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Efficiency and Equity of Posted Price Markets for Irrigation Water

Dawoon Jeong (jeong97@purdue.edu)
Juan P. Sesmero (jsesmero@purdue.edu)
Carson J. Reeling (creeling@purdue.edu)

Department of Agricultural Economics, Purdue University

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