

Economics' Approach to Financial Planning

by

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Executive Summary

Economists have been developing their approach to financial planning for almost a century. Yale's Irving Fisher provided the first breakthrough, showing that when it comes to consuming their lifetime economic resources households seek neither to splurge nor hoard, but rather to achieve a smooth living standard per household member over time.

This prediction of *consumption smoothing* over the life-cycle reflects the nature of household preferences, specifically the proposition that diminishing returns (satiation) sets in when a household tries to spend all its resources at a single point in time.

Consumption smoothing not only underlies Economics' approach to spending and saving. It's also central to the field's analysis of insurance decisions and portfolio choice. In buying insurance and diversifying their portfolios, households are trying to smooth (even-out) their living standards, not over time, but over times – good ones and bad ones.

Although consumption smoothing is conceptually straight forward, relying on it to provide saving, insurance, and portfolio advice is technically challenging. This reflects the great number of interconnected problems that one needs to solve and the mathematics, particularly, *dynamic programming*, required to solve them. Academic economists have, however, been solving these problems for decades as part of their research first using main frame computers, then work stations, and more recently desktop computers. But their computer programs have taken hours, if not days, to solve.

But improvements in desktop computing coupled with advances in dynamic programming are, at long last, permitting economists to move from simply describing financial problems to prescribing financial solutions. Indeed, incredibly complex consumption-smoothing problems can now be solved on desktop computers in a matter of seconds. (Disclosure -- my company markets *ESPlanner*, the first commercially available software program to implement consumption smoothing.)

Given that economists have primarily been having internal conversations about optimal financial decisions, it's not surprising that the practice of financial planning has developed with little regard to the dictates of consumption smoothing. Conventional planning's targeted liability approach has some surface similarities to consumption smoothing. But the method used to find retirement and survivor spending targets is virtually guaranteed to disrupt, rather than smooth, a household's living standard as it ages. Moreover, even very small targeting mistakes will suffice to produce major *consumption disruption* for the simple reason that the wrong targets are being set for *all* years of retirement and potential survivorship.

Given current technology, there is no need for guesswork when it comes to setting spending targets. Economic programs can find the proper consumption-smoothing spending targets almost instantaneously, taking full account of our highly complex tax and transfer system, changing household demographics, economies in shared living, housing plans, college needs, desired bequests, borrowing limitations, etc.

Economics' software lets planners not only smooth their clients' living standards, but also raise them. Planners can now determine precisely by how much their clients living standards will rise if their clients wait to take Social Security, contribute more to a retirement account, convert their regular IRA to a Roth, choose mortgage A over mortgage B, choose job A over job B, invest in more education, etc.

Planners can also use the new software to price their clients' passions. Specifically, they can tell their clients how much their living standards will fall if they retire early, have another child, buy a cabin cruiser, make regular gifts to their kids, contribute more to charity, etc.

Finally, the new software permits planners to show their clients what really matters when it comes to portfolio choice, namely the level and variability of their living standards. Indeed, Economics' living standard risk/reward diagram will surely replace the conventional mean-variance diagram as the standard framework for seeing the potential pain and pleasure from risky investing. In focusing on what can happen to a household's living standard as opposed to what can happen simply to its financial assets, the new diagram incorporates the risk of non-financial economic resources, such as labor earning, Social Security benefits, pensions, etc. It and related presentations can show that concentrating, rather than diversifying one's portfolio is often needed to diversify one's overall economic resources.

Introduction

This article briefly describes Economics' approach to financial planning and contrasts it with conventional planning. Economics' approach is based on *consumption smoothing* — the proposition that households seek to spread their spending power over time as well as across times – times that are good and bad.

Consumption smoothing follows from the assumption of *diminishing marginal utility*, the commonsense notion that spending more and more at a given point in time yields less and less additional pleasure, which economists call utility. The proper response to diminishing marginal utility is to neither squander nor hoard one's spending power, but rather to spend it smoothly over time.

“Smooth your consumption” or, more precisely, “smooth your living standard” is just one of one of Economics' four basic commandments when it comes to personal finance. The other three are “maximize your living standard,” “price your life-style choices in terms of your living standard,” and “protect your living standard.” All four strategies focus on the household's living standard and emanate from the assumption of diminishing marginal utility.

Intoning Economics' financial commandments and obeying them are two different things. Determining the precise steps to maximize one's utility and achieve the Economic solution requires use of *dynamic programming* and other advanced mathematical techniques. It also requires considerable computer power and detailed attention to tax and Social Security benefit provisions.

