

Price Determination for Corn and Wheat

The Role of Market Factors and Government Programs

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Introduction

Corn and wheat crops play major roles in the U.S. agricultural sector. As sources of income to farmers, corn cash receipts are the largest among crops, while wheat ranks third. Together, cash receipts for these two grains averaged nearly \$24 billion annually during 1990-96, accounting for over one-fourth of total crop cash receipts.

Corn and wheat have important roles in linkages within the agricultural sector among various crops and between crops and livestock. Each competes with other crops for land in farmers' production decisions, such as corn with soybeans in the Corn Belt and wheat with barley in the Northern Plains. Corn is also the largest feed grain used by the livestock sector. Some wheat is also used for feed, particularly in the summer prior to harvest of major feed grain crops. Further, the United States is the largest exporter of corn and wheat, accounting for over 70 percent of global corn trade and over 30 percent of wheat trade in 1990-96. Consequently, events that affect market conditions for corn and wheat—and prices for those crops—are carefully watched throughout much of the agricultural sector.

The Federal Agriculture Improvement and Reform Act of 1996 (1996 Farm Act) fundamentally changed the nature of farm commodity programs in the United States, furthering trends toward market orientation in the sector. In particular, changes in the income support program for wheat, corn, grain sorghum, barley, oats, rice, and upland cotton shifted much of the risk of price volatility for those crops from the Government to producers (Young and Westcott, 1996). As a result, market information affecting corn and wheat prices is particularly important under the 1996 Farm Act as farmers seek to make informed farm management decisions to manage risk and other market participants work within a more market-oriented agricultural sector.

Each month the U.S. Department of Agriculture (USDA) analyzes major agricultural commodity mar-

kets and publishes annual supply, demand, and price projections for the current year to provide market information regarding the agricultural sector. Additionally, once a year, USDA publishes longer term, 10-year baseline projections for the agricultural sector that include commodity supply, demand, and prices.

This technical bulletin examines some of the factors that affect U.S. farm-level prices for corn and wheat. An annual framework is employed to develop pricing models for use in USDA's projections, in conjunction with ongoing commodity market analysis of supply and demand factors. As such, the models provide an analytical framework for forecasting prices as well as a vehicle for making consistency checks among supply, demand, and price forecasts. The models build on two types of factors that influence prices—market supply and demand conditions, and government policy variables.

Market forces, as measured by supply and demand, influence prices. Year-ending stocks of an annually produced commodity, such as corn or wheat, summarize the effects of both supply and demand factors during the year and are a useful indicator of price movements for the commodity. Annual prices for corn and wheat tend to have a strong negative correlation with their ending stocks. High stocks typically result in lower prices, while low stocks tend to push prices up.

Government programs have also been important in influencing farm-level prices of corn and wheat. However, changes in policies historically have altered the role of farm programs in price determination. Some programs, such as acreage reduction and set-aside programs, have influenced prices indirectly by placing restrictions on the use of land for agricultural production, thereby affecting the supply of agricultural commodities. The 1996 Farm Act terminated supply management programs. Government price support and commodity stockholding programs have also influenced prices for corn and wheat. The nonrecourse commodity

loan program directly affected prices in some periods, providing support to farm-level prices and affecting market equilibrium by influencing private stockholding. However, the role of the loan rate in influencing prices has differed historically as the nature of the commodity loan program has changed under different farm legislation. With marketing assistance loans of current policy, commodity loan rates no longer provide a floor for mar-

ket prices. Thus, one of the key policy variables used in the price models presented here is the commodity loan rate in periods when it affected market prices. Additionally, agricultural programs that have resulted in public stockholding by the Government have affected prices for corn and wheat, and this policy effect is also represented in the models.