

**SOCIAL SECURITY AND INDIVIDUAL ACCOUNTS
AS ELEMENTS OF OVERALL RISK-SHARING**

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THE IMPLICATIONS OF FINANCIAL AND NONFINANCIAL RISK FOR PUBLIC PENSION REFORM[†]

Social Security and Individual Accounts as Elements of Overall Risk-Sharing

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The widespread public and political impetus, in the United States and elsewhere, to revamp social security to incorporate some form of individual accounts creates a time of opportunity. It is a time when people want to see the better exploitation of the available trade-off between risk and return and a time to reconsider the foundations of the social-security system so that it can much better serve its intended purpose as a manager of risks.

As I argue in my new book, *The New Financial Order: Risk in the 21st Century* (Shiller, 2003), the time when we redesign social security ought to be a time when we carefully consider the fundamental intergenerational risk-management problem and define choices in individual accounts that reflect the true problem. It is also a time when we must make creative use of insights from behavioral economics that have emerged over the years. Finally, it is a time for an expanded exploitation of our new electronic information technology.

We should not miss this opportunity. This means we must work now toward solving a complex constrained optimization problem where the objective is to maximize a social welfare function involving all generations and the constraints reflect the varying degrees of individual optimization ability, psychological underpinnings of human behavior, and modern information technology.

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I. The Fundamental Risk-Management Problem

The aspect of individual accounts that has received the most stress in recent political discussions is that these accounts would help individuals to participate in the opportunities, in the form of a risk–reward trade-off, offered by corporate equities and other investments. The stock market has indeed offered high returns in the past (over 7 percent real per year in the United States over the last century [see Jeremy J. Siegel, 2002]), and so it is reasonable for people to want to take advantage of such returns in planning for retirement. However, any government intervention to promote this requires careful attention to the risks. Gary Burtless (2003) shows in his paper in this session just how risky investing for retirement can be.

Because of the uncertainty, few serious proposals today advocate asking people to depend entirely on the success of their investments to fund them in their retirement. The pay-as-you-go system in force today reflects the risks of investing, and the pay-as-you-go system remains an integral part of the major proposals for reform.

The major proposals are adjustments to the pay-as-you-go system to incorporate an individual-account component. Adding an individual-account contribution of 2–4 percent of labor income and allowing people to choose the mix of equities versus other investments as recommended in 2001 by the President’s Commission to Strengthen Social Security, may mean, depending on how it is implemented, that people who do not now invest for their retirement will begin to share some of the risk and accompanying rewards that the rest of our society faces. But this will not in itself create a system in which risk-sharing is pursued optimally.

The life cycle, the process of growing up, starting work, bearing children, finishing one's life's work, and then living in retirement, encourages an individual time pattern of stock ownership over life that bears no necessary relationship to the investment opportunities that society as a whole faces through time. A simple two-period overlapping-generations model (Shiller, 1999) will illustrate. Suppose that each person when young and investing for retirement has both an exogenous, risky, physical investment opportunity (whose outcome becomes known when the person is old and retired) and an exogenous, riskless, physical investment opportunity with lower expected return, and suppose also that each person is able to choose any mix of these two. Without government intervention, no intergenerational risk-sharing is possible, since it is impossible to make a deal with the unborn, and each person must decide when young how much to put into these two investment opportunities, knowing that he or she alone bears all the risk.

Governmental intervention can improve the risk situation, in effect creating a "deal" between them and the unborn next generation, promising to share the risk and rewards of the outcome of the risky investment between the young and old alive at the same time next period. The deal can be implemented through the compensation and benefits formulas. If the investment turns out badly, the young will help out the old, through higher pay-as-you-go contributions, thereby raising benefits. If the investment turns out well, the old will help the young, through lower pay-as-you-go benefits, thereby lowering contributions. With such a deal (which of course cannot be arranged with the unborn unless the government imposes it), people, now partially protected from the risk, should be willing to tilt more toward the risky investment when they are young, thereby benefiting both them and the new young next period. The implied "tax" on stock-market returns in individual accounts should not be viewed as really a tax, but as a mutually advantageous risk-management deal between young and old.

Making such changes in the contribution and benefits formula is a far more fundamental step toward encouraging the proper exploitation of the risk-return trade-off than compelling people to invest small amounts in individual accounts

with a selection of stock and bond funds. Indeed, if people are fully rational and already have portfolios of stocks and bonds, such a step should have no effect at all, since people can completely offset its effects by making offsetting changes in their private portfolios. In contrast, imposing a risk-sharing deal between generations produces a genuine incentive for people to choose heavier exploitation of risky investment opportunities.

II. Defining Choices in Individual Accounts

Plans for choices in individual accounts should also be plans to create accounts that really help people to diversify their risks. This means creating choices that allow people to tailor their portfolios to their individual risk situations, choices that should reflect genuine differences across individuals in investment needs or preferences.

The President's Commission recommended that there be conservative, medium, and growth balanced funds, thrift savings plans including an international investment fund, and an indexed bond fund. This set of funds (which resembles that implemented today in other countries, such as Hong Kong or Sweden) allows people to make choices in a number of dimensions. Those people who think that growth stocks will outperform other investments can buy the growth fund. Those who think that foreign investments will outperform U.S. investments can purchase an international fund. However, among the general population, relatively few people are likely to have well-formulated opinions regarding such choices.

The most salient choice that is offered with such plans appears to be a choice of level of riskiness. People who are very averse to risk can choose the indexed bond fund, those who are least risk-averse can choose the growth fund. However, consistent differences across individuals in risk tolerance are not really terribly prominent. Robert Barsky et al. (1997) found only small differences across individuals in risk tolerance that were reflected in their life decisions such as life-insurance purchases or decisions to take on risky health behaviors. Shlomo Benartzi and Richard Thaler (2001) found that people appear to make decisions about the riskiness of their portfolio in ways that are heavily

influenced by framing and generally do not make consistent decisions in view of the riskiness of their overall portfolio.

The time when individual accounts are first created should be a time for instituting a set of new kinds of investment vehicles that offer people real choices along dimensions across which people really do sensibly differ. There is a role for the government in creating and promoting such new investment vehicles. One might think that the private sector would already have created such funds, but the private sector is not always a good innovator. Problems faced by the private sector include the high cost of educating the public, a slow time frame for public adoption of new ideas, and virtual certainty that the gains to doing so will later be grabbed by competitors.

One of the funds recommended by the President's Commission, the indexed bond fund, was created by the government (in 1997), not the private sector. The fact that the government was first to issue the indexed bonds illustrates the limitation of the private sector in creating new investment vehicles. The same kind of governmental innovation that created the indexed bond fund should also create funds that allow people to hedge their fundamental risks.

An important difference across individuals is in their individual income risks. Some people have very risky occupational outlooks and so may want to pursue more conservative investment portfolios to compensate for this risk. Ideally, they would also want to try to invest in portfolios that help them hedge their risks, although such portfolios do not now exist.

If we had the kind of "macro markets" on occupational incomes, along lines that I proposed in Shiller (1993), it would be highly natural to give people a choice of hedging their occupational income. The macro securities that Allan Weiss and I patented in 1999 would possibly make that a reality.¹

Another important difference across people is in their desire to consume housing services. Some people desire large houses, as for example people who have many young children, and the investment in a house must then also serve

the purpose of saving for retirement; it also generates home-value risks that could be hedged within individual accounts.

Yet another important dimension across which individuals differ is desired time of retirement. There are differences in experienced job satisfaction, in the career trajectory and anticipated future earning power, in health and ability to function well in a job environment, in family obligations, and so forth. People may also want to retire for a while and then reenter the workforce. An individual-account system can make it more convenient for people to plan for their retirement in terms of their own needs and desires, weighing these against the ultimate financial constraints that face society, and not timing these to coincide with arbitrary thresholds set by the government. We already see this implemented in the Chilean social-security system, where a user-friendly computer system allows workers to calculate the financial trade-off between retirement income and age at retirement.

An investment choice that would be helpful would be a fund that is short the U.S. economy and long the world economy. While this may be the most politically difficult option to include, it would provide a very useful dimension of international risk-sharing. The international portfolio envisioned by the Commission to Strengthen Social Security would allow investment abroad but not provide any hedging of U.S. risks (see Stefano Athanasoulis and Shiller, 2001).

III. Using Knowledge of Behavioral Economics

Virtually every country has a social-security program that is mandatory, forbidding opting out of the program. There must be an important justification for such government intervention over such a wide variety of political environments.

A fundamental motivation for the adoption of governmental social-security systems has always been that many people just do not plan for their own future and will put themselves in penury in their old age unless someone forces or otherwise encourages them to save for retirement. Society will feel obligated to bail them out of their predicament if they do not, so it is legitimate for society to impose on them in advance some planning for their future years.

This was clearly a prominent argument in the discussion in Germany that led to the very first

¹ *Proxy Asset Data processor*, U.S. Patent No. 5,987,435, 1999.

national social-security system, which Germany adopted in the 1880's. G. Behm, in his 1874 paper on social security for the Society for Social Politics (*Verein für Sozialpolitik*), observed that many people do not think much about the distant future (Behm, 1874 pp. 141–42):

From my experience, I have to say it is very doubtful that any substantial number of workers would on their own sign up for a pension plan. . . . Because of the exigencies of the moment, and because of daily concerns, the thought of the future is pushed back, and so the workers in the absence of pressure from outside will not reach the conclusion that they should make the expense to take action for themselves for this good purpose.