Starting with main frame computers, then workstations, and more recently desktop computers, hundreds if not thousands of academic economists in the U.S. and abroad have developed complex consumption-smoothing computer programs to compare actual financial behavior with the Economic norm. Until lately, however, this effort has been purely of a research nature.

Things have changed. Today, thanks to advances in dynamic programming and desktop computing, economists are now in a position to convey their discipline's specific financial recommendations to planners or, indeed, the general public directly, in a matter of seconds. In particular, the new software can determine a household's highest sustainable living standard and figure out ways to raise and protect it. It can also help people price their passions – help them determine the ongoing living standard sacrifices associated with early retirement, having extra children, buying a fishing boat, etc. (Full disclosure. My company markets such a program at www.esplanner.com)

The advent of consumption-smoothing technology seems well timed. Paula Hogan (this journal May 2007) and other leading planners are prodding the planning community to start taking life-cycle planning seriously.

Utility Maximization

The father of consumption-smoothing is Irving Fisher. Fisher was a professor at Yale and America's preeminent pre-War economist. He is perhaps best known for the *Fisher* equation, which shows the relationship between nominal and real interest rates. Fisher's treatise -- *The Theory of Interest* -- provides the first unified economic treatment of consumption, saving, investing, and credit markets. The book, written 77 years ago, contains not only the first diagram of intertemporal consumption smoothing; it also provides a mathematically precise analysis of the problem.

In the 1950s, Franco Modigliani, Milton Friedman, Paul Samuelson, and other economists extended Fisher's analysis, developing a set of results that is now referred to as the *Life-Cycle Model of Saving*. Other economists, notably Harry Markowitz and William Sharpe, used Fisher's two-period model to study optimal portfolio choice. Yet others, starting with Menahem Yaari, used Fisher's framework to study the optimal choice of life insurance and annuities.

This body of work and its voluminous extensions all begin with Fisher's premise – households seek the highest level of utility possible and experience high marginal utility when starving and low marginal utility when gorging. Given that bad times are marked by paucity and high marginal utility and good times are marked by abundance and low marginal utility, households naturally seek to raise their level of utility, on average, by reallocating their spending from good to bad times.

In the saving context, this means moving resources from good times, when one is working and earning money, to bad times, when one is retired and earning nothing. In the insurance context, it means moving money from good times, when the house hasn't burnt down or the principal earner hasn't died, to bad times, when these events happen. And in the investment context, it means diversifying one's resource's so that there is something to eat not just when the stock market booms, but also when it crashes.

Risk aversion, which refers to how rapidly marginal utility falls the more one consumes at a point in time, plays a central role in all of these decisions. Households that are very risk averse know they will have very high marginal utility for consumption in bad times and are particularly concerned to avoid them. Extremely risk averse households will play it safe and avoid risky enterprises, including investing in risky securities, even when the odds of success are very high. Households that are less risk averse will take risky positions, but only if these positions entail better than even odds of success.

Dynamic Programming

In simple situations featuring no uncertainty and no limitations on borrowing, consumption-smoothing, life-cycle spending plans can be calculated using high school algebra. Otherwise their solution requires *Dynamic Programming* – a mathematical technique developed by Richard Bellman in the 1950s, which is used extensively by engineers, physicists, computer scientists, and mathematicians as well as economists.

Dynamic programming helps one solve seemingly intractable sequential problems where what you do next depends on what you do now. Take deciding how much to spend today. If you are trying to smooth your living standard over time you'll need to know what your current spending will leave you with next period and how those resources you bring into next period will affect the following period's spending, which will affect the following period's spending, and so forth into the future. Stated differently, knowing what you should do today requires a game plan for tomorrow. Dynamic programming works out these successive game plans starting from the last period a household member can be alive and working back to the present. This emits a set of interconnected plans – one for each year – but each dependent on the next period's plan.

Deciding when to head to the airport to catch a plane with initial stops at the bank and office provides a simple example of dynamic programming. Most of us would instinctively use dynamic programming to solve this problem. We would solve the program backwards, starting with the plane's departure time, subtracting an hour to check in and go through security, subtracting the time needed to go from the office to the airport, subtracting the time needed to go from the bank to the office, and then subtracting the time needed to go from home to the bank. The end result would be the time to depart from home.

