic advice on optimal decumulation. It seems reasonable then to assume that insurance companies will also be motivated to innovate in order to increase investor demand for these products. The form that this innovation will take depends of course on why investor demand is low right now – what is stopping investors from annuitization? Recent research suggests that the most likely answers are the fact that families can act as self-insurance programs which substitute for annuitization (i.e. spouses can pool their longevity risk) and the lack of liquidity offered by traditional annuity products.[30] Investor concern about lack of liquidity can be exacerbated by health status. Recent innovations in the annuity market include products for the 'impaired' market (i.e. those with chronic disease such as MS or cancer). Similarly, Lincoln National has launched a new variable annuity product this year with an enhancement to increase flexibility in timing income payments.

In a bid to reach baby boomers prior to retirement, when annuitization decisions are typically made, several insurers have begun marketing annuities to 401(k) plans.[31] While reported takeup has not been large (some 50-60 plan sponsors across 4 insurance providers), and challenges with regard to recordkeeping exist, there is reason to suspect that this trend, or some version of it, will continue. Complementing the push into the DC market from annuity producers is shift toward decumulation in firms supplying DC plan participants with financial advice. Financial Engines Inc. is currently in a 'research

[30] Jeffrey Brown, "Life Annuities and Uncertain Lifetimes", NBER Reporter 2004 and cited papers.
[31] J. Gottlieb, "Annuities FanFare Hitting a Sour Note," PIonline 6/25/07. Examples include Hartford, MetLife, Genworth and Prudential.

phase' while TIAA-CREF seeks to offer proprietary advice on decumulation to its participants.[32] Such advice can serve to educate investors on the benefits of annuitization and its place in a personalized decumulation plan. By decreasing decision and information gathering costs, and providing a sense of comfort through understanding, these efforts may increase the demand for annuities.

As mentioned in Section 2, large mutual fund families are really better characterized as financial services providers. So it is not surprising that some have moved outside their core portfolio management business to offer their clients annuity products as well. This, however, requires a fundamentally different business model and risk management techniques since annuities are primarily an insurance product where risk is managed by the insurer whereas in mutual fund management, the investment risk remains with the investor. Mutual fund families have confronted this issue through two industry structure innovations: the purchase or establishment of an insurance subsidiary, or joint ventures, similar to subadvisory relationships, with insurance companies that provide annuity management. Rather than using a supermarket structure, these annuities are often branded by the mutual fund family (e.g., Fidelity Growth and Guaranteed Income).

As discussed in the previous section, the financial decisions involved in the accumulation and decumulation decisions are different in many respects. In particular, the decumulation decision seems to be much more idiosyncratic, involving more individual factors involved such as family status and health issues. This implies that advice related to retirement income planning will likely need to be more individualized. We might imagine each retiree sitting down with a financial advisor to build a customized plan – but the costs of providing this 'face time' are high. Innovations in

[32] J. Gottlieb, "Advice Providers Go Into Withdrawal", PIonline 9/3/07.

advice are therefore likely to evolve based on their scalability. Some financial advisors will be able to profitably meet this demand through the use of the packaged mutual fund products mentioned earlier – with much of the planning and withdrawal management built in, the advisor can more efficiently choose and present clients with a suitable strategy by choosing from a small menu of choices.

Computer modeling and automated decision tools are another avenue toward the cost-efficient provision of individualized planning. Several large mutual fund families have already added retirement income calculators and tools to their websites. The T.Rowe Price Retirement Income Calculator, for example, uses Monte Carlo analysis to provide estimates of sustainable retirement income based on an investors risk aversion, retirement horizon, marital status, assets and income. But sophisticated analytics still require investors and retirees to devote time and effort to acquiring expertise and making decisions about value of such calculations and how to utilize them in implementing a retirement strategy. Therefore, a natural complement to a slew of 'calculators' is a thorough yet easily understandable program of basic retirement management advice – designed to both educate investors on how much they gain via good management of their assets as well as illustrating how to put a plan together.

Again, new entrants from outside the traditional mutual fund and financial advisor industries are likely to play a role in this type of advice. Following passage of the Pension Protection Act of 2006, employers can now offer advice to DC plan participants and this is expected to spur innovation in advice provision through the employer-sponsored channel by firms like Financial Engines Inc. One tool that firms like these and other independent advice providers can use to enhance scalability is the dissemination of video

lessons via the internet. Indeed there are already videos related to annuity investment by Ben Stein and Thomas Scott on YouTube.

