
Moral Hazard as a Market Failure in the Private Provision of Social Insurance

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Introduction

Demographic changes, specifically the large population of baby boomers reaching retirement age, has led to worries that the current Social Security System will be unable to support the resulting future financial obligations. Solutions to this problem range from minor changes in the current system to a possible cessation of social security. Some small changes, such as increasing the retirement age or raising the payroll tax, can cause dramatic improvements. Increasing the retirement age, for example, raises revenue going into the system by increasing the amount of time individuals pay into the system. That change consequently leads to a potential reduction in payouts because individuals also spend less time receiving social security. Increasing the payroll tax also increases revenue because each individual contributes a higher percentage of income to social security. Payouts, however, do not increase as the payroll tax increases; this disparity makes taxpayers less willing to use this method as a solution to the crisis.

Alternatively, privatization would involve individuals holding and having control over private retirement accounts. One main selling point of privatization is that it respects individual choice

and risk preferences. While the privatization of social security remains highly debated on economic and social grounds, my research focuses on the moral hazard that arises under the private provision of social security.

Moral hazard is an information asymmetry in which the presence of insurance induces the insured to reduce preventative activity that would otherwise directly lower the probability of a loss. A classic example of moral hazard entails bicycle insurance. Suppose an individual owns a bicycle. The individual can take certain, although costly, actions to prevent the bicycle from being stolen—buying a lock or parking in a safe area. All of the activities are costly, but they lower the probability that the bicycle will be stolen. With full insurance—meaning that if the bicycle is stolen, a new one is provided—the individual has less incentive to take the preventative actions. If the bicycle is stolen, the individual faces no direct costs apart from the hassle of replacement. The reduction in preventative activities leads to an increase in the likelihood that the bicycle will be stolen.

Economists and politicians fear that individuals will not adequately save for retirement if the government no longer provides social security. The fear arises from the moral hazard problem that occurs when individuals believe that the government will bail them out if they reach retirement penniless. The perceived bailout acts as full insurance against an individual's savings, reduces participation in preventative activities, and ultimately increases the likelihood that the individual will reach retirement without adequate savings. It is important to research what factors increase or decrease moral hazard so that policy decreasing the costs associated with excessive risk taking can be introduced.

In this investigation, I use the theoretical device of viewing privatized social security as a financial institution in which individuals must monitor behavior. This view moves the analysis of moral hazard into the realm of deposit insurance, but the analytical shift is a natural and needed one. First, there is little literature on moral hazard and private social insurance; by viewing social security this way, one can utilize the robust deposit insurance literature. Also, the moral hazard problem that occurs in deposit insurance is remarkably similar to that present within a privatized social security system. Currently, when depositors put money into the bank, up to \$100,000 is fully insured. This explicit deposit insurance was introduced in order to prevent bank runs and to protect depositors against losses associated with bank fragility. With the current system, however, money put in the bank is fully insured, meaning the depositor's money is guaranteed no matter what happens. The depositor faces a disincentive to monitor the bank closely to ensure that deposits are safe. This parallels social security with the implied government bailout playing the role of deposit insurance and individual private account holders acting as depositors. Consequently, individual account holders also face the disincentive to monitor the privatized social security system to insure that their savings are safe.

This research uses a safety net management model found in deposit insurance literature as a foundation for further research into a privatized social security system and the ensuing issues with moral hazard. In the model, the expected present value of safety net costs and benefits are modeled as a function of spending on crisis prevention and crisis management. This compares well to a privatized social security system with the implied government

bailout acting as the safety net. I will show that by introducing healthy externalities to the model, moral hazard decreases.

Literature Review

To date, there has been much controversy over the potential social security crisis. In 1996, Mitchell and Zeldes [2] offered a much needed framework for analysis, measuring the costs and benefits associated with the possible shift to a privatized social security system. They argued that the benefits of such a move would include less political involvement in retirement savings, as well as an increase in individual choice. On the other hand, they identified several disadvantages, including a decrease in national risk sharing, an increase in administrative costs, as well as some distributional problems. This paper addresses the information problem that has been a concern of most previous research regarding social security—and adverse selection. The information problem is due to the fact that the social security system does not have perfect information about an individual's life expectancy. The main worry, therefore, is that only individuals who think they will live a long time, longer than the average which determines the insurance premium, will opt for a privatized social security system because they are the ones that stand to benefit the most. Little research has been done on the information problem of moral hazard in a privatized social security system.

The goal of this research is to address this issue, but the search for literature on moral hazard had to be redirected. The deposit insurance literature offered the variety of comprehensive analyses needed for this research. Edward Kane, a leading authority on deposit insurance, has evaluated programs around the world. His

article, "Using Disaster Planning to Optimize Expenditures on Financial Safety Nets," [1] offered a benchmark model for safety net management. Specifically, he looked at individual monitoring and the indirect costs associated with moral hazard. He went on to show that around the globe, organizations tend to underinvest in crisis management and overinvest in crisis prevention. This occurs because governments are reluctant to acknowledge the moral hazard problem that arises with spending on crisis prevention as well as weaknesses present in the handling of a crisis. Although Kane's work was a benchmark for safety-net management, his model can be used to explore other moral hazard issues.

Methodology

When modeling social security in the context of deposit insurance, it is important to take note of several things. First, deposit insurance is an explicit system in which individuals deposit money into banks with the assurance that their money is protected. When individuals place money into a privatized social security system, it is assumed that the government will not allow individuals to fall below a certain level of poverty regardless of poor or risky investments. Such a situation illustrates the government bailout. It is also assumed that the government bailout, though implicit, is strong enough to be treated as explicit. The moral hazard problem that arises with deposit insurance occurs because, in the event of a crisis, individuals face no direct costs. Instead, their money is insured, and their incentive to monitor the financial institution decreases drastically, creating an opportunity for banks to take on excessive risk. Similar outcomes would occur with a privatized social security system. Individuals invest money into

the privatized social security system, which acts like the bank in the deposit insurance situation. It is assumed that an one's incentive to monitor the quality of investments is directly related to the costs one will face in the event of a crisis. As costs rise, so does the incentive to monitor.

When individuals reduce their monitoring, the system takes on excessive risk. Thus, as individuals monitor less, and the system takes on more risk, the probability of a crisis increases. A safety net management model found in the deposit insurance literature provides a valuable tool to analyze costs and benefits, and, particularly, explore how they relate to moral hazard and individual monitoring. Analysis using the model shows that spending on crisis prevention and health externalities will increase moral hazard, while spending on crisis management will decrease it.

Model

The model used here is based on Kane's safety net management model. The present value of the safety net, V_N , is determined by the net benefits, N_K (Benefits–Costs), discounted at an interest rate, r , over horizon T .

$$V_N = \sum_{k=0}^T \frac{N_K}{(1+r)^k} \quad (1)$$

The direct costs associated with safety net management involve the expenditures on crisis prevention, C_p , and crisis management, C_M . Expenditures on crisis prevention will likely include spending on regulation aimed at making sure the system does not take on excessive risk. Spending on crisis management involves planning and executing a baseline response to a failed system. Modifying

the model to include health externalities as an additional cost is reasonable because if a crisis occurs, those receiving social security will not only be poor, but their health will suffer. The impacts of these extra health costs will lie on the government and, ultimately, on taxpayers. Therefore, the model includes health costs, C_H , if a crisis occurs.

Individuals must monitor the system to insure that it does not take on excessive risk. Spending on prevention, management, and the reduction of health externalities, however, will alter an individual's decision to monitor. The incentive to decrease monitoring is the moral hazard in the model. Indirect costs associated with safety net management are the benefits indirectly surrendered, B_{IM}^k , because of this moral hazard. That is, when moral hazard exists, the equilibrium is sub-optimal, resulting in fewer benefits to agents, and this term captures the costs of the sub-optimality.

Benefits associated with safety net management are the direct benefits B^k , associated with the expenditures on crisis prevention, crisis management, and health externalities. Additionally, because expenditures replace some individual monitoring, there is an additional term, C_{IM}^k , representing the amount of individual monitoring the system displaces.