The alternative to this dynamic programming approach is to simply try a range of different potential times at which to leave the house and keep adding in the amounts of time for the different tasks and then see whether that starting time leaves us arriving too early or too late to catch the plane. Such a method will eventually get us to the right answer, but take forever doing so.

Borrowing Constraints

Dynamic programming is particularly useful for dealing with *borrowing constraints* – the inability of households to fully smooth their living standards without borrowing more money than is feasible or desired. Borrowing constraints appear to affect about two thirds of young and middle-aged households. Such households typically either have high mortgage, education expenses, loan payments, or other off-the-top expenses. Or they hold significant retirement account assets, which can't be accessed until retirement.

Borrowing-constrained households face a much more complicated consumption-smoothing problem because they need to smooth their consumption over each time interval during which they are constrained. For example, a typical middle class household whose children will graduate from college will likely be constrained until the children graduate; i.e., this means the household needs need a plan to achieve a stable living standard before the kids graduate as well as a separate plan for a stable, but higher living standard for the years thereafter.

The difficulty of dealing with even a single, let alone multiple borrowing constraints appears to explain why conventional planning has focused simply on finding the fixed annual saving amount or fixed annual saving rate needed to hit arbitrary retirement spending targets.

Consumption Smoothing vs. Targeted Spending

The dynamic programming used to smooth (to the extent possible) a household's living standard delivers a lifetime spending plan. These recommended spending amounts constitute the right household spending targets not just for retirement, but also for each year prior to retirement. Associated with this life-cycle spending plan is a life-cycle saving plan.

In contrast to the Economics approach, which directly calculates appropriate annual spending targets for households, conventional planning either a) asks households to set their own targets, b) uses households' current spending to establish targets, or c) relies on replacement-rates to set targets. While the objective of planners in using these ad-hoc targeting methods may be to smooth their clients' living standards, setting targets in this manner is virtually guaranteed to achieve the opposite result. The reason is that the targets established via this guesswork will almost surely differ from the correct consumption-smoothing targets. And even small targeting mistakes, on the order of 15 percent, can make a major difference in saving recommendations. Why? Because the targeting mistakes are being applied to all 40 or so years of a household's potential retirement and a large number of small mistakes add up.

When retirement spending targets are set too high – higher than the appropriate living standard-smoothing level –, household's are told to save too much and spend too little prior to retirement. When the targets are set too low, household are told to save too little and spend too much prior to retirement. Either way, when the household reaches retirement age, its living standard will change abruptly – its consumption will be disrupted rather than smoothed. As demonstrated in Kotlikoff (2007), targeting mistakes of 15 percent can readily induce 30 percent disruptions in living standards, pre- and post-retirement.

Unfortunately, the size of the targeting mistakes associated with the ubiquitous 75-85 percent replacement rate rule-of-thumb is not 15 percent, but rather well above 50 percent. Households who are subjected to these rules of thumb can easily be told to save many times more than is appropriate

Flawed Insurance Recommendations

Conventional insurance recommendations are subject to the same criticism. They are routinely derived by starting with household- or industry-provided survivor spending targets. Since young and middle aged spouses and partners can face 60 or more years of survivorship, there is again the potential for small targeting mistakes to add up to a very large error. As Kotlikoff (2007) shows, conventional life insurance recommendations, like saving recommendations, can easily be many times too high.

Self-Targeting is Impossible

The notion that households, planners, or financial companies with five-question web calculators can set targets within even 15 percent of the right level is belied by the number and range of current and future variables involved in consumption smoothing. The list includes household demographics, labor earnings, retirement dates, federal, state, and local taxes, Social Security benefits, pension benefits, regular and retirement assets, borrowing constraints, retirement account contributions and withdrawals, home ownership, mortgage finance, economies in shared living, the relative costs of children, changes in housing, choice of where to live, the financing of college and weddings, paying for one's dream boat, ... And each of these variables demands consideration for each and every future year under each and every survival contingency.¹

Taxation by itself is a factor worthy of a Pentium IV processor. Figuring out our taxes when we're alive and when only our survivors are living requires determining in each survivor state whether we'll itemize our deductions, whether we'll receive any of many potentially available tax credits, whether we'll have to pay the Alternative Minimum Tax, whether we'll pay taxes on our Social Security benefits, whether we'll be contributing to or withdrawing from retirement accounts, and whether we'll be in high or low tax brackets. As if this list weren't bad enough, determining future taxes introduces a nasty simultaneity problem. We can't figure out our future taxes until we know our current spending (which determines, in part, our future capital income); but we can't figure out our current spending without knowing our future taxes (which determine, in part, what we have available to spend).

