Mutual insurance without trust

Jean Hindriks, UCLouvain and Itinera

The article by professor Jacques Drèze raises a crucial point about the tension between subsidiarity and solidarity. With short horizon, there is no chance for reconciling the two principles. This is static solidarity with redistribution and no insurance opportunities. But when there is a future to consider, with economic uncertainties, there is room for efficient future risk-sharing. I would like to make two comments on this claim. First future risk-sharing to be efficiently organized required minimal commitment. When we allow for risk-sharing with imperfect commitment, the conflict between subsidiarity and solidarity comes back. Second, separating redistribution and insurance is not so easily done in practice. The issue is where to draw the line between the past and the future when time is passing. I will now elaborate briefly on these two points.

Regional insurance and Commitment

Inter-regional insurance is fundamentally about sharing risk among a group of regions so that no region bears an undue amount of risk. Because of this, insurance can arise even when all parties are risk averse. What is necessary for this to happen is that the risks the parties bear are, to some degree, independent of each other. That is, when one region suffers a loss , there are other regions (or group of regions) that do not suffer a loss. While such independence is usually true of almost all individual risks for which standard forms of insurance exist (fires, car accidents, sicknesses ...) it is less obvious at the regional level. There are some fundamental principles in mutual insurance. First, risk-sharing is more effective the broader the basis on which risks are pooled. This is a consequence of Borch's theorem on mutual insurance. Second, it is more advantageous for any region to engage in mutual insurance with other regions when risks are negatively correlated across regions. Third, there must be minimal symmetry across regions. The reason is that with asymmetric regional distribution of risks, some regions will systematically and persistently subsidize others. The distributional considerations will then dominate insurance aspects. Fourth, risk-sharing arrangements require reciprocal behaviour: a region with a favourable shock accepts to help out other regions if it can reasonably expect that those regions will in turn help it out in bad circumstances. With voluntary insurance, participants are free to opt out at any time and so we must also consider the possibility of risk sharing agreement without commitment.

Without commitment, complete risk sharing is not guaranteed. We must take into account the possibility that the region receiving the gain may refuse to transfer some of the gain to the other region. Risk-sharing agreement without commitment must be "self-enforcing" in the sense that no region has an incentive to defect unilaterally from the agreement. To be self-enforcing, the risk-sharing arrangement must be such that the expected net benefits from participating is at any time larger than the one time gain from defection (by not making the transfer when called upon). If full insurance is not possible, it is still possible to design partial insurance by limiting transfers when the participation constraint is binding.

We can draw several implications from the theory of risk-sharing without commitment. First, the time horizon will influence the amount of mutual insurance that is sustainable. Indeed the value attached to continued insurance depends on the discount rate (reflecting the time horizon). At one extreme of extremely short horizon, the value of future insurance is zero and regions always defect. No insurance is possible. At the other extreme of very long horizon, the value of future insurance is sufficiently high that full insurance is possible. And by a continuity argument, for intermediate time horizon, values, only limited insurance is

possible. Therefore the expected time horizon limits the amount of risk sharing.

The second implication is that the level of risk sharing that regions can achieve increases with risk aversion. The reason is that regions put more weight on the gain from long-term insurance against the short-term gain from defecting.

A third implication concerns the effect of regional inequality. Intuition would suggest that mutual insurance is more likely if regions are ex-ante identical and that regional inequality limits the scope for insurance. But this is not true. The reason is that risk-sharing redistributes ex-post from the region with a positive shock to the other region, but it does not redistribute ex-ante from the rich to the poor regions. More surprisingly, it is even possible that increased inequality, while maintaining constant the aggregate income and the variance of income, would improve insurance.

Regional Insurance or Redistribution?

In practice inter-regional insurance is organized in a federation through federal taxes and transfers. The effect of such a federal tax system is to redistribute income from high- to low-income regions. By pooling income risk across the regions, the federal tax system provides insurance against region-specific shocks. However to the extent that there is ex-ante income inequality between regions, federal taxes also provide ex-ante regional redistribution. We ignore the stabilizing effect of federal taxation which refers to the possibility of smoothing shocks over time (between bad years and good years). The insurance motive for the federal tax system is explicitly recognized in many countries. For instance in the UK part of the tax system is actually called "National Insurance". To appreciate the amount of insurance federal taxes can provide it is necessary to disentangle redistribution from insurance components. Redistribution acts on the initial income distribution, while insurance responds to income shocks (either permanent or temporary).

Assume that regional income at any time is subject to permanent shock (with long lasting effect) and temporary shock. Both shocks are mean zero and add up to the initial regional income distribution. Thus regional income deviates from initial income distribution according to the temporary and permanent shocks. Now suppose the federal tax system taxes all regions' incomes at the same rate and redistributes uniformly total tax revenue to all regions. It follows that region at every time pays taxes proportional to regional income and receives transfers from the federation based on the average tax payment. The income change can be decomposed into an insurance part (smoothing shocks) and a redistribution part (based on the initial income inequality). Using this decomposition, it is interesting to measure the extent of insurance provided by federal taxation in practice. Empirical studies for the US federal tax system clearly suggest the presence of intra-national insurance. Though there is disagreement about the exact magnitude of the insurance, all studies find that the redistribution effect largely dominates the insurance effect. They also find that insurance is rather modest in the sense that it cannot smooth more than 10 cents on a dollar change in state income caused by asymmetric shocks.[19] As far as I know, there is no such empirical studies for Belgium.

[19] See Sorensen B. and Yosha O. (1997), Federal insurance of US states: an empirical investigation. In Razin A. and Sadka E. (eds), *The Economics of Globalization*, Cambridge University Press, pp. 156-72.