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Unemployment insurance with hidden savings

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Abstract

This paper studies the design of unemployment insurance when neither the searching effort nor the savings of an unemployed agent can be monitored. If the principal could monitor the savings, the optimal policy would leave the agent savings-constrained. With a constant absolute risk-aversion (CARA) utility function, we obtain a closed form solution of the optimal contract. Under the optimal contract, the agent is neither saving nor borrowing constrained. Counter-intuitively, his consumption declines faster than implied by Hopenhayn and Nicolini (1997) [1]. The efficient allocation can be implemented by an increasing benefit during unemployment and a constant tax during employment.

JEL classification: D82; D86; J65

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1. Introduction

Unemployment insurance must balance the benefits of insurance against the concern that an over-generous program will discourage search effort. Card, Chetty and Weber [2] provide evidence that search effort varies according to an agent's financial situation. They find that exogenously richer agents take longer to find a job but do not find higher wages on their next job. In other words, it seems that wealth is one important determinant in the search effort decision.

Since neither search effort nor wealth are readily observable to the planner, it is natural to wonder how these information frictions might affect the optimal unemployment system. We in-

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troduce hidden savings into an environment similar to the Hopenhayn and Nicolini [1] version of the model of Shavell and Weiss [3]. We show that the addition of hidden savings leads to faster consumption declines during an unemployment spell than the declines in a model with observable savings. Moreover, with hidden savings, agents with relatively high initial insurance claims have the fastest rate of consumption decline, eventually having *lower* claims than those agents who started out receiving less. We show that the unemployment benefit rises over the course of the spell.

Hidden savings is naturally relevant in repeated moral hazard models like this one. When savings can be monitored, as in Hopenhayn and Nicolini [1] or the repeated moral hazard model of Rogerson [4], the optimal policy leaves the agent savings-constrained: his marginal utility is lower today than tomorrow. By making an agent poor in the future, it encourages the agent to search harder for a job.

Our paper is related to both Werning [5,6] and Abraham and Pavoni [7,8], who use the first-order approach to study models with hidden savings and borrowing. Briefly speaking, the first-order approach studies a relaxed problem, which replaces the incentive constraints in the original problem with some first-order conditions of the agent. In these papers, the first-order condition for the type that has never deviated in previous periods and thus has zero hidden wealth is imposed.

Werning [5] acknowledges that imposing first-order conditions may not be sufficient to ensure incentive compatibility. Furthermore, Kocherlakota [9] shows that when the disutility function is linear, the agent's problem is severely non-convex and the first-order condition cannot be sufficient. When the first-order approach is invalid, the number of state variables in a recursive formulation would be infinite, making even numerical computations intractable. We overcome this problem by focusing on a special case of constant absolute risk-aversion (CARA) utility from consumption and linear disutility of effort. In this case we conjecture and verify the countable set of constraints that bind. With this in hand, it is straightforward to explicitly solve for the principal's optimum. It has the interesting feature that the incentive constraints of the searching agent never bind. Instead, the binding incentive constraint in any period is the one for the agent who has always shirked, and meanwhile saved.

The basic intuition for this structure of binding incentive constraints relates to the way in which shirking and saving interact. When an agent shirks, he increases the odds of continuing to be unemployed. The unemployed state involves lower consumption, so he wants to save in preparation for the greater probability of this low outcome. Therefore, saving and shirking are complements. The agent who saves the most is the one who has always done maximum shirking, and who knew he would never become employed. Given that he has saved the most, he is best equipped to do additional shirking, which is, again, complementary with saving. This example shows, in two ways, the sense in which the first-order approach is not appropriate for this kind of problem: first, the complementarity between shirking and saving can make the first-order condition for effort insufficient for optimality, and second, since the binding incentive constraint is not for the agent who always searches, it is not enough to look at the always-searching agent's optimality condition in the first place.

The contract we study always implements, at an optimum, a one-time lottery over always searching as hard as possible, or always searching the least, which we refer to as not searching. The interesting case is when the agent searches. The reason for keeping the agent on the Euler equation in this case relates to the savings-constrained nature of the optimal contract in Hopenhayn and Nicolini [1]. There, making the agent poor in the future generates incentives to search today. When the agent can freely save, it is no longer possible to keep the marginal utility of