Computing Social Security benefits is another nightmare. With 2728 separate rules in Social Security's Handbook, figuring out what retirement, dependent, divorcee, survivor, mother, father, and child benefits we'll receive can be maddening particularly in light of the system's complex average indexed monthly wage and primary insurance amount benefit formulae as well as the adjustments to the primary insurance amount. These adjustments include the earnings test, the early retirement reduction factors, the delayed retirement credit, the re-computation of benefits, the family benefit maximum, and the phase-in to the system's ultimate age-67 normal retirement age.

Illustrating the Problem

To get a sense of the magnitude of the problem with conventional financial advice, take a 35 year old California couple making \$100,000 a year with two children, ages 3 and 5. The couple has no assets apart from a \$400,000 house with a 20-year \$300,000 mortgage with monthly payments of \$3000. Property taxes, insurance, and maintenance amount to \$7,500 a year. The couple is covered by Social Security, plans to spend \$25,000 in today's dollar per year for four years helping their children pay for college, and anticipates hefty hikes in Medicare's Part B premium. If they need nursing home care, the couple intends to do what most other households of their means do, namely rely on Medicaid. Finally, the couple is assumed to earn 3.0 percent

¹ Survival contingencies are distinguished both by which spouse/partner dies and when he/she dies. The reason is that the survivor will inherit different amounts of wealth, collect different amounts of life insurance, and receive different levels of Social Security survivor and retirement benefits depending on the age at which his/her spouse/partner dies.

above inflation each year on its investments and to plan for the worst case scenario of living to 100.

How much should the couple spend on consumption each year (measured in today's dollars) in order to smooth their household's living standard per person? The answer is \$41,395 when both children are at home, \$35,405 after the first child heads to college, and \$28,886 after the second child leaves home. Once the second child graduates, and the couple gets out from under its borrowing constraint arising from needing to cover the mortgage and college expense, the couple's spending rises to \$30,345 per year and remains there until age 100, assuming each spouse lives that long. The household's living standard per person is \$18,054 until the children are out of college and \$18,965 thereafter.

This is Economics' solution – spend more when there are more mouths to feed and less when there are fewer. But recommended spending isn't proportional to the number of mouths because of economies of shared living and the fact that children are relatively inexpensive compared with adults.

The annual saving required of the couple to implement this plan is anything but constant over time. It's \$2,137 in 2007 and gradually rises, as the real mortgage payment falls, to roughly \$10,000 right before the first child enters college. At this point the couple has accumulated close to \$100,000 in assets. The couple next proceeds to dissave quite dramatically as it uses up its assets to pay for the children's college. In 2024, for example, the saving is negative \$31,430. Once their children graduate, the couple begins saving for retirement in earnest, socking away roughly \$37,000 a year through age 65.

The couple's first-year recommended saving rate is 2.1 percent. But were the couple to follow Ibbotson, et. al.'s (this journal April 2007) "national saving rate guidelines," which is predicated on an 80 percent replacement rate, it would be told to save not 2.1 percent of income but 14.8 percent to 23.8 percent of income depending on which of the study's three guidelines it followed. Note that 14.8 is 7.0 times larger than the economically appropriate number, and 23.8 percent is 11.3 times larger!

As indicated, Economics has the couple spend \$41,395 on consumption in 2007. Were the couple to try to save not \$2,137 in 2007, but \$23,800, its consumption would fall by more than half! According to the "national guidelines," the couple should target to accumulate to \$1,132,295 million by age 65 based on my assumed 3 percent real return. The Economics's guideline, in contrast, is to reach retirement with \$381,173 in assets. A factor of three separates these two pre-retirement asset targets.

Smoothing Saving or Consumption?

Were the household to follow the Ibbotson, et. al. injunction to save, say, 23.8 percent of income each year, it would do precisely what Economics argues against – it would put its saving on autopilot and force its living standard to adjust each year to annual changes in its income and off-the-top expenses. Following such conventional advice would entail the couple's consumption

starting out at \$19,732. Over time it would rise as the real value of the mortgage payment declined. By 2020, the year the first child leaves home, it would be roughly \$30,000. Over the next two years it would fall to \$5,000 (when annual college costs are \$25,000) and then go negative for two years (when annual college costs total \$50,000). This, of course, is impossible. But it illustrates the disconnect between conventional advice and Economics' advice, and, for that matter, common sense.

