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Unemployment insurance with a hidden labor market ☆

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ABSTRACT

We consider the problem of optimal unemployment insurance (UI) in a repeated moral hazard framework. Unlike existing literature, unemployed individuals can secretly participate in a *hidden labor market*. This extension modifies the standard problem in three dimensions. First, it imposes an endogenous lower bound for the lifetime utility that a contract can deliver. Second, it breaks the identity between unemployment payments and consumption. And third, it hardens the encouragement of search effort. The optimal unemployment insurance system in an economy with a hidden labor market is simple, with an initial phase in which payments are relatively flat during unemployment and with no payments for long-term unemployed individuals. This scheme differs substantially from the one prescribed without a hidden labor market and resembles unemployment protection programs in many countries.

1. Introduction

Unemployed individuals face a trade-off between search effort and leisure. Since effort is unobservable, the design of unemployment protection programs must balance insurance and incentives. This moral hazard problem has been the object of study since the pioneering work of Shavell and Weiss (1979). In this literature, they assume that employment status is observable and hence individuals cannot defraud the system by working and asking for unemployment payments. But what if there is a shadow economy that allows unemployed individuals to secretly work and, simultaneously, ask for unemployment payments? This paper explores the implications of a hidden labor market in the design of optimal

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unemployment insurance (UI). There are at least three facts suggesting that incorporating a hidden labor market in the study of optimal unemployment insurance might be important[1]:

- The hidden labor market or the shadow economy is important in many countries, accounting for 13–30 percent of GDP in industrialized economies to 39–76 percent for African countries (Schneider and Enste, 2000).
- In economies with a sizeable shadow economy, unemployment is a likely event. On average, unemployment rates range from an average of 6.8 in industrialized economies to 11.6 for African countries (ILO, 2004).
- While coverage, replacement rate, and benefit duration are different across countries, most protect the individuals against unemployment risk.[2] Replacement rates are around 45–75 percent over 1–2 years (Vodopivec and Raju, 2002).

Incorporating a hidden labor market modifies the standard unemployment insurance problem in three dimensions. First, it imposes an endogenous lower bound for the lifetime utility that a contract can deliver. Second, it breaks the identity between unemployment payments and consumption, since unemployed individuals may also obtain resources by working in the informal sector. And third, when more participation in the hidden labor market increases the cost of search effort, the presence of a hidden labor market makes it harder to encourage the job search effort.

Important insights can be obtained in a simple case in which more participation in the hidden labor market does not increase the cost of search effort (linear effort-cost function). Initially, consumption is strictly decreasing during unemployment and individuals do not participate in the hidden labor market. A decreasing path of payments provides incentives for a search effort because unemployed individuals search harder in order to increase expected future income. Since payments are high enough, obtaining extra resources from the hidden labor market is not worth the effort. Together with the drop in payments, there is also a reduction in the continuation utility the contract promises to deliver. For sufficiently large unemployment spells, those promised utilities eventually reach a critical point—the lower bound. At that moment alone, the optimal contract prescribes positive participation in the hidden labor market along with zero unemployment payments. With the jump in participation, the individual smooths out the abrupt decline in payment and hence the consumption path remains smooth. For the more general case, in which more participation in the hidden labor market increases the cost of search effort (non-linear effort-cost function), the numerical solution of the problem is used to characterize the optimal contract. In particular, the model is calibrated to match some moments from the Spanish economy. In this framework, a new intermediate phase arises as a consequence of the effect of participation in the hidden labor market on the cost of search effort. In this phase, the unemployment payment profile is flattened. To the best of our knowledge, this is the first paper justifying a *flattened* payment profile with a subsequent *abrupt decline*. The comparison with alternative environments sheds light on the causes of the flattening and the abrupt decline. The existence of an alternative source of income during unemployment is responsible for the optimality of eliminating unemployment payments for a sufficiently long unemployment spell. Otherwise, long unemployment spells are not serious threats that encourage search effort. The non-observability of the participation in this alternative labor market is responsible for the flattening in the payment schedule. With a steeper profile of payments, unemployed individuals would prefer to deviate from the contract and participate in the hidden labor market.

Unemployment insurance systems have been studied from two different perspectives. One approach uses quantitative general equilibrium models to study the influence of unemployment insurance systems on macroeconomic variables and welfare (Hansen and Imrohoroglu, 1992; Wang and Williamson, 1996). The other approach, followed in this paper, uses contract theory in a partial equilibrium environment to study the optimal design of unemployment insurance. In a repeated moral hazard framework, early contributions find that payments must decrease over the unemployment spell in order to encourage search effort (Shavell and Weiss, 1979; Hopenhayn and Nicolini, 1997). A controversial result from this early literature is that the optimal contract leads unemployed individuals toward 'immiserization'.[3] To prevent this result, Pavoni (2007) imposes an arbitrary lower bound for the promised utility and characterizes the resulting optimal unemployment insurance.[4] Our work is related to this idea because lifetime utility cannot fall below a lower bound. However, our paper differs from Pavoni (2007) in crucial ways. It justifies the existence of a lower bound in lifetime utility by including a hidden labor market where individuals can guarantee themselves a minimum consumption. This is important because the lower bound here is connected to the structure of the economy. More importantly, the dynamics of unemployment payments is substantially modified by the presence of a hidden labor market, even before the lower bound for promised utility is reached.

The policy implications of a hidden labor market have been studied in different environments and with different goals. Among others, labor regulations, wage controls, migration policies, and taxation are analyzed in frameworks with hidden

[1] The informal sector is interpreted as a hidden labor market in which the individual can always find a job but his productivity is lower than in the formal sector.

[2] Also, the number of countries providing unemployment insurance programs increased from 21 in 1940 to 68 in 1997 (based on Social Security Programs Throughout the World, Social Security Administration, U.S., 1997).

[3] More precisely, if the individuals' utility function is unbounded below, then efficiency requires that the individuals' expected discounted utility falls, with positive probability, below any arbitrary negative level (Pavoni, 2007). In this environment, it means that if an individual is unemployed for a long enough time, utility would fall below any bound.

[4] There are several related environments where 'immiserization' does not hold. For instance, see Wang (1995) and Phelan (1995).