This raises the issue of how to leverage changing internet technology to meet the specific demands of retirees. There is a significant literature on web design and its findings are beginning to be applied in the mutual fund industry. Fidelity Investments operates the Fidelity Center for Applied Technology which, among other projects, conducts research on designing web sites to facilitate use by senior citizens. Among the challenges are how to design websites for individuals with visual or physical limitations (e.g., arthritis), cognitive limitations and those unfamiliar with web navigation. Among their interesting findings are that senior citizens tend to engage in 'cautious clicking' in which they hover over a link for a while before clicking on it. One explanation might be that seniors are wary of 'where' the link might take them. Fidelity has proposed solutions including labels on links such as 'View Accounts' rather than just the generic 'Accounts' or pop-up descriptions on links to reassure users of their navigation. It seems safe to say that going forward we will see more individualized enhancements of web content and advice.

In Section 3, we saw that while baby-boomers represent large growth in the future population of retirees, the population of traditional savers (age 40-60) will remain even higher. Mutual fund families are likely to find continued innovation to serve this set of clients quite profitable. Following on the discussion in Section 2 on the importance of establishing client accounts, the first wave of innovation may actually be targeted at today's young workers (age 25-40). Establishing client relationships with these investors at an early age could translate into long term profitability for fund families. We have

already seen some innovation in this direction. Schwab and American Century have lowered minimum investments on certain fund products to appeal to these young workers. American Century's initiative is called "My Whatever Plan" and includes target date funds out to 2050. Typically fund minimums are in place to cover the fixed costs of fund administration and record-keeping. To maintain profitability with lower minimums, several families restrict account information to web-only access or charge smaller incremental fees over time.

Web use is quite high in this age group and social networking sites are quite popular. Again we are beginning to see innovations in investor education by third party firms being disseminated via YouTube and MySpace. For example, FeelSmartAbout is a financial education startup that uses animated videos on these sites to prompt interest in its other products including a service to provide video lessons via email. It is still unclear whether these young workers will turn to independent financial advisors for help, feel satisfied with their ability to plan using web tools and advice from fund companies, or do most of their planning and investing through employer-sponsored programs. Over time we should expect to see experimentation by all of these groups in servicing young workers where they feel most comfortable, online and with their friends.

VI. Conclusion

It bears repeating, "The only thing that stays the same… is change". The mutual fund industry is no exception. Over the past 40 years the investing public has been the

recipient of a vast array of innovations in this industry that have significantly increased wealth and welfare. The future promises more of the same as mutual fund families, financial advisors, information intermediaries, insurance companies, and new firms we cannot even name yet, compete to satisfy the changing demands of U.S. investors.

The predictable shift of 80 million baby-boomers from work to retirement provides some direction in forecasting what changes are in store for the industry. The significant differences in the decisions and expertise involved in asset accumulation versus decumulation will spur innovation in mutual fund products, services, advice and industry structure to meet these new needs. In addition, continuing progress in the development of technology and the internet will ensure that innovation continues in the provision of traditional mutual fund portfolio management.

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Figure 1a. Total Net Assets In 4 Innovative Products
1989-2006

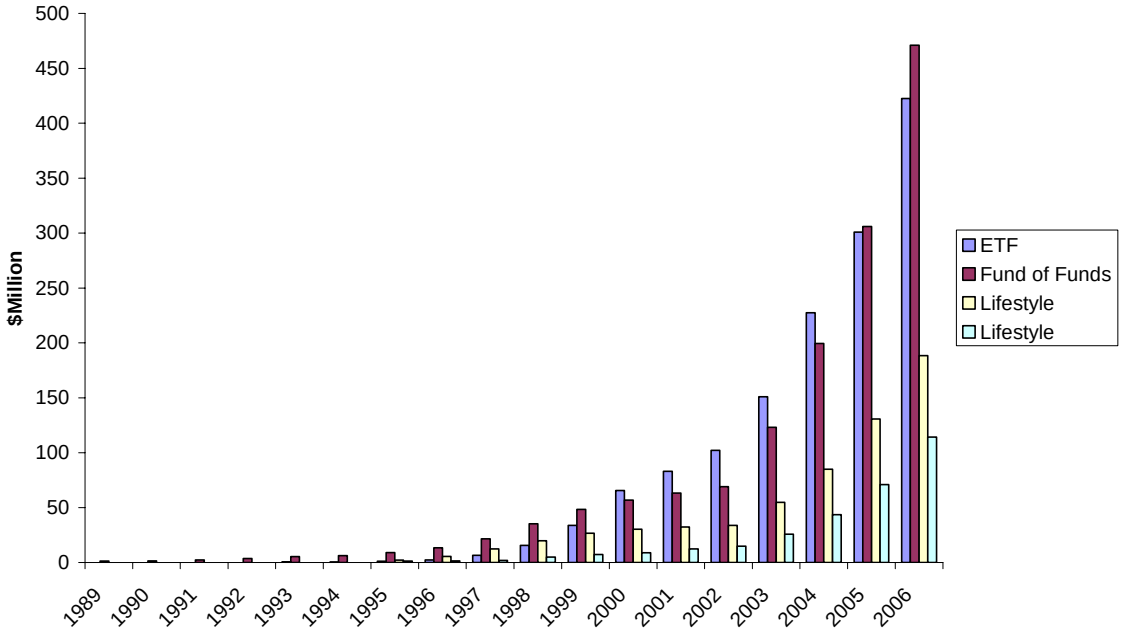

Figure 1b. Number of Funds In 4 Innovative Products
1989-2006

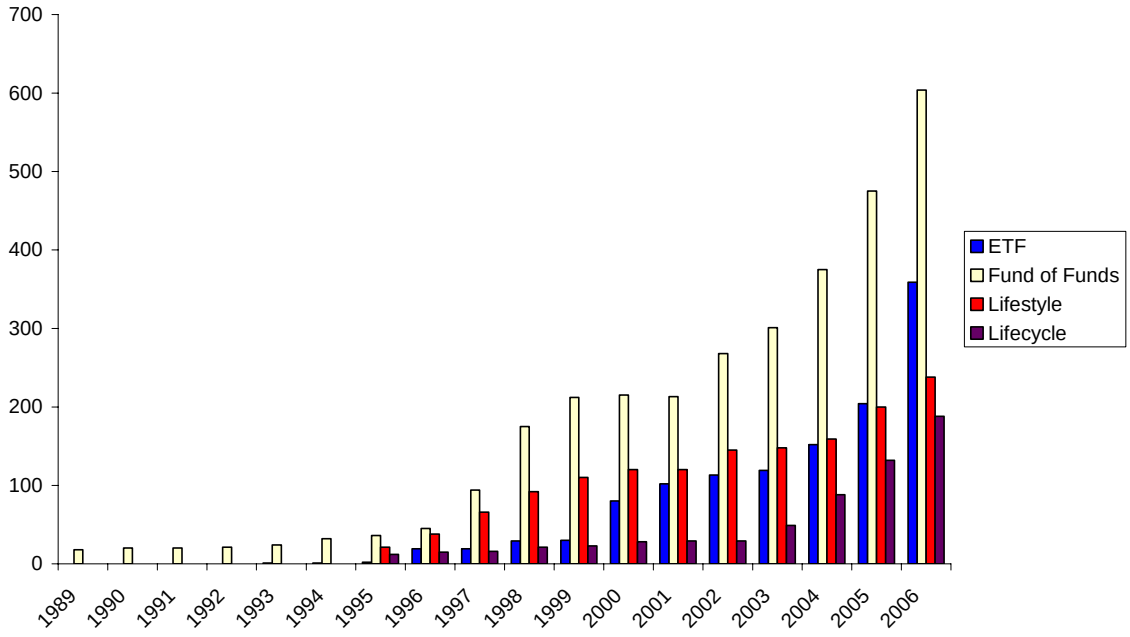