The present value of the safety net is now expanded to reflect both the direct and indirect costs and benefits, still discounted with interest rate r , over horizon T .

$$V_N = \sum_{k=0}^T (1+r)^{-k} \left[B^k(C_P, C_M, C_H) + C_{IM}^k - B^k(C_{IM}^k) - (C_P + C_M + C_H) \right] \quad (2)$$

Kane's model assumes individual monitoring, C_{IM}^k , depends upon the effects of different kinds of supervisory activity. Following that approach, benefits, B^k , are a function of C_p , C_M , and C_H . Direct benefits to the system increase with all spending, including spending on reducing health externalities. Costs resulting from the benefits indirectly surrendered due to moral hazard, B_{IM}^k , are a function of the amount of monitoring the system displaces, C_{IM}^k . As the system displaces monitoring, benefits associated with individual monitoring decrease.

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$$C_{IM}^k = C_{IM}^k(C_p, C_M, C_H) \quad (3)$$

It is important to uncover how the function C_{IM}^k works. Again, C_{IM}^k represents the amount of monitoring the system displaces; individual monitoring decreases as C_{IM}^k increases. Displaced monitoring is a function of spending on prevention, management, and health externalities. First, spending on crisis prevention involves spending on gathering, analyzing, and reacting to information regarding changes in the system. That spending directly displaces the costs individuals face to do the same thing. Therefore as C_p increases, C_{IM}^k increases as well. Second, spending on crisis management involves spending on shutting down an insolvent system. According to Kane, individual monitoring increases with spending on crisis management; that assumption is adopted here as well. Third, spending on health externalities should decrease individual monitoring. Spending lessens the health costs individuals face, thus decreasing total costs to individuals during a crisis. The lower the costs an individual faces, the less incentive there is to monitor.

Therefore as spending on C_H increases, monitoring decreases and C_{IM}^k increases.

Assuming second order conditions are met, safety net managers act to optimize spending on each activity they control: C_P , C_M , and C_H . The model assumes that managers are fully informed. Therefore, to maximize the net present value of the safety net, which is the policy

goal, managers should spend until $\frac{\partial V_N}{\partial C_P}$, $\frac{\partial V_N}{\partial C_M}$, and $\frac{\partial V_N}{\partial C_H}$ are all equal to zero.

$$\frac{\partial V_N}{\partial C_P} = \sum_{k=0}^T (1+r)^{-k} \left[\frac{\partial B^k}{\partial C_P} + \left(1 - \frac{\partial B_{IM}^k}{\partial C_{IM}^k} \right) \left(\frac{\partial C_{IM}^k}{\partial C_P} - 1 \right) \right] \quad (4)$$

$$\frac{\partial V_N}{\partial C_M} = \sum_{k=0}^T (1+r)^{-k} \left[\frac{\partial B^k}{\partial C_M} + \left(1 - \frac{\partial B_{IM}^k}{\partial C_{IM}^k} \right) \left(\frac{\partial C_{IM}^k}{\partial C_M} - 1 \right) \right] \quad (5)$$

$$\frac{\partial V_N}{\partial C_H} = \sum_{k=0}^T (1+r)^{-k} \left[\frac{\partial B^k}{\partial C_H} + \left(1 - \frac{\partial B_{IM}^k}{\partial C_{IM}^k} \right) \left(\frac{\partial C_{IM}^k}{\partial C_H} - 1 \right) \right] \quad (6)$$

Solutions to the equations give the optimal values.

Results

Using the methodology introduced in the section above, the results from equations (4), (5), and (6) are analyzed to find the effects of adding the health externality to Kane's model. Specifically, this

analysis shows that adding health externalities to the proposed privatized social security system decreases the overall moral hazard problem.

Analysis

Equations (4), (5), and (6) separate costs and benefits into direct and indirect components. The direct components are the terms $\frac{\partial B^k}{\partial C_P}$, $\frac{\partial B^k}{\partial C_M}$, and $\frac{\partial B^k}{\partial C_H}$. These terms are all positive because the model assumes that spending on prevention, management, and health costs provide positive net benefits. Introducing a new element into the model, health externalities, and adding health related costs bring a new set of costs that an individual will face in the event of a crisis. Therefore, the overall costs associated with a crisis will increase. Those higher costs increase an individual's incentive to monitor, thus lowering moral hazard. Spending on health costs, however, lowers the cost that an individual will face in the event of a crisis, much like spending on crisis prevention and crisis management. This follows Kane's conclusion that the net direct benefits of spending on crisis prevention, crisis management, and health costs is positive, disregarding moral hazard.

