

Financing Retirement: Saving, Investing, Spending and Insuring

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Today I'm going to talk about something that used to be a problem primarily for the rich. In my generation, average people had very few decisions to make about financing their retirement. You worked for an employer, retired, got your checks from the government and the employer until you died. And, if your partner outlived you, he or she got checks after you were gone. No risk, no decisions. And, of course, no upside potential.

How times change. In my children's generation, average people, like academics such as myself before them, now have to decide how much to save for retirement and how to invest it, within the limits provided by their employer. When they retire they have to decide whether or not to buy an annuity from an insurance company that will pay them until they and/or their partner die and, if they do so, whether the annuity payments will be fixed or will vary with the level of the stock market. If they don't use all their money to buy an annuity (and most don't), they have to decide how much to spend each year and how to invest the rest. Social security remains as it was, but proposals to change it resurface periodically – usually in years in which no one is running for office.

Not surprisingly, many average people are ill-prepared to make the complex financial decisions that are now required. There are two reasons. First, most lack sufficient information about financial risks and returns. And second, many lack sufficient foresight and/or self-control. Those who practice and study finance need to provide all the help they can. And there is a key role for sensible social policy in this crucial area.

Today I would like to talk about some of the issues associated with this sea change. Why has it happened? What does the future hold? What are some of the public policy issues? What can financial economics contribute? And what new products and services can financial institutions provide? Of course I can only skim the surface but hopefully this will provide a framework as you think about these issues.

Why has this happened?

My answer -- demographics.

In a given year, a country, region or the world produces a set of goods and services. Think of this as a pie that is divided among young people (say, under 20), working age

people (say 20 to 64) and elderly people (65 and older). The rest of the pie is used for productive investment that will hopefully make future pies larger.

The key fact is that the ratio of elderly people to working age people has increased and is projected to increase even more. Here are some numbers from the U.S. Census Bureau. For every 100 working age people in the more developed countries there were 14 elderly people in 1950. There are 25 now. This is projected to rise to 50 by 2050.

These numbers vary considerably across countries. At present, for every 100 working age people there are 9 elderly in India, 12 in China, 20 in the US, 29 in Western Europe and 31 in Japan. Not surprisingly, the rate of growth in GDP per capita has been greater in the countries in which the working age people have fewer elderly people to support.

By 2050 all these ratios are projected to increase. At that time the ratio in China will be 42-- considerably greater than the ratio in the US. Some have said that China's biggest task is to get rich before it gets old.

The graying of the population is not limited to more developed countries. For the world as a whole, the ratio of elderly to working age people is now only 13 but by 2050 it is expected to be 30. There will still be substantial disparities among countries. For the now more developed countries the ratio will be 50 while it will be only 27 in the now less developed countries. The good news is that global trade and immigration can mitigate the problem. The bad news is that it can't solve the problem completely.

The causes of these changes are obvious. We have fewer children and we live longer. We are going to have to work longer, save more while we are working, or both. But why do we need to save in the new way rather than the old?

My answer -- economic uncertainty.

If we knew the size of each year's total output pie there might be no reason to change. But we don't know it. There is always the risk of a downturn, a recession or worse. Now consider what happens in such a case under the old system. The pie gets smaller but the elderly have a fixed claim on output. Therefore the amount going to the working age and young people has to decrease by a greater percentage than does the total output. All the risk is borne by the young and those of working age. This may have been sensible when there were 14 elderly people for every 100 of working age but almost certainly is not the best way to allocate risk when there are 25, let alone 50.

In short, we need to be able to share risk to at least some extent between the young and the old, and the old system did not do this. We need mechanisms so at least some people can take at least some financial risk.

Newer social retirement savings plans in some countries tie retirement checks to current national income or earnings. In the U.S., private plans such as 401(k) plans allow each worker to decide how much risk to bear before retirement and after.

Looking at this from an investment viewpoint, in the older private retirement plans, workers in effect got bonds both before and after retirement. But in some of the newer plans a worker can invest retirement savings in bonds, stocks and/or other assets. Under the pressure of changing demographics, retirement systems are changing to permit more efficient sharing of overall economic risk.

But allowing for better risk sharing doesn't mean that we will get it. If individuals are to make their own financial decisions they need to know what they are doing and to make rational decisions that are in their long-run best interests. Moreover, governments need to design efficient social programs and operate them responsibly. On both fronts reality falls far short of the ideal.