Figure 2a. Fidelity Investments Site Map 1997

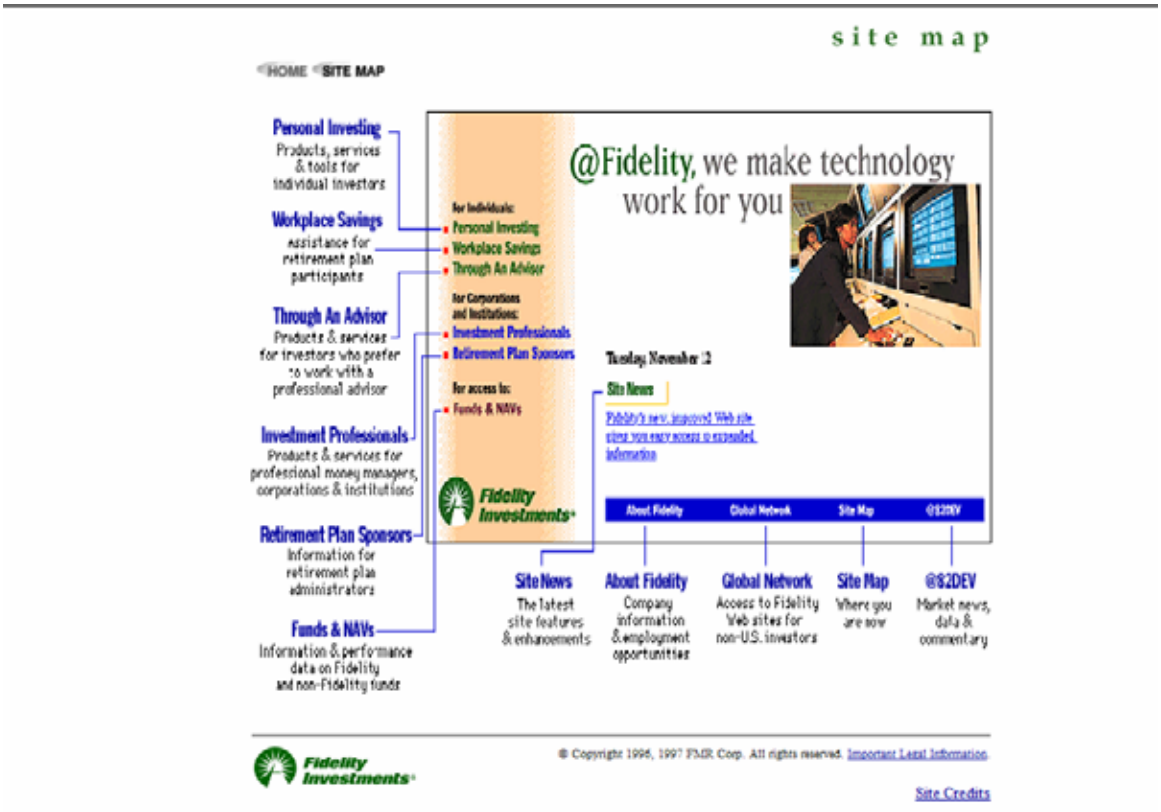

Figure 2b. Fidelity Investments Site Map 2007

