On the Contribution of Economics to the Evaluation and Formation of Social Insurance Policy

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If one had to choose a single policy that best characterizes the postwar behavior of governments, it might well be their expansion of social insurance. Today's citizen of a typical developed country is insured through government programs against unemployment, disability, medical expenses, impoverishment in youth and middle age (through welfare systems), impoverishment in old age (through old-age pensions), loss of spousal support due to divorce (through Social Security dependent benefits), fluctuating earnings (through progressive tax systems), early death of a spouse (via survivor's insurance), and late death (via annuity insurance). The remarkable growth of social insurance has occurred against a backdrop of increased geographic mobility, dramatic changes in demographics, and, at least in the United States, a dissolution of the family. The extent to which social insurance has been the cause of family decline and demographic change or its result is one of many complex questions that economics or any other social science is unlikely to ever fully answer. Economic analysis, while not being able to discover the precise recipe leading to our social insurance institutions, has, at least, been able to taste many of the key ingredients. Economics has and can provide real insight into a) the need for social insurance programs, b) the appropriate size of such programs, and c) how social insurance programs affect the economy.

This paper seeks to illustrate each of these three kinds of economic contributions to the evaluation and formation of social insurance policy. Section I (drawing on my 1987 article) presents an efficiency argument for compulsory saving through a progressive Social Security system. Section II (drawing on my paper with Avia Spivak and Laurence Summers, 1982, and on Alan Auerbach's and my 1987b paper) illustrates an analysis of the appropriate size of social insurance programs, examining in turn the questions of whether households save enough and buy enough life insurance or whether more government intervention in these matters is appropriate. Section III (drawing on my 1989 book) illustrates how social insurance programs can affect the economy by discussing potential savings effects of health insurance, particularly an asset-tested Medicaid scheme. Section IV concludes the paper with suggestions for future research and policy options. As indicated, the paper draws on my own and coauthored research, and it provides only limited references for no better reason than easing my task and saving space. In so doing I do not pretend to suggest that this is more than a very small subset of a huge volume of research sparked in the 1970s, in large part, by Martin Feldstein.

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I. An Efficiency Argument for Compulsory Saving

Forced saving through Social Security systems is virtually a universal characteristic of social insurance systems. Why? Paternalism is one answer; governments may fear that their constituents are too myopic to save adequately on their own and need to be forced to save. As Section II indicates, there is some empirical basis for this concern. Another reason studied involves "The Samaritan's Dilemma." The dilemma is that altruists may find themselves manipulated by the objects of their affection. In the saving context, potential recipients of transfers may save too little because they can count on help from their altruist.

The Samaritan's Dilemma suggests that some people might undersave, but does it

support a view that most people, even the altruists themselves, might undersave? The answer is yes. Suppose each person in society is altruistic and cares about the welfare of all other individuals. While each individual may be altruistic towards everyone else, those who fare better economically will end up transferring resources to those who fare poorly. Since each individual can anticipate such transfers in the event of bad luck, each individual will have an incentive to free ride on the generosity of others in considering how much to save.

To illustrate this point consider a very simple economy consisting of persons A and B, both of whom live and consume for two periods and are altruistic towards each other in their second period. Suppose each earns 1 in the first period. In the second period with probability $1/2$, A earns 1 and B earns 0, and with probability $1/2$, A earns 0 and B earns 1. Denote by a caret the second-period state in which A earns 1 and B earns 0, and denote by an asterisk the second-period state in which A earns 0 and B earns 1. Also assume a zero interest rate. Then, assuming logarithmic utility, the expected utility of A can be written as

$$EU_y^A = \log C_y^A + 1/2\left[\log \hat{C}_o^A + m \log \hat{C}_o^B\right] + 1/2\left[\log \overset{*}{C}{}_o^A + m \log \overset{*}{C}{}_o^B\right]$$

where C_y stands for consumption when young, C_o stands for consumption when old, and m is a parameter whose value lies between 0 and 1, and indicates the extent of altruistic caring by A for B and by B for A. An exactly analogous expression can be written for the expected utility of B.

In state $\hat{}$, A is relatively well off and transfers to B, while the opposite occurs in state *. In state $\hat{}$, A determines the consumption of the two at the margin; letting $\hat{R}$ stand for the combined resources of A and B in state $\hat{}$, A will choose to consume $[1/(1+m)]\hat{R}$ and will transfer his remaining money to B who will consume $[m/(1+m)]\hat{R}$. As can easily be verified, in state $\hat{}$, B would prefer to reverse the fractions of $\hat{R}$ that he and A consume. But since B has less money in state $\hat{}$, he cannot enforce his desire to consume a larger fraction of the combined resources of A and B. On the other hand, A is in a position to enforce his desired allocation of $\hat{R}$; since his own second-period resources exceed $[1/(1+m)]\hat{R}$, he transfers the excess to B who is eager to receive the transfer and, indeed, would like to receive more.

Thus in state $\hat{}$, B understands that he will not control at the margin the allocation of total resources, and every additional dollar saved by B when young will mean only $m/(1+m)$ dollars more of his own consumption in state $\hat{}$; that is, if B saves another dollar, in state $\hat{}$, A will cut back his transfers by $\$1/(1+m)$, leaving B with only $\$m/(1+m)$ of additional consumption. Of course, exactly the opposite situation arises in state *. Hence, in the first period when thinking about how much to save, both A and B will realize that another dollar of savings will not deliver, in their respective adverse states, as much benefit as would be the case were they in control of the marginal allocation of consumption. As a consequence both A and B will have a smaller saving incentive when young.

It is easy to show that without government intervention, C_y for both A and B will equal $3/(3+m)$, while the Pareto-efficient level of consumption when young is smaller, namely $3/(4+2m)$. If m equals $1/3$, the efficient level of consumption is 28 percent smaller than the inefficient level, and the efficient level of saving is 3.6 times the inefficient level.

In a world of initially identical self-serving altruists, individuals, knowing that they will be vulnerable to pleas for assistance in the future, will favor a government program that encourages saving. But would they favor a compulsory saving system that actually takes resources from each individual and saves them for the future? To see why compulsory saving may be more efficient than subsidization in increasing saving, consider an extension of the simple model to include uncertain second-period earnings in the adverse state. In state $\hat{}$, which still occurs with probability $1/2$, A still earns 1, but B earns 0 with probability $1/2$ and .5 with probability

1/2. In state *, B still earns 1, but A earns 0 with probability 1/2 and .5 with probability 1/2. If m is not too small, A will still transfer to B in state ^, and B will transfer to A in state *. Assume now that B's earnings in state ^ are not observed by A, and vice versa in state *. Then in state ^, B will have an incentive to misstate his earnings as 0 when they are actually .5. Similarly, A will misstate nonzero earnings in state *. As a consequence, A in state ^ and B in state * face uncertainty about the resources of each other, and make their transfer subject to this uncertainty.

In state ^, A's second-period level of expected utility is given by

$$\hat{V}_A = \max_{\hat{C}_o^A} E\hat{U}_o^A\left(\hat{C}_o^A\right)$$

$$= \max_{\hat{C}_o^A} \log \hat{C}_o^A + mE \log \hat{C}_o^B$$

subject to

$$\hat{C}_o^A + \hat{C}_o^B = 1 + 2S + W^B,$$

where $2S$ is combined first-period saving $2(1 - C_y)$ of A and B, and W^B is B's random second-period earnings in state ^. Denote the optimal choice of $\hat{C}_o^A$ and $\bar{C}_o^A$, and note that

$$\hat{V}_A = \max_{\hat{C}_o^A} E\hat{U}_o^A\left(\hat{C}_o^A\right) = E\hat{U}_o^A\left(\bar{C}_o^A\right)$$

$$\leq E \max_{\hat{C}_o^A} \hat{U}^A\left(\hat{C}_o^A\right)$$

Hence, for any choice of C_y and, therefore, S, A's expected utility in the second period in state ^ is larger if B's second-period earnings are revealed prior to A's choice of $\hat{C}_o^A$. It is also the case that both A and B could be better off if B's second-period state ^ earnings were public knowledge. To see this, suppose that B's earnings are revealed, but that A is forced to consume $\hat{C}_o^A$ when B's earnings are .5. When B's earnings are zero, A is free to choose $\hat{C}_o^A$. In this case, $\hat{C}_o^A$ will be less than $\bar{C}_o$, making both A and B better off. Hence, under this scenario when B's earnings are 1, A and B are in the same situation as in the case that B's earnings are not observed, while both are better off when B's earnings are zero. Thus we see that observability of B's earnings can provide a Pareto improvement over the situation of nonobservability.

If all saving of A and B is compulsory and done through Social Security, then Social Security faces no problem of observation. Hence, Social Security can resolve both the problems of deficient first-period saving and nonobservability of second-period earnings. To Pareto improve the allocation, Social Security must, however, be able to link benefit payments to earnings. This is readily accomplished if Social Security provides benefits on a progressive basis. In this case, in state ^, B receives positive transfers (via Social Security) from A, but the extent of these transfers declines with the level of B's state ^ earnings, which is exactly what would occur without Social Security if A could observe B's earnings.

II. What is the Appropriate Level of Social Insurance?

Much of the contribution of economics to formulating social insurance policy probably lies in assisting policymakers in posing and separating their questions. The issue of the adequacy of the income of the elderly is a case in point. One approach to this issue involves asking whether the elderly are sufficiently well off compared to younger generations. Another approach is to ask whether the elderly are well off in comparison to their own youth and middle age. Both questions need to be asked, but a negative answer to the first would suggest a quite different policy response than a negative answer to the second. If the elderly are worse off than younger generations because of a particular event, such as the Great Depression, or because of rapid productivity growth, there may be a case for an intergenerational transfer to the elderly. Such a transfer could take many forms, such as increasing income tax exemptions for people above age 65, but it does not require setting up a compulsory saving system. In contrast, if the elderly are

worse off than the current young, not because their earnings were lower in youth, but because they squandered their earnings and failed to save, the remedy might involve a compulsory saving system.

Answering the first question requires comparing the lifetime resources of different generations; answering the second requires comparing consumption when young with consumption when old for a given level of lifetime resources. My article with Spivak and Summers (1982) attempts the latter comparison using the *Retirement History Survey* (*RHS*). Our procedure involved estimating from the copious retrospective data the lifetime resources of elderly couples when the head was age 30 as well as at the time of the *Survey*. We then calculated the constant consumption stream that could have been financed as of age 30 with age 30 resources and the constant consumption stream that could be financed at the time of the interview. We found that fewer than 7 percent of elderly couples in 1969 had ratios of old-age to lifetime (age 30) affordable consumption streams below .8. These data square with the findings of Peter Diamond (1977) and others that a significant minority of the elderly have zero or quite small amounts of net wealth. Despite this fact, the Social Security benefits, private pensions, and labor earnings for these elderly were sufficient to finance a level of old-age consumption as large or larger than they enjoyed as younger adults.

These data suggest no prima facia case that there is significant undersaving by American households. The analysis rests, however, on the assumption that the sampled couples predicted correctly their future Social Security benefits. To examine this assumption, Spivak, Summers, and I used the data to ask what would the old-age to lifetime-consumption ratios have looked like had there been no Social Security program, and had the sampled couples consumed all of the Social Security taxes at the time they would otherwise have been collected. This assumption leads to a significant change in the distribution of consumption ratios; now almost 40 percent of the couples have consumption ratios less than .8. These numbers indicate the need to pin down the saving response to Social Security if one is to use these data to assess the adequacy of saving. We presented a regression to pin down the saving response to Social Security. Our analysis suggests that, absent Social Security, the ratio of affordable old-age consumption to affordable lifetime consumption would be substantially lower for a large fraction of households. Although they are subject to several sources of bias, these results suggest a potential problem of inadequate savings in the absence of government intervention.

The adequacy of insurance is a related question that can shed light on the extent of consumer rationality with respect to planning for the future. Auerbach and I (1987b) examined the adequacy of life insurance of *RHS* couples using a methodology similar to that just discussed. We compared the equal and time invariant (constant) consumption stream that could be guaranteed for each spouse, given the couple's combined resources and the appropriate purchase of life insurance, with the constant consumption streams that could be afforded in the event of the death of either of the two spouses, given their actual holdings of life insurance. Thus a couple that has no life insurance and has virtually all its resources tied up in the husband's future earnings will have a very low ratio of the hypothetical widow's affordable consumption stream to the insurable consumption stream that could be secured with the proper purchase of life insurance.

The 1969 *RHS* is also used in the analysis. Auerbach and I reported that, for a quarter of the entire sample, the ratio of hypothetical widows' insurable consumption to the insurable level of consumption is less than .75. We also focused on that subset of couples where the wife is "at risk." At risk refers to cases in which over half of the couples' combined present expected value of resources is tied up in income streams that are contingent on the husband's survival. For this group, over 45 percent of hypothetical widows have consumption ratios below .75; over 13 percent have a ratio below .5. Auerbach and I concluded from these tables and from consideration of potential biases, most of which tend to overstate the adequacy of

insurance, that a significant minority of elderly couples appear to have inadequate amounts of life insurance. Indeed, our analysis and related studies by Karen Holden et al. (1986) and others suggest that inadequate purchase of life insurance may be an important explanation of poverty among elderly widows. Auerbach and I also found, in our estimation of life insurance demand equations, that the actual purchase of life insurance differs greatly from that predicted by the theory. In particular, we found no evidence whatsoever that couples adjust their private life insurance purchase to offset Social Security's provision of survivor insurance. Our analysis provides a strong case for increasing the share of survivor benefits in the mix of total Social Security benefits.

III. Government-Provided Health Insurance and Precautionary Savings

The third example of economic research on social insurance considers how social insurance can affect aggregate savings. Thanks to Feldstein's 1974 seminal article, we know that the manner in which social insurance programs are financed can have major savings implications. Recently researchers concerned with the interaction of savings and social insurance have shifted their focus to the risk-sharing properties of social insurance. The issue of concern is the extent to which social insurance reduces precautionary savings. Precautionary savings appears to represent a major motive for saving. Studies by myself and Spivak (1981), James Davies (1981), Andrew Abel (1983), Zvi Eckstein et al. (1983), and my paper with Spivak and Shoven (1986) have shown the importance of precautionary savings in response to life span uncertainty and made the point that Social Security's annuity insurance can greatly reduce national savings. Other research has suggested the importance of the progressive tax structure in pooling earnings risk and reducing aggregate savings.

Another form of precautionary savings is savings in response to uncertain health expenditures. One way to analyze this form of precautionary savings is to construct a simulation model and determine how different insurance institutions alter the amount of savings. Table 1 reports results on a 55-period lifecycle simulation model in which individuals between ages 20 and 55 have a constant annual probability of becoming ill. The model has a simple structure: inelastic labor supply, a CES time-separable utility function, no demographic structure, and no uncertainty except for health status. The solution to the model is simplified by taking the wage and interest rates as exogenous, but it is complicated by the need to engage (by computer) in numerical dynamic programming.

TABLE 1—AGGREGATE SAVINGS UNDER DIFFERENT HEALTH EXPENDITURE REGIMES

Regime	Base Case[a]	Lower Cure Costs[b]	Lower Illness Probability[c]
Self-Payment	1,008,670	869,710	1,136,140
Fair Insurance	891,521	828,212	822,061
Live with It	527,017	527,017	682,301
Medicaid	222,062	325,871	626,383

[a]Cure costs equal 5 times annual earnings, and annual illness probability equals .05.
[b]Lower cure costs = 2.5 × annual earnings.
[c]Lower illness probability = .01.