Retirement Savings in the U.S.

A traditional pension plan is termed a *defined benefit plan* since the amount to be received by the employee in retirement is specified, with the employer left to make investments, take the associated risk and get the associated return. According to EBRI, the Employee Benefit Research Institute, at the end of 2004 the assets in such plans were somewhat under 1.9 trillion dollars.

A 401(k) plan is termed a *defined contribution plan* since the amount contributed each year by the employee and employer is specified but the amount available during retirement depends on investment performance. At the end of 2004 EBRI estimates that these and other such plans had over 2.5 trillion dollars of assets.

There are even more assets in so-called IRA (individual retirement) accounts, many having been rolled over from defined contribution plans. At the end of 2004 these assets amounted to approximately \$3.5 trillion dollars, according to EBRI.

The ratio of assets in defined contribution plans to those in defined benefit plans has been increasing for a decade and shows every sign of continuing to increase in the future.

In the United States, Social Security will provide a large part of most peoples' retirement income. Moreover, it serves as a safety net since it is a defined benefit plan. But its liabilities greatly exceed its assets. According to the 2005 report of the Trustees of the system, to be able to pay benefits to current participants (working and retired), in addition to the future payroll taxes to be paid by those still working, almost 14 trillion dollars in government bonds would have to be in the famous lockbox. Unfortunately, less than 2 trillion dollars worth were there at the time. The unfunded liability was thus 12 trillion dollars – roughly equal to the annual gross domestic product of the U.S.,

This is certainly bad news. But in an important sense, the Social Security system is not broken. The 2005 Trustees report also shows that for future participants from now to

infinity, the present value of future payroll taxes actually exceeds the present value of future benefit payments (but only by a tiny amount). And an actuarial report issued by the Social Security system in 2004 showed that stopping the program at that time, so that no further benefits would be accrued would have required over 13 trillion additional dollars. The problem is thus the past, not the future.

This is discouraging, but there are worse bills to be paid. In 2005 Kent Smetters and his colleagues estimated that the present value of the shortfall for Medicare parts A and B was approximately 39 trillion dollars. To this, an additional shortfall of 24 trillion dollars was added when Medicare part D was passed. Only in Washington can folks vote for a new benefit underfunded by 24 trillion dollars then complain that an old one underfunded by 12 trillion dollars is unsustainable.

Let me note in passing that just changing part or all of Social Security to a defined contribution system will not help solve this problem. One way or other benefits must be reduced and/or taxes must be increased. Moreover, although we need some way to allow more risk-sharing between the old and the working age population this does not mean that we have to have the social safety net vary with economic conditions and/or investment results. It may be good social policy to leave the Social Security system alone, with general tax revenues funding future shortfalls, and allow supplemental savings to be invested individually.

The Pension Protection Act of 2006

While on the subject of Washington I should say a few words about the recently passed Pension Protection Act. It is long (over 900 pages) and complex but appears to be well-intentioned. Many of the provisions concern defined contribution plans but there is considerable emphasis on defined benefit plans. Recall that such plans promise workers specific payments in retirement paid by the employer. To guarantee such payments the employer is supposed to put an adequate amount of money in a separate trust fund. Then the money can be invested in bonds, stocks, hedge funds, or whatever.

One might imagine that an employer would put aside enough money each year to buy bonds that would fund the benefits earned that year, then invest the money in such bonds. But most employers do otherwise. The amounts contributed each year are determined by a mixture of regulations, accounting procedures and actuarial analyses. In many cases the contributions are much less than required to guarantee all the accrued benefits. To take an egregious example, when government bonds were yielding 4%, some plans computed the present value of future benefit payments by discounting the payments using an interest rate of 8% or more. This wildly understated the economic value of liabilities, making such funds appear to be well funded when in fact they were significantly underfunded. Other procedures were used to smooth asset values, so that a fall in the value of a portfolio would be reflected in full only over several years. And in the first years of this century there was a perfect storm, with stock prices falling and bond values rising as

interest rates decreased. For many funds the true economic value assets fell just when the economic value of liabilities was rising. In too many cases only actuarial and accounting legerdemain kept the reported numbers from reflecting this reality.

