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Objective Analysis
for Informed
Decision Making

Implications of Changes in International Market Conditions and Domestic Policies for Producers in the Northern Plains

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Farm programs and trade policies in the United States and other countries change in response to market developments and political initiatives. The effects of these policy changes can differ substantially across regions in the United States mainly because each region has its own unique crop mix, climate conditions, marketing conditions, and economic base. But even within a single region such as the Northern Plains, there is substantial variability in these features that leads to different farm-level and subregional impacts. The objective of this study is to discuss a method that has been used to analyze farm-level economic impacts of national and international policy changes. A case study for North Dakota is presented.

A representative farm model indicates that under the FAIR Act, net farm income will decline in North Dakota.

The North Dakota Representative Farm Model is designed to analyze the impacts of policy changes on farm income. Since the model is not capable of determining equilibrium prices of crops and livestock, it is linked to two large-scale simulation models: the Food and Agricultural Policy Research Institute (FAPRI) model, containing crops and livestock produced in major exporting and importing countries, and the North Dakota State University world wheat model, differentiating wheat in terms of end use and production practices. Results from the national simulation models were used as input in the representative farm model.

The North Dakota Representative Farm model has twenty-four representative farms, six farms in each of four regions: the Red River Valley, North Central, South Central, and Western. The farms in each region are representative of low-, average-, and high-profit farms and small-, medium-, and large-size farms enrolled in the North Dakota Farm and Ranch Business Management Association. The representative farms are developed from the North Dakota Vocational Agriculture Department's farm record system data provided by cooperating North Dakota farmers. The high-profit representative farm is an average of farms in the top 20 percent of farm profitability for each production region. The low-profit representative farm is an average of farms in the low 20 percent of farm profitability for each production region. The large farm is the average of the largest 25 percent of farms for each producing region. The small farm is an average of the smallest 25 percent of the farms for each producing region.

This model is capable of analyzing effects of alternative farm programs and trade policies on average net farm income, debt-to-asset ratio, cash rent, and cropland prices for representative farms that produce five major crops: wheat,

barley, corn, soybeans, and sunflowers. Alternative farm policies affect net farm income for the representative farms. Changes in returns to cropland, given the market-determined capitalization rate, result in changes in land prices. Changes in land prices affect cash rental rates farmers are willing to pay on land used to produce crops. Changes in land price and cash rental in turn affect net farm income through adjustments in farm expenses. These changes affect the debt-to-asset ratios of the representative farms.

The North Dakota Representative Farm model was used to analyze the impact of the 1996 FAIR Act on North Dakota agriculture. Model results indicate that net farm income was highest in 1996 and will decline gradually for the remaining period under the 1996 FAIR Act. Land prices were predicted to be highest in 1997 due to the lagged impact of higher net farm income in 1995 and 1996. Prices were predicted to decline slowly throughout the forecast period. Cash rent levels were predicted to be highest in 1999 and 2000 due to higher land prices in 1997 and were predicted to decline slowly throughout the remaining period. Debt-to-asset ratios were lowest in 1996 and were predicted to increase during the forecast period. The study also found that continuation of the 1990 Farm Bill would have provided less farm income for the first half of the forecasting period and more farm income in the remaining period. As a result, average net farm income under the 1996 FAIR Act was estimated to be similar to that under the 1990 Farm Act for the forecasting period.

About the Author

Won W. Koo is Professor of Agricultural Economics at North Dakota State University. He received his Ph.D. from Iowa State University. His research focus is international trade and agricultural policy.