The model assumes that agents face the risk of an illness for which there is a cure. If an agent becomes ill and has the cure, he will not become ill again. The cost of the cure for the illness is parametrized as a multiple of annual earnings. The table considers four different situations. The first case is "Self-Payment." In this economy there is no health insurance, and individuals self-insure. In the second case, actuarially fair health insurance is available. In the third case, individuals chose (because of a preference parameter) to live with the sickness if they become ill rather than take the cure. And in the fourth case, there is no insurance, but there is a Medicaid program which has a 100 percent asset tax on its recipients.

The first column assumes that the probability of the illness is 5 percent per year starting after age 20, and the cost of the cure is five times annual earnings. The second column involves a cost of the cure equal to two and one-half year's earnings. And the third lowers the annual probability of the illness from 5 percent to 1 percent.

A comparison of the Live with It regime and the Self-Payment regimes indicates the

potential importance of precautionary savings. In the Live with It regime, there is no uncertainty about future health expenditures since when people become ill, they simply live with the ailment, rather than have the cure. The Fair Insurance regime has much less savings than the Self-Payment regime reflecting the reduction in precautionary saving when insurance is available. Savings in the Fair Insurance regime exceeds savings in the Live with It regime because, even though agents are insured, there is a steepening of the age-consumption profile in the Fair Insurance regime relative to the Live with It regime reflecting the consumption health expenditures on the cure in old age. And the increased savings of young agents explains the increase in savings in Fair Insurance relative to Live with It.

Savings in the Medicaid regime is remarkably small. In the Base Case, aggregate savings with a Medicaid system is only a quarter of what it is under Fair Insurance. In the case of a 1 percent illness probability, savings in the Medicaid regime is 25 percent less than savings with Fair Insurance. The prospect of having all one's assets confiscated by a Medicaid system is clearly a major saving disincentive. The simulation model, while admittedly stylized, indicates that what might seem to be minor features of the design of a social insurance institution may have major affects on the macro economy. One should not, of course, conclude from this particular analysis that government insurance provision per se might be welfare reducing in the long run. This is certainly not the case. Rather, one should conclude that the welfare-improving provision of insurance by the government (in cases where private insurance is unavailable) may have deleterious savings implications that need to be offset by additional government policies.

IV. Conclusions and Suggestions for Research and Policy

In my view, economic analysis has a very important role to play in the formation of social insurance policy. Analyses of the kind described here can tell us whether social insurance is desirable, how the programs should be structured, how large the programs should be, and what will be the feedbacks to the macro economy. Research over the past fifteen years has focused primarily on documenting the growth and macro effects of social insurance. The lessons here are now fairly well known to economists but need to be better taught to the decision makers. The so-called "Social Security surpluses" in the 1990s is a good example of a combined macro-social insurance issue that economists need to clarify to decision makers before they once again use the veil of a "balanced budget" to dramatically loosen fiscal policy.

Not surprisingly, the infant industry that is social insurance research dealt first with the big picture and is turning increasingly to the question of how these programs should be structured. Health economists are actively analyzing different cost reimbursement schemes for Medicare. Welfare economists are considering how that system's implicit negative income tax schedule should be altered (via programs like work fare) to reduce labor supply disincentives confronting the poor. Labor economists are studying whether Social Security's earnings test should be eliminated.

The earnings test represents just one of many features of the U.S. Social Security System that badly requires overhauling. The fact that the general scale of Social Security is not likely to change and that the treatment of the current elderly is politically taboo does not preclude the consideration of changes in the system for Americans currently under, say, 45. The current structure is both inequitable and potentially very inefficient (see Boskin, myself, and Shoven, 1988; Auerbach and myself, 1987a). To many young Americans, Social Security seems like a raw deal. And no wonder. They and their employers pay in almost 15 percent of their wages; they receive no statement promising any future benefit; they have no idea what the level of their benefits will be nor how they are calculated; and they worry that the system will be bust when it is their turn to collect. One wonders whether insecurity rather than security is being delivered by a program with these characteristics. My guess is that fundamental restructuring of Social

Security will emerge as a major issue for the baby-boom generation. If so, economic analysis will play an important part in the debate.

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