

## Risk management in the cooperative contract

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Agricultural marketing cooperatives are important in risk management, but the typical cooperative does a much better job of helping their members manage some sorts of risk than it does others. In particular, co-ops are good at reducing marketing risk, or idiosyncratic variation in prices observed within the course of a single season. However, co-ops are not good at helping to manage production risk, which involves variation in yield over the course of several years. This paper argues that by incorporating a function of history, the co-op could also provide a useful (though limited) form of insurance against production risk.



..../. We consider four different sources of risk faced by the agricultural producers: yield risk, quality risk, basis risk and price risk. Together, these determine the revenue generated by a farmer for a particular crop. By pooling revenues, the co-op can reduce the risk faced by its members. A simple mechanism which would fully insure its members would have four key elements: First, each member would be assigned a delivery target in the cooperative, which is also used to determine their share in the cooperative. Secondly, unless there is a production shortfall, members would commit to deliver all of their production. Thirdly, the co-op would commit to distribute net revenues from the sale of all member's deliveries. Lastly, the co-op could further insure its members against variation in aggregate prices by using future markets.

If commitment is not feasible, this problem can be solved by asking members to deliver only up to their delivery targets. A member who produced less than his delivery target would deliver all of their production to their cooperative. A member who produced more than their delivery rights would deliver only up to their delivery target and then they could either market the surplus outside the co-op or sell the surplus to the co-op. Net revenues would be distributed to members on the basis of shares. What's more, if a farmer makes an unusually large delivery, he is rewarded by being assigned a larger share of

future revenues in exchange for the current subsidy that he provides to other farmers. On the other hand, a farmer who consistently brings in less patronage than expected will tend to see his share fall over time.

Anyone can join the cooperative simply by delivering output, but a "new" producer has an accumulated patronage which will be somewhat less than the total share of his deliveries to the cooperative in the year he joins. Since he thus provides initial subsidy to existing members, he will be welcomed. Because each farmer's share of current revenue depends on his accumulated patronage, he is protected against current production shortfalls. His past deliveries will have sometimes subsidized other members when they had a shortfall and resulted in an accumulation of patronage points.

This scheme has several advantages. Not only does it improve the risk-sharing, but it also makes it easier for the cooperative to deal with arrival of new members, changes in the scale of operations of existing members, and the retirement of old members. Evidence shows that there is an "equity redemption problem" having to do with easing cooperative members out of the cooperative when those members retire. Although solving this and related issues require more research, the dynamic mechanism described here offers a promising approach to solving this problem.



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