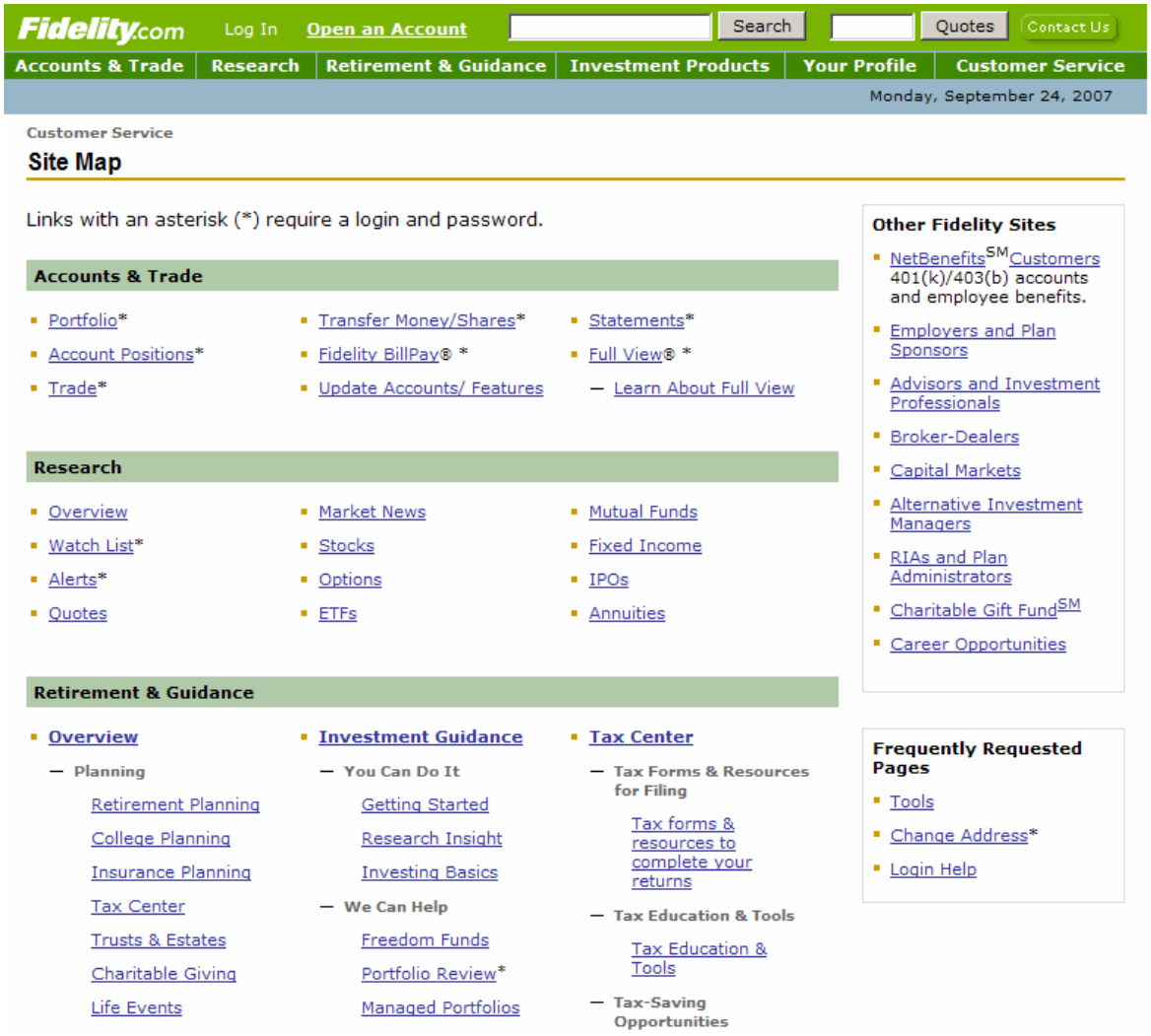

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Figure 3a. U.S. Population Distribution
1985