The same considerations were operative in the 1930's when the United States adopted its mandatory social security system, and they are operative even today when the system is under reconsideration.

These are differences across individuals in "propensity to plan." Some individuals spend a lot of time thinking about the distant future, and others do not. Such differences matter a lot. John Ameriks et al. (2002) have shown, using survey data, that such propensity to plan correlates positively with eventual wealth later in life, even though it does not correlate with survey measures of the discount factor or the bequest motive.

Given that so many do not plan, it may seem odd to give individuals some choice in the way their social-security contributions are invested. If the system is mandatory since many people would not bother to provide for their old age at all, it is hard to see that they can all be expected to make good choices.

In fact, one must view design of social security as requiring "human financial engineering," just as mechanical engineering often requires "human-factors engineering" that works around human foibles. Just as engineers design an automobile control system that is less vulnerable to human error, so too must social security be designed around various human judgment errors to allow better provision of economic security.

Most people will blithely go along with a plan that is presented as a default option, the

do-nothing option. Design of social security must pay careful attention to the default option for investing in individual accounts, designing it carefully around parameters of the individual's situation, as is revealed by government statistics such as income-tax data. The government can effect most of the desired changes without coercion merely by defining the default option correctly, implementing it with modern computers, and designing the steps that must be taken by individuals to change the option, steps that signal attention to the issues.²

IV. Exploiting New Information Technology

With new information technology, the formulas defining contributions and benefits can be made much more complicated, depending not only on returns earned on investments such as investments in the stock market, but also much more on individual-specific or cohort-specific factors. Computers can calculate these things on an individual basis and in light of extensive databases of information. This can be done cheaply today, whereas in 1935, when Social Security was created in the United States, it would have been very costly or impossible.

A rise in labor incomes of the young in one age cohort relative to incomes of retired persons can be an occasion for automatically lowering contributions and raising benefits. A rise in life expectancy, with incomes unchanged, would be an occasion for automatically raising contributions and lowering benefits.

Ultimately, with new information technology, the oversimplified distinction we now have between health insurance, disability insurance, and old-age insurance is no longer needed. Indeed, old age is just a time of accelerating health and disability risk. The system can be made not contingent on age itself, but on parameters reflecting a variety of individual parameters that reflect individual risk outcomes.

² Benartzi and Thaler (2003) have shown an example. Their "Save More Tomorrow" plan to boost national saving has as its defining elements that people are offered an opportunity to commit themselves now to decide to save more at a future date, and they set up a structure to ensure that the extra saving is withheld from their paychecks if they do not retract their order.

REFERENCES

- Ameriks, John; Caplin, Andrew and Leahy, John.** "Wealth Accumulation and the Propensity to Plan." National Bureau of Economic Research (Cambridge, MA) Working Paper No. w8920, May 2002.
- Athanasoulis, Stefano and Shiller, Robert J.** "World Income Components: Measuring and Exploiting Risk Sharing Opportunities." *American Economic Review*, September 2001, 91(4), pp. 1031–54.
- Barsky, Robert F.; Juster, Thomas; Kimball, Miles S. and Shapiro, Matthew D.** "Preference Parameters and Behavioral Heterogeneity: An Experimental Approach in the Health and Retirement Study." *Quarterly Journal of Economics*, May 1997, 112(2), pp. 537–79.
- Behm, G.** "Über Alters- und Invalidencassen für Arbeiter." *Schriften des Vereins für Sozialpolitik*, 1874, 5, pp. 131–76.
- Benartzi, Shlomo and Thaler, Richard.** "Naïve Diversification Strategies in Retirement Savings Accounts." *American Economic Review*, September 2001, 91(4), pp. 79–98.
- _____. "Save More Tomorrow: An Easy Way to Increase Employee Saving." *Journal of Political Economy*, 2003 (forthcoming).
- Burtless, Gary.** "What Do We Know about the Risk, of Individual Account Pensions? Evidence from Industrial Countries." *American Economic Review*, May 2003 (*Papers and Proceedings*), 93(2), pp. 354–59.
- Shiller, Robert J.** *Macro markets: Creating institutions for managing society's largest economic risks*. Oxford, U.K.: Oxford University Press, 1993.
- _____. "Social Security and Intergenerational, Intragenerational and International Risk Sharing." *Carnegie-Rochester Series in Public Policy*, June 1999, 50(99), pp. 165–204.
- _____. *The new financial order: Risk in the 21st century*. Princeton, NJ: Princeton University Press, 2003.
- Siegel, Jeremy J.** *Stocks for the long run*, 3rd Ed. New York: McGraw-Hill, 2002.