Rating Replacement Rates

Ibbotson, et. al. (2007) follow industry practice in adopting a very high, in their case 80 percent replacement rate. They also try a 60 percent rate. In point of fact, the ratio of spending at age 65 required for consumption smoothing to income at age 64 for our sample couple is not 80 percent or even 60 percent, but 42.3 percent.

The replacement rate calculation on which Ibbotson, et. al., in particular, and the industry, in general, rely is calculated every three years by the Center for Risk Management and Insurance Research at Georgia State University using the Department of Labor's Consumer Expenditure Survey. The Center was established in 1969 "through grants and general financial support from the insurance industry."² The replacement rate study is financed by AON Corporation, a major insurance brokerage, consulting, and underwriting firm headquartered in Chicago.³

The calculation of target replacement rates is an exercise in reverse engineering. The researchers start with the pre-retirement income of a variety of households (married, single, different income levels) and then make adjustments until they get to the spending being done before retirement. They assume this income needs to be replaced. Then they calculate the pre-tax retirement income needed to cover that spending.

There are five critical problems with the replacement rate methodology. First the calculation assumes that a household's spending after retirement will be precisely the same as its spending before retirement.⁴ This is, to put it mildly, a strong assumption given that the pre-retirement spending being measured includes *all* household outlays be they on consumption, mortgage payments, support for children, education, medical bills, etc.

Second, the replacement rate method ignores new spending needs in retirement. Examples here include taking care of parents who live longer than expected, paying for a country club membership, paying Medicare Part B premiums (which are slated to soar), and paying for home health and nursing home care. Of course, by omitting these and other retirement-specific expenditures, the replacement rate method *understates* the household's future spending needs and, therefore, what it needs to save. For our hypothetical couple, for example, covering the projected rise in Medicare premiums requires a dramatic increase in spending over time, from \$46,494 at age 65 to \$65,794 at age 100, the assumed maximum age of life.

² http://www.rmi.gsu.edu/Center/About_Ctr.htm

³ The original study is posted at <http://www.rmi.gsu.edu/special/Retire%20Project%20-%20old/Retirep.htm>.

⁴ The one exception to this rule is work related expenses.

Third, the replacement rate presumes that the household's demographic composition will remain constant throughout retirement. I.e., it ignores the fact that children will leave the household and that one spouse may be significantly younger than another.

Fourth, the replacement rate approach assumes that retirees use not one single penny of the principal of their assets to finance their retirement consumption. Instead, when it comes to using assets to finance retirement consumption, retirees are assumed to be able to spend only the income earned on the assets.

To get an idea of the importance of using principal as well as income earned on principal to pay for old-age consumption, let's ask how much a 60 year-old with \$500k in assets who earns no income on these assets (his real return is zero) can safely consume each year if his maximum age of life is 100. The answer is \$12,244 on an inflation-adjusted basis.⁵ Now suppose the person can invest in inflation-indexed bonds yielding 3 percent above inflation. In this case, his sustainable level of consumption expenditure rises to \$19,488. So being able to spend principal as well as income on one's assets can account for almost two-thirds of total retirement spending. Clearly, if you spend principal you won't need to save nearly as much.

Fifth, the replacement rate method assumes that the household's current saving behavior is consistent with consumption smoothing, i.e., with maintaining the household's underlying living standard per person through time. There is no reason to believe this is the case. Ironically, if households are already saving the appropriate consumption-smoothing amounts, they have no need for a replacement-rate target. But if they are not, the replacement-rate methodology will produce the wrong replacement rate because it will use actual saving (i.e., the wrong saving amount) in calculating the rate!

One Size Fits None

Applying a single replacement rate to all households, let alone assuming it remains constant throughout retirement, is also highly problematic. Consider, again, our 35 year-old couple. As indicated, the proper age-65 replacement rate is 42.3 percent. If our household holds \$500,000 in regular assets at age 35 rather than zero, the correct rate becomes 47.8 percent. Leave out the kids and we're talking 52.1 percent. Have the childless, \$500K-in-assets couple take Social Security at age 70 and the right rate is 54.7 percent. Assume this transformed couple sells their house at 65, moves to Texas and rents for \$1,500 a month, and the age-65 replacement rate is 65.2 percent, which is more than half again as large as the initial replacement rate.

Clearly, no single replacement rate fits all. And providing national guidelines that make no distinction for all the seemingly minor issues (like spending one's retirement in a state that levies no income tax), which, in fact, make huge differences is, to put it mildly, problematic.

Can Households Save and Insure Too Much?

⁵ It would be \$500k divided by 40 or \$12,500 were it not for taxes...

The above comparison of Economics' and conventional recommendations is not atypical. Conventional methods, as a rule, appear to recommend much more saving and insurance than is economically justified. But can households really save and insure too much given life's uncertainties?

The answer is yes. Economics certainly places much greater weight on downside than on upside risk, thanks to the assumption of diminishing marginal utility. But one of the risks that Economics considers, which is easily ignored, is the risk of spending too little when young and dying before having had a chance to spend too much when old. This risk of squandering one's youth rather than one's money is fully incorporated in the lifetime balancing act that is proper consumption smoothing.

Over-insuring is also an Economics' no-no. The goal of insurance is to equalize one's living standard across good and bad times, not deprive oneself when bad things don't happen in order to live at a much higher level when they do. This is why none of us purchases fire insurance for five times the value of our homes. The same logic applies to life insurance. It's meant to ensure one's prior living standard, not multiply it.

Investment Risk

The concern about over-recommending saving is heightened by the conventional method of evaluating investment risk. This method entails calculating the probability of being able to spend the targeted amount throughout retirement. Households who are given inappropriately high saving goals may be induced to invest in higher yield, but also riskier securities in order to raise the probability of meeting the target. Although it's true that higher yield investing can improve one's chances of success, as so defined, it can also worsen the extent of the downside. In focusing on the probability of meeting the target as opposed to the level to which one's living standard will fall if one's assets perform poorly, conventional planning may be inducing excessive risk-taking.

This problem is compounded by two deeply flawed assumptions. The first, identified by Zvi Bodie (2007), is that holding cash is the "safe" alternative to holding stock. Cash is, of course, not safe since its real return varies with inflation. It also has a negative expected real yield. So comparing investing in this "safe" asset with investing in stocks biases the analysis dramatically in favor of stocks. TIPS, rather than cash, is the appropriate asset for analyzing safe investments, but it seems rarely to be so used.

The second assumption is that households whose assets perform poorly will make no adjustment whatsoever in their retirement spending target. This is obviously unrealistic. A household that shows up at retirement with half the resources it expected to have accumulated should, according to standard Economics, spend half the amount it would otherwise have spent.⁶ Furthermore, the household should adjust its spending each year in light of the current market value of its remaining economic resources.

⁶ Actually, given the progressivity of taxes, arriving at retirement with half the amount of resources one had planned to have will lead to a cut in spending of somewhat less than half.

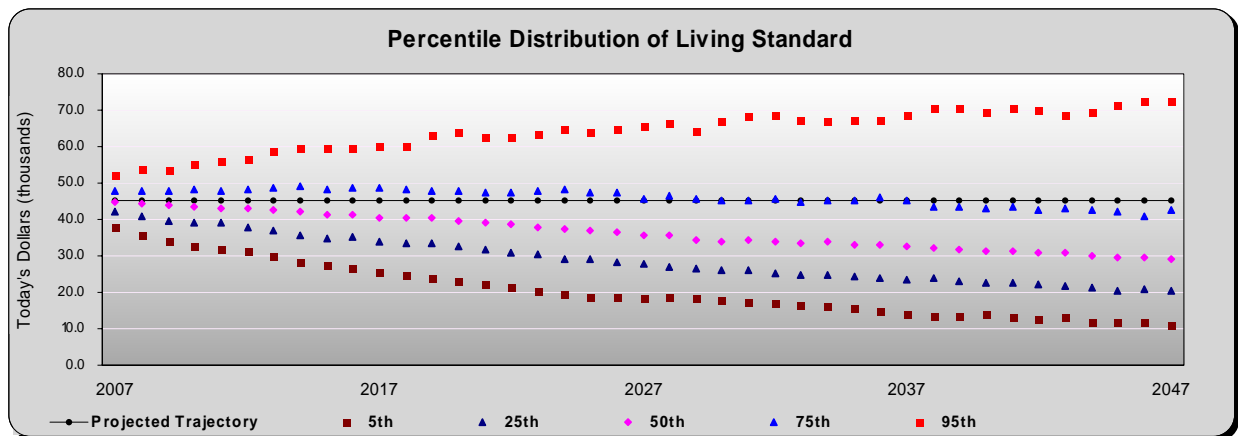
In contrast to the conventional approach to investment risk analysis, Economics' approach is to use dynamic programming to understand how a household will adjust its spending *each and ever year* in light of realized market returns. Rather than focus on the probability of making an inappropriate and inflexible target, Economics stresses the real issue at hand, namely the likely level and variability of the household's living standard.

The chart below shows a living standard risk/reward diagram for a single age-60 year old named Carolyn with no resources other than \$1 million invested in a mixed portfolio of stocks and bonds. The vertical axis measures living standard and the horizontal axis year. The curves, from bottom to top, show the 5th, 25th, 50th, 75th, and 95th percentiles of the living standard distribution for the year in question. The straight line shows the living standard Carolyn could enjoy were she to receive the average real return on this portfolio for sure.

Were Carolyn to instead invest solely in TIPS, she'd be able to spend \$33,296 for sure on an ongoing basis. Doing so entails no downside, but also no upside. By considering such living standard risk/reward diagrams, she'll be able to determine what portfolio best satisfies her concerns about risk.

Spend-Down Behavior

As noted, conventional planning has young and middle-aged households set retirement spending targets, which are then used to make both saving and portfolio recommendations. Curiously, once the household retires, conventional planning drops its prior target and recommends a new one, namely that the household spend each year only 4 percent of the amount of assets it has at the initiation of retirement.



For example, Carolyn would be told by conventional planning to spend \$40,000 a year regardless of whether her assets fall in value from \$1 million to \$100,000 or rise in value from \$1 million to \$20 million.

Economics makes no such recommendations. Instead, it advised Carolyn to modify her rate of spending each year in light of two factors. The first, as just indicated, is the current value of her assets. The larger her assets, the more she should spend. The second is the riskiness of her portfolio. If Carolyn holds a highly risky portfolio, her rate of spending should be lower, indeed, considerably lower. Indeed, Economics requires households that invest aggressively to spend defensively.

The diagram above suggests the importance of this point. It is predicated on non-defensive spending behavior. Specifically, it assumes that Carolyn considers only the mean (expected) rate of return on her portfolio in deciding how much to spend each year. Doing so entails considerable downside risk. At age 80, for example, Carolyn faces a five percent chance of being able to spend only \$20K or less. With more defensive spending, all of the percentile distribution curves will start in 2007 at a much lower level (indeed, much lower even than the TIP spending level), but either not fall as rapidly through time or actually climb.

To summarize, Economics considers what really matters when it comes to risky investing -- the level and variability of one's living standard through time. Such analysis can help one choose how best to allocate one's portfolio and how rapidly to spend down one's assets given that portfolio allocation.

Portfolio Allocation

Conventional portfolio advice suggests that working households invest in life-cycle funds, whose asset allocation changes gradually through time from mostly stocks to mostly bonds. Here again, the economic basis for this prescription is unclear.

In 1969 two Economic Nobel Laureates, Paul Samuelson and Robert Merton, independently showed that stocks do not, on balance, offer a better risk-return deal the longer you hold them. Nor do they offer a worse deal. From an economics perspective, if all of a household's economic resources are marketable (tradable), the risk-return deal looks the same whether the household invests for 20 minutes or for 20 years. Consequently, Economics prescribes the same split between risky and safe assets for long-term (young) as well as short-term (old) investors.⁷

Together with economists Zvi Bodie and William Samuelson (Paul's Son), Merton subsequently modified this prescription to account for the fact that most young and middle-aged households hold most of their economic resources in the form on non-tradable current and future labor earnings. Since the publication of this paper, other economists have included additional salient factors, including borrowing constraints (See, for example, Gomes, Kotlikoff, and Viceira 2007).

⁷ Samuelson's and Merton's analyses go beyond simply considering the statistical properties of the returns on stocks and bonds. They also consider how investor's evaluate risk – their *risk aversion*. For an outstanding analysis of the risk of equity investment see Zvi Bodie's *Worry Free Investing*.

The upshot of this work is first, to the extent that portfolios are invested in safe assets, the appropriate safe asset is TIPS, not long-, medium-, or short-term nominal government bonds. Second, the equity share of regular asset holdings should not smoothly decline with age, but rather follow a roller coaster pattern. To be precise, young households should invest a small to moderate share of their financial assets in stock. They should increase this share dramatically in their middle ages. Then they should reduce this share as they approach retirement. Next they should increase the equity share modestly in early retirement, and reduce this share dramatically in late retirement. Also, at any age, they should set their equity share based on their risk aversion. If their risk aversion is high, they should make their rollercoaster very flat, meaning hold only TIPS.

Raising One's Living Standard

So far I've discussed two of the four Economic commandments – smooth your living standard via appropriate saving and protect it via appropriate insurance purchase, portfolio allocation, and spend-down behavior. I now turn to the injunctions to raise your living standard and price your life-style choices.

Utility maximization clearly enjoins households to achieve the highest possible living standard possible for a given amount of labor effort. Doing so requires making a host of very difficult decisions correctly. These include choosing the right educational investments, the right career, the right state in which to reside, the right city in which to live, the right job, the right house to buy, the right mortgage to use, the right retirement account to start, the right contribution to make, the right age to start collecting Social Security, the right age to start retirement account withdrawals, the right age to take one's pension, etc.

Each of these decisions can have very significant living standard implications. But conventional planning can assist with none of them for the simple reason that it fails to calculate the key variable of interest – namely the household's standard of living. In contrast, Economic models can determine in a matter of seconds which of these moves will raise any particular household's living standard and by how much.

Take, as an example, a typical middle class retired couple that's age 62. The couple can opt to begin collecting Social Security immediately or wait to collect. If it waits eight years, its initial real benefit level will be 75 percent higher. That's the good part. The bad part is having to wait the eight years to begin collecting. If the couple knows for sure that both spouses will die by, say, age 75, they should obviously begin collecting immediately. But if their maximum age of life is, say, 100, it's not so clear what's best. In addition there are tax issues. If the couple has retirement accounts and withdraws these funds early, while taking Social Security late, it may be able to reduce, if not eliminate, the income taxation of its Social Security benefits. Having run a variety of such cases through ESPlanner, I can testify that waiting will likely raise the living standard of most such households by 10 percent on a permanent basis. This is an exceptionally large living standard hike; indeed, achieving the same increase would require a roughly two-year postponement in the retirement of most households.

Pricing Our Passions

Pricing our passions is critical to getting the most out of our spending power. Imagine having to buy the week's groceries at a market that doesn't post prices. We'd surely end up spending too much on things we thought were cheap, but were actually expensive, and too little on things we thought were expensive, but were actually cheap. We'd be spending blind and getting too little utility for our money.

The ability to calculate a household's living standard means one can price all of its life-style choices in terms of the living standard sacrifice these choices entail. Take, as an example, Frank and Stacy Loveless. Frank's 45, Stacy's 38. He's a dentist, she's a dietician. They live in Saint Louis with their two kids, ages 7 and 3. Frank's the big earner, netting \$150K a year. Stacy earns \$30K. The practice, were Frank to sell, is worth \$300K. The couple has \$500K in regular assets and a \$500K house with a \$200K mortgage. Frank has \$200K in his 401(k).

Stacy is considering asking Frank for a divorce. Frank wants to stay married, but if Stacy opts for the divorce he's willing to give her the house and all their regular assets, but no more. He'd keep his practice and 401(k). He'd also pay \$15K per year per child in child support, but nothing in alimony. Frank claims this is more than fair. But in any case, it's the most he's willing to fork over knowing, as he does, that the courts would probably split the assets and award no alimony.

If they stay married, Stacy's living standard will remain at its current \$53,219 value. If she gets divorced, it will drop to \$23,659. That's a big hit. But if Stacy has no way of knowing the size of this hit, she may mistakenly push for a divorce and then spend the rest of her life regretting that decision.

Conclusion

When it comes to personal finance, Economics keeps one issue front and center – our living standards. Spending, saving, insuring, and investing – all of these decisions boil down to smoothing our living standards, protecting our living standards, and making informed, careful gambles to raise our living standards.

Virtually all other personal financial questions begin and end as well with our living standard. Can we afford the addition? Can we retire in Hawaii? Can we help the kids buy a house? Does converting to a Roth IRA make sense? Does taking out long-term care insurance beat self-insuring? Does it pay to get an MBA? Does this high-rate, no-points mortgage beat that low-rate, 2-points alternative?

Economics can finally answer these and hundreds of similar questions and take the dangerous guesswork out of much of personal finance.