For these and other reasons, employees in many private pension plans had claims that were more like bonds issued by their employer than default-free government bonds. In 1974, Congress tried to mitigate this by providing that in the event of a corporate bankruptcy a quasi-government agency, the Pension Benefit Guaranty Corporation (or PBGC) would take on a plan's assets and liabilities. However, not all benefits are covered in full, as the pilots of United Airlines recently discovered. And in September, 2005 the PBGC reported that it had assets of 57.6 billion and liabilities of 80.7 billion and was thus 23 billion dollars in the hole.

The Pension Protection Act improves this situation in a number of ways. It increases the insurance premiums that must be paid by corporations who sponsor defined benefit plans, it mandates better funding of such plans and requires valuation more in line with the true economics of the situation. But it goes only part way. And there are the usual exceptions intended to make it easier on some corporations -- in particular the airlines.

A cynic might say that a traditional corporate defined benefit plan was a ruse that allowed an employer to get workers to accept lower wages and salaries in return for a benefit that appeared to be like a portfolio of long-term government bonds, but was instead a portfolio of corporate bonds, some of which were actually junk bonds. The recent legislation, along with planned changes in the same direction by the Financial Accounting Standards Board may make such a game harder and more expensive to play. This is a serious step forward although it may lead to an acceleration in the demise of defined benefit plans.

For good or ill, the provision of a traditional defined benefit pension plan appears to be on the way out in corporate America. However, it may remain the preferred vehicle for many employees of governments and government agencies for which taxpayers are the ultimate source of benefit payments. In any event, the defined contribution plan is here to stay in corporate America. We had better find a way to make it work.

Saving, Investment, Spending and Insuring Decisions

The first step is to acknowledge that uncertainty abounds. We don't know what most investments will return. We don't know when we will die. We don't know the magnitudes of future medical expenses. And so on. Individuals can mitigate or even avoid some uncertainty but not all. Societies can reduce overall economic uncertainty but they cannot eliminate it. They can, however, assist in allocating societal risk among people efficiently.

Fortunately financial economists spend much of their lives dealing with decisions in a world of uncertainty.

Pre-Retirement Saving and Investment

In the early 1990's I looked at the retirement saving and investment advice being offered by financial institutions, mutual funds and others. Much of it was fantastic -- as in "fantasy". Calculations were based on saving a specified amount each year until retirement, earning a constant percent return each year on investments, spending a specified percent of total savings each year after retirement, then dying at an appointed hour. The typical output graph showed the total value of savings, growing steadily until retirement then decreasing steadily until the grim reaper's prearranged arrival date. As long as there was something left, the individual would be congratulated on having a "plan that works".

Not surprisingly this didn't seem adequate to financial economists. Hence a number of us went to work to see if we couldn't find a better approach. My own efforts have included academic research and the founding of a firm that provides investment advice and management. An employee in a plan for which we give advice is given estimates of the likelihood of meeting certain retirement financial goals, not a single number purporting to be his or her retirement income. The portfolios that we recommend or manage provide ranges of retirement outcomes that are efficient, taking into account not only the middle of the range but also its width. In short, we quantify risks, make the best estimates we can of those risks, and select investment strategies that are projected to get the best possible return for the amount of risk appropriate for the investor in question. Our goal is to bring the results of decades of theoretical and empirical research in financial economics plus some of our own work to bear on the retirement financing decisions made in the working phase of one's life.

The Pension Protection Act contains some provisions that help in this regard. Employers are encouraged to adopt provisions which specify that by default a new employee is automatically included in a 401(k) plan, with a minimal amount to be saved each year and invested in a reasonable default option such as diversified portfolio or a personalized managed account. The employee can choose to not be included but this takes explicit action. Research by behavioral economists has shown that participation rates are significantly higher when inertia leads to participation rather than non-participation. In a relatively short time, research conducted in the academy has led to good legislation.

The Act also widens the scope for the provision of financial advice to those in 401(k) plans. Previously only a non-conflicted firm could provide such advice. Now firms that stand to make more money if, for example, an employee invests in mutual fund A rather than mutual fund B can provide advice on investing in such funds, but only if the advice is produced by a computer model that has been certified as unbiased by an appropriate third party. The practical implications of this provision are unclear at present, but the

intent is to help people who are not investment professionals make the best decisions about their retirement savings and investment.

Post-Retirement Spending, Investment and Insuring

Until fairly recently, the majority of the activity devoted to bringing financial economics to individuals in this domain focused on those who were still some years from retirement. But here too the inevitable force of demographics has been at work. The oldest baby boomers have now turned 60. A huge wave of retirees is coming. As a result financial economists and financial institutions have begun to focus serious resources on the problems associated with spending, investing and insuring in the retirement years.

Not surprisingly, given my age, I am keenly interested in these problems and I am devoting much of my research to them.

Here too, uncertainty is central. But there are two equally important types of uncertainty. We don't know what most investments will return and we don't know how long we will be around. In the academy we need to combine actuarial science with financial economics. In the financial industry we need to combine insurance expertise with investment expertise.

Consider this prototypical example. You retire with one million dollars in your 401(k) account. You could go to your favorite life insurance company and buy an annuity. You give them the million dollars and they promise to pay you X dollars per year as long as you live and to pay your partner one-half X dollars per year for every year thereafter that he or she is alive. This totally removes the financial uncertainty associated with mortality.

With social security and many traditional defined benefit plans everyone receives an annuity. In many corporate plans the checks were for the same dollar amount each year. In many government plans and for social security payments the amounts were adjusted to take inflation into account. In any event, individuals didn't have to worry about outliving their savings.

But now many people have a choice. The early evidence in this country and longer-term evidence in other countries suggests that given such a choice, most people reject annuities. Instead they invest their savings, spend an amount each year that they think may be appropriate, then accept the risk that they may outlive their money or have to drastically cut their spending.

This seems puzzling. In the old system did we force people to accept an inferior alternative? Or are people now taking far too shortsighted a view? Are the annuity terms offered by insurance companies to individuals so much worse than those offered for group policies that it is better to avoid insuring against the financial costs of long life? These and other questions are the subjects of much current research.

Maximizing Expected Utility

The annuity puzzle is part of a bigger question. How should one approach the problem of selecting an appropriate post-retirement spending, investing and insuring policy? We have many tools that served us well when considering pre-retirement decisions, including mean/variance portfolio optimization, equilibrium models such as the capital asset pricing model, Monte Carlo simulation and others. But these do not appear to be completely adequate for this new task. My view, and that of a number of others doing research in this area, is that we need to first return to fundamentals, viewing the goal as one of maximizing an individual's expected utility, taking into account the amounts that can be spent in different years under different circumstances and the available set of financial and insurance alternatives.

This is not the place to go into specifics but this broader view allows one to consider many aspects of these decisions in a unified and consistent manner, although at the cost of considerable complexity, heavy informational and computational demands and the need to seriously study each individual's preferences.

A particularly important aspect of individual preference is this: The utility that I get from a particular amount of spending depends on the amount I spend, when I spend it, and my circumstances at the time. For example, how do I think about taking risk that will affect my income ten years from now? Let's say that I can choose to have \$100,000 for certain or a 50/50 chance of getting either \$80,000 or \$150,000. Which will I choose? If I knew that I would be alive and well at the time I might well take the gamble. But if I knew that I would be in a skilled nursing home and that the cost would be \$100,000 I would very like take that sure thing. In economists' jargon, my utility is state-dependent.

If we can obtain valid information about such preferences as well as the investment and insurance alternatives, we know how to find a spending, investment and insurance strategy that will maximize an individual's expected utility. But many PhD dissertations and extensive research in the financial industry will be required before there will be widespread practical use of such an approach. In the meantime, parts of the overall intellectual structure can be used to help solve some immediate problems.

Here is a brief example.

Integrating Long-term Care Insurance with a Variable Annuity

Today it is possible to buy a variable annuity that will pay an amount each year that will be greater, the better the performance of an associated investment portfolio. It is also possible to buy a long-term-care insurance policy that will pay a fixed amount each year while the holder is infirm. One can, of course, put some money in one of these policies and the rest in the other. But these policies can't be used to accomplish the goals of the person for whom the best choice is to guarantee a given amount (say \$100,000) when sick and to take an attractive gamble that will pay an uncertain amount that may be less

or more (say, \$80,000 or \$150,000) when well. To my knowledge, payoffs of this sort are not possible with present financial products. But if I am right, demand will create the needed supply. Insurance companies take note.

Conclusion

It is time to conclude.

These are exciting times for financial economists, for people in the financial services industry and for those seriously concerned with good social economic policy. We need to figure out how much to entrust individuals with their lifetime financial decisions and then constrain them, cajole them and/or assist them so they may make decisions that will truly increase their personal welfare.

A tall order, but financial economists can help. Of course you would expect me to say this.