AN ANALYSIS OF GRAIN PRODUCTION DECLINE DURING THE EARLY TRANSITION IN UKRAINE: BAYESIAN INFERENCE

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ABSTRACT

The first years of reforms in the former Soviet Union resulted in a sharp decline in agricultural production. Several reasons for the fall have been advanced, including a drop in state deliveries of production inputs, labor and management migration from the large-scale collective system to the private sector, and the transition-related break in old production ties and networks. Little is known, however, about the relative contribution of all these factors to the decline in production efficiency. In this study, we quantify the contributions of weather variability, decline in input quantities, and changes in technical efficiency to the decline in Ukrainian grain production over 1989-1992. We model the stochastic production frontier using a three-level hierarchical model, and estimate its parameters from within a Bayesian framework. In the model, the time-varying technical efficiency depends on farm-specific factors. Non-informative or diffuse prior distributions are chosen where possible. We find that the decline in the use of production inputs accounts for over half of total output decline, while weather effects account for about 35% of the decline. The rest is attributable to a decline in the technical efficiency of collective farms during the transition years.