Dealing with (Employment) Risk

Dynamic Contract Theory as a tool to design Social Insurance

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The main concern that joins us in this workshop is income and consumption inequality, in particular, the well being of the poor (poverty), or less fortunate (unlucky-risk) in society. I have been asked to make some reflections regarding risk and its relationship with poverty.

I will start by discussing poverty and risk at a general level using the conceptual framework of the recently developed dynamic contract theory. Then, I will argue that this conceptual framework provides an excellent tool to design and evaluate social insurance schemes. I will illustrate this point with the particular problem of unemployment insurance design, a problem I have been working in for the last several years.

Consider two alternative two-period models useful to think about equilibrium income distributions and the relationship between efficiency and ex-post re-distributions.

The first one is a model with different preferences over leisure. Thus, those with a lower marginal utility of leisure will work harder, and in equilibrium will have higher income and consumption. In this deterministic world, the solution to a Pareto problem with the competitive equilibrium weights does not require any ex-post redistribution. This is hardly surprising, since the first welfare theorem applies.

The second one is a model with identical preferences and endowment shocks realized in the second period. If there are no contingent markets, the equilibrium will also be characterized by a non-degenerated distribution of income and consumption. In this case, as the first welfare theorem does not hold, there are efficient ex-post re-distributions. This is the case even considering the Pareto weights that replicate the competitive equilibrium. In fact, efficient ex-post re-distributions are the ones that make the variance of consumption equal to zero.

1 DO NOT QUOTE. These (hectic) notes have been prepared to be discussed at the World Bank Summer Research Workshop: 1999 Poverty and Development, to be held at Washington DC, July 1999.

2 One could well consider the ex-ante (before birth!) utility as a lottery over preference parameters and analyze ex-post re-distributions as an insurance mechanism regarding the (persistent) preference shock at birth. This is a way to look at modern societies attempts to care for the handicapped. We will not pursue this line in these notes.
A model that combines both, would generate some income (and consumption) volatility that should not be redistributed against ex-post (the one due to preference heterogeneity) and some volatility that would be optimally re-distributed off (the one due to the endowment shock).

The main concern with ex-post redistribution is the effect it has on incentives when the realization of some shocks is not observable. The economics literature deals with this problem using optimal contract theory.

The typical result is that efficient contracts do exhibit equilibrium distributions with lower variance than the ones without the contracts, but with larger variance than the ones without private information (Phelan and Townsend (1990), Atkeson and Lucas (1993)). Thus, efficiency requires that not all risk should be insured against, but typically, some of the risk should. In this sense, there is not necessarily a trade off between efficiency and redistribution. Note, however, that in a more complicated model, there may be a trade off between distribution and growth; the same way, there is a trade off between unemployment insurance and equilibrium unemployment rates. It is very easy to increase growth! (or reduce unemployment): cut the ears of those who save less that 50% (or of those who do not find a job).

An obvious underlying question is why should the government be involved in the provision of social insurance at all? Is it obvious in any sense that there is some market imperfection that prevents insurance companies to offer these contracts? This is a very interesting and so far unanswered question and goes beyond the purpose of these notes; let me just suggest a candidate that, to the best of my knowledge, has not been fully explored yet. Consider an economy with ex-ante equal agents and employment-unemployment shocks (or health shocks). Assume that the shocks are highly correlated over time. If agents types are publicly observed, and agents cannot commit to stay in the contract (they can stop paying), once they learn that they are the good type, they may want to quit the contract, as it is standard in adverse selection models. In this case, the only agents that stay in the contract are the high-risk agents, and the insurance mechanism may fall apart. To the extent that the government finances the programs with taxes and it is mandatory, the adverse selection problem may be resolved.

It is worth pointing out that even if government intervention is justified, if the social insurance program is ill designed, societies would be better off without the program. Thus a proper design is the key. Dynamic contract theory (Mirrlees (1975), Shavel (1979) Grossmand and Hart (1982), Spear and Srivastava (1987), Phelan and Townsend (1991), Hopenhayn and Nicolini (1997)) provides the most natural theoretical framework to design and evaluate the programs.

The evaluation phase is essential. Learning through policy experimentation is critical too, since it is very likely that many parameter values are unobservable and cannot be estimated or calibrated with existing data sets.
To conclude, I want to use the problem of unemployment insurance design to illustrate how the theoretical apparatus can be used for policy evaluation. In joint work with Hugo Hopenhayn (1997), we used a calibrated model to evaluate the current US unemployment insurance. We showed how the theoretical apparatus can be used to characterize the properties an optimal unemployment insurance ought to have. We also showed that by adopting the optimal contract, the government could save up to 25% of the current budget.

In Hopenhayn and Nicolini (1999b) we considered the effects of worker heterogeneity on the features that the program should have. The motivation for doing so is that employment risk is very uneven across worker types. In particular, less educated people have higher average unemployment rates, which means that they either face a higher risk to loose a job or a lower probability to find a job, or both. In that paper, we also showed that there is a substantial amount of aggregate risk that should be optimally redistributed out ex-post. We proposed the formation of a contingency fund to provide for the resources to finance the social insurance scheme during bad times for the macro-economy.

A natural incentive problem arises in the design of social insurance schemes that are related to the ability to target the poor ones, when the income level is hard to monitor. A similar dynamic adverse selection problem is worked out and solved in Hopenhayn and Nicolini (1999a) in the context of an optimal unemployment insurance problem.

Decentralization of monitoring activities has been proposed many times as a mechanism to overcome some of the difficulties posed by information constraints. The idea behind the proposal is that small communities have cheaper ways to monitor their members than the federal government. Again, dynamic contract theory can be very handy in here, to the extent that we can quantify the efficiency of the community level monitoring. In this case, the program can have the community to internalize the effect of the private information problem. For example, in the case of PROGRESA\(^3\) in Mexico, we may want to make the contribution that goes to family within a village, to depend on the average grade of the village. The theoretical work of Aiyagari and Alvarez (1997) can be used to shed light on this issue.

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\(^3\) PROGRESA is a direct monthly transfer to poor families conditioned on the success of the kids in school program, ongoing in Mexico for a couple of years.
Summary:

1. Dynamic Contract Theory is an excellent tool to design and evaluate social insurance programs. Unemployment insurance is an nice example of how it works.
2. These issues are particularly important for the poor since there seems to be the case that they face larger risk in some cases.
3. Risk sharing justifies ex-post transfers with equal Pareto weights, so we do not have to rely on preferences over agents to justify transfers (once it has been established that government intervention is called for).

References:


