Asymmetric Information in the Market for Yield and Revenue Insurance Products. Shiva S. Makki and Agapi Somwaru. Market and Trade Economics Division, Economic Research Service, U.S. Department of Agriculture. Technical Bulletin No. 1892

Abstract

This report analyzes farmers' choice of crop insurance contracts and tests for the presence of asymmetric information in the market for multiple yield and revenue insurance products. Farmers' risk characteristics, their level of income, and the cost of insurance significantly affect their choices of yield and revenue insurance products as well as their selections of alternative coverage levels. Empirical analysis indicates that, in the presence of asymmetric information, high-risk farmers are more likely to select revenue insurance contracts and higher coverage levels. The results also indicate that premium rates do not accurately reflect the likelihood of losses, implying asymmetrical information in the crop insurance market.

Keywords: Asymmetric information, adverse selection, crop insurance, revenue insurance, risk management.

Acknowledgments

This research was funded by the Risk Management Agency (RMA), USDA.

We gratefully acknowledge helpful comments received from all reviewers. We are most thankful to Joy Harwood (ERS) for her detailed, constructive, and extremely helpful comments. We thank James Driscoll (RMA), Robert Dismukes (ERS), and Richard Heifner (ERS) for their insightful reviews and comments throughout the study. We also thank Art Barnaby (Kansas State University), Keith Coble (Mississippi State University), Barry Goodwin (North Carolina State University), Randall Schnepf (ERS), and John Dunmore (ERS) for their valuable suggestions. The authors also wish to thank Martha R. Evans, Wynnice Pointer-Napper, and Victor B. Phillips, Jr., for editorial and production services.

1800 M Street, NW
Washington, DC 20036-5831 April 2001

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Summary

This report examines the effects of asymmetric information on U.S. crop insurance markets when a portfolio of yield and revenue insurance products is offered to farmers. The asymmetric information modeling framework developed in health and automobile insurance markets is applied to the crop insurance market in Iowa, where several yield and revenue products were offered to farmers in 1997. The report indicates inaccurate assessment of individual risks and finds evidence of asymmetric information in the market for individualized crop insurance products.

Since the mid-1990's, a number of new crop insurance products have become available to farmers for managing yield and revenue risks. At the same time, several legislative changes have contributed toward increasing the level of farmers' participation and widening the use of crop insurance as a risk management tool. In some sense, these new insurance products might be very instrumental in increasing efficiency in the U.S. crop insurance market by meeting the needs of different producers. At issue is whether the introduction of the new products increases or decreases asymmetric information problems in crop insurance markets. This study, by analyzing the factors that influence the choice of alternative insurance products and coverage levels, attempts to understand the implications of asymmetric information for assessing risk and setting premium rates in the market for crop insurance.

A Generalized Polytomous Logit model is used to analyze producers' choices of insurance products, and a three-stage least-squares model is specified to analyze premium rates and the choice of coverage levels. Results indicate that high-risk farmers are more likely to choose revenue insurance and higher coverage levels. High-risk farmers are also more likely to choose an insurance product where the guarantee and indemnity are based on individual yields for the producer, rather than a product based on county yields. Results also suggest that high-income farmers are more likely to purchase revenue insurance products and higher coverage levels.

Non-parametric methods are used to test the presence of asymmetric information. The results suggest that individual risk types are not assessed accurately and that premium rates do not reflect the likelihood of losses. Results show that, for individual yield and revenue insurance products, low-risk farmers are overcharged and high-risk farmers are undercharged for comparable insurance contracts. In the presence of asymmetric information, premium rates charged to different risk types are likely to suffer from averaging.

A method of assessing an individual's risk, which includes not only average yield and revenue but also yield and revenue variability, might be the key to reducing rating inequities for individually based insurance products. Even though the analysis is limited to Iowa corn and soybeans, the findings provide useful insights into preferences of farmers of various risk types in choosing among alternative insurance contracts. Analysis of more years, crops, and regions would be useful in comparing results to ascertain the robustness of the findings.