The indirect components, those involving B_{IM}^k , or C_{IM}^k , capture the moral hazard associated with spending. Assuming that $1 - \left(\frac{\partial B_{IM}^k}{\partial C_{IM}^k} \right)$ is negative, it is possible to evaluate the indirect net marginal benefits of government spending on crisis prevention. Spending on crisis prevention directly displaces the costs individuals face to do the same thing, $\left(\frac{\partial C_{IM}^k}{\partial C_P} \right) > 0$, equation (3).

Therefore, from equation (4) Kane argues that the indirect net marginal benefits of spending on crisis prevention are negative. This follows from the fact that spending on crisis prevention decreases individual monitoring, increases the amount of monitoring the safety net displaces, and lowers the indirect benefits of individual monitoring. Following the same logic, Kane finds that indirect net marginal benefits of government expenditures on crisis management are positive.

It is important to look at the effect of adding health externalities to the mix. Equation (6) captures the marginal direct and indirect effects of spending on health costs. Keeping in mind that the net marginal direct benefits are positive, as with all spending, it is interesting to see what effects these health costs have on moral hazard. To see this, look at the indirect components. From equation (3), one can see that spending on health costs increases C_{IM}^k . This result occurs because spending on health costs decreases the costs an individual will face in the event of a crisis. The lowered costs decrease an individual's incentive to monitor, thus increasing C_{IM}^k . Following Kane's logic regarding spending on crisis prevention, the net indirect marginal benefit of spending on health costs is negative.

In conclusion, the net direct marginal benefits of all types of spending are positive. The net indirect marginal benefits of spending on crisis management are positive as well. The net indirect marginal benefits of spending on crisis prevention and health costs, however, are negative due to the moral hazard problems. Overall, the total effect of adding health externalities depends on a number of factors. First, adding health externalities increases the total costs an individual faces upon a crisis. Higher costs lead

to a higher incentive to monitor, decreasing moral hazard. Then, by introducing spending aimed at lowering these costs during a crisis, C_H , one can see that the net indirect marginal benefits of such spending are negative. Health related costs in a crisis are lowered with spending on C_H , which decreases an individual's incentive to monitor and increases moral hazard. Overall, health externalities decrease moral hazard, but the magnitude depends on the indirect effects of spending on health costs, C_H .

Discussion

The evidence in the sections above shows that the introduction of health externalities decreases moral hazard overall, but the extent of the decrease depends on spending to reduce health costs and the indirect effect that spending has on moral hazard. It is clear through the analysis of the model that spending on crisis prevention and health costs actually increases moral hazard.

Any policy aimed at reducing moral hazard under privatized social security must consider two things. First, if the goal is to reduce moral hazard, the model presented in this paper suggests that it is necessary to increase the cost that an individual will face in the event of a crisis. For example, a policy mandating that an individual must cover all expenses in the event of a crisis will induce the individual to monitor the system extensively, decreasing most of the moral hazard problem. In contrast, if a policy is implemented covering all costs an individual faces during a crisis, the individual will cease to monitor.

Second, and equally important, a policy must look at the direct costs an individual faces in a crisis. When individuals reach retirement, they no longer have the ability to generate income. If the

goal is to decrease moral hazard by increasing the costs an individual faces, an individual's age and ability to generate income need to be considered. The main goal of the social security program is to make sure there is not an elderly population in poverty. Although originally intended to be part of a three-legged support system, social security is often the primary source of income for those over the age of sixty-five. Therefore, increasing the costs individuals face in a crisis under the guise of decreasing moral hazard may actually lead to less desirable results.

In future research, I wish to examine possible policy recommendations aimed at decreasing the moral hazard problem under privatized social security, without generating excessive costs for those who can no longer generate income. A possible suggestion would be a deductible plan often found in health care and care insurance. Under such a plan, individuals would cover a certain percentage of the costs that occur in a crisis. If individuals collectively do not monitor the system, then they will end up having to cover some proportion of the costs associated with a crisis. The optimal level of costs should be high enough to leave an individual uncomfortable in the event of a crisis, enough so that they will be induced to monitor the system.

References

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