Summary and Conclusions

In this study, we analyze farmers' choice of crop insurance contracts and offer evidence of adverse selection in crop insurance markets. We develop an analytical framework that captures the essence of the current crop insurance market, which is characterized by multiple yield and revenue insurance products and alternative coverage levels. We analyze the impact of farmers' risk characteristics and level of income, as well as the cost of insurance, on their choice of yield and revenue insurance products and alternative coverage levels.

The data pertain to Iowa corn and soybean producers and five different insurance products that were offered in 1997. We include three yield insurance products (CAT, APH, and GRP) and two revenue insurance products (CRC and RA). Among these products, only GRP is a group-based plan with payments made based on county-level losses; the rest are individual plans where payments are made based on individual losses. The data gathered for the study provide the first opportunity to test for adverse selection when a portfolio of insurance products is offered to U.S. producers. The issues we examined and the major findings include:

Choice of insurance product. A Generalized Polytomous Logit model is used to analyze the nominal choice of alternative insurance products. Our results indicate that high-risk farmers are more likely to choose revenue insurance (CRC and RA) over yield insurance (APH). High-risk farmers are also more likely to choose an individual plan (APH) over a group-based plan (GRP). Results also suggest that high-income farmers are more likely to buy revenue insurance than yield insurance.

Choice of coverage level. A three-stage-least-square model is used to analyze the choice of coverage levels and premium rates. The results show that high-risk farmers are more likely to choose higher coverage levels. The evidence is consistent across all insurance products analyzed in the study. We also find that high-income farmers are more likely to purchase higher coverage levels.

Separating equilibrium. Our results indicate that a farmer's selection of insurance contract is significantly influenced by his/her risk type. That is, farmers' selections of insurance contracts are influenced by the extent of risk they face, measured in terms of the probability of yield or revenue falling below the guaranteed level. The data support the presence of a separating equilibrium in the crop insurance market, where low-risk and high-risk farmers are likely to purchase different contracts.

Market signaling. Farmers signal to insurers about the inherent or unobservable risk associated with their farm through their choice of insurance contract. Our analysis reveals that higher risk farmers signal their risk type by choosing contracts involving revenue products and higher coverage levels, while lower risk farmers signal their risk level by choosing yield insurance products and lower coverage levels. Thus, the finding supports the presence of a separating equilibrium and market signaling in the crop insurance market.

Adverse selection. The empirical evidence on adverse selection, assessed by testing independence of the choice of insurance contract and the risk type, using non-parametric methods and by comparing actual and competitive premium rates across risk types, suggests that the premiums fail to accurately reflect individuals' probability of loss and their expected size of indemnity benefits. Premium rates charged to different risk types are likely to suffer from averaging. The area-yield insurance product, GRP, seems to suffer less from adverse selection compared with individualized yield and revenue insurance products, APH, CRC, or RA.

This study is the first attempt to address the potential for adverse selection in a new agricultural policy environment that allows for multiple products to be offered to producers. By examining risk and other characteristics associated with farmers who buy different contracts, it may be possible to structure insurance rates to more closely reflect farmers' risk profiles. A prudent method of risk assessment that is tied to yield and revenue variability might be the key to avoiding adverse selection in the market for multiple yield and revenue insurance products. Even though our analysis is limited to Iowa corn producers, the findings provide useful insights into preferences of farmers of various risk types in choosing among alternative insurance contracts.