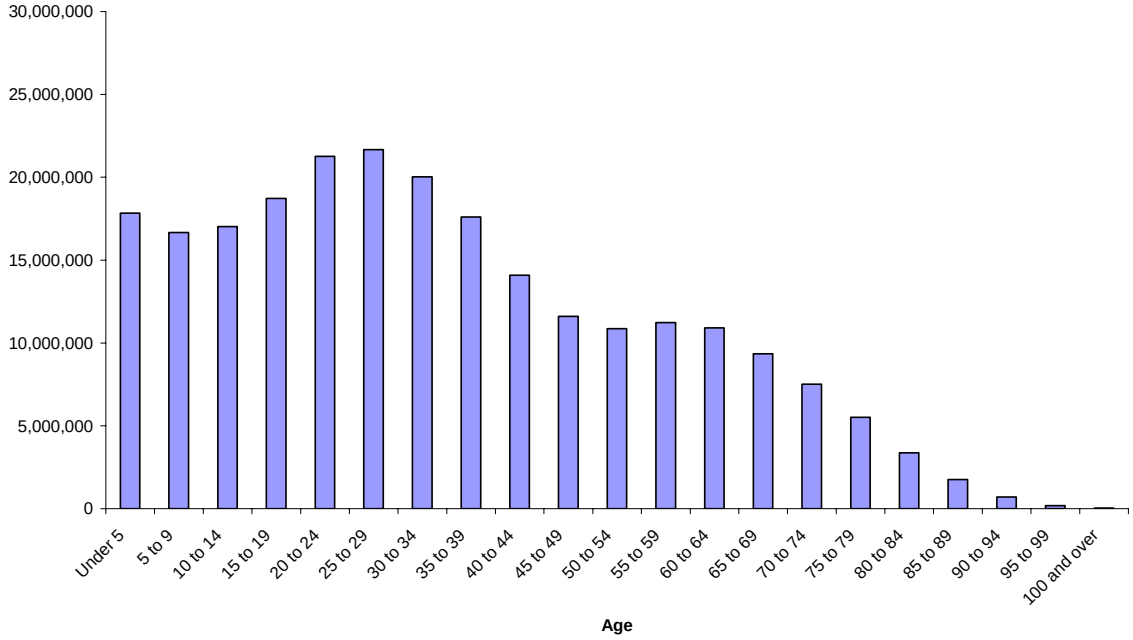

Figure 3b. U.S. Population Distribution
2006

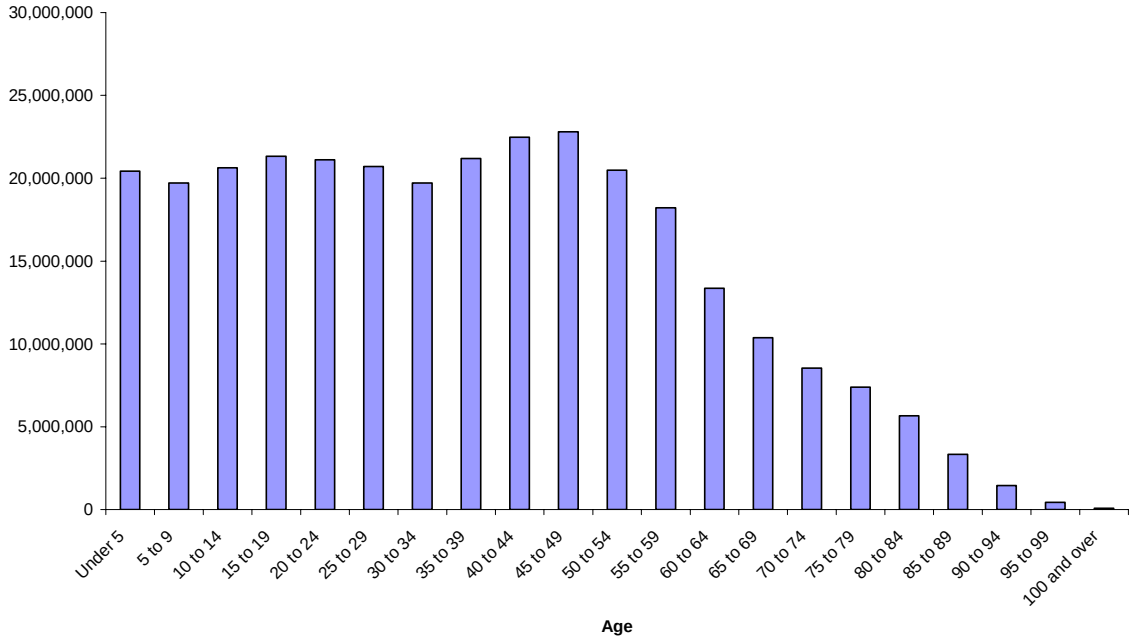

Figure 3c. Projected U.S. Population Distribution
2025

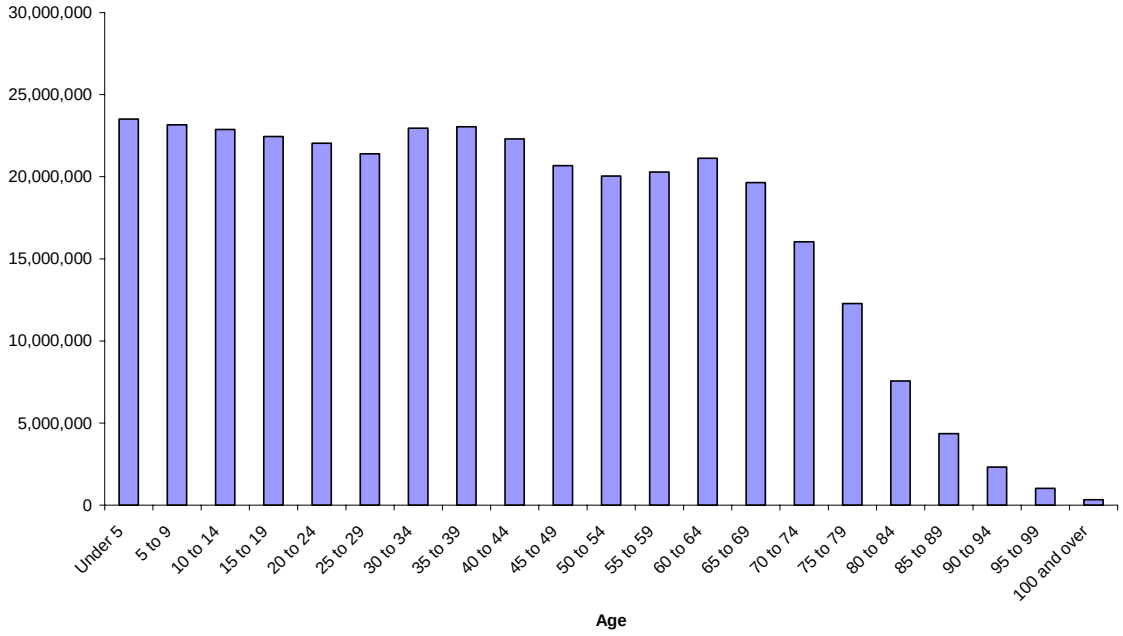

Figure 4. U.S. Population by Age Group (millions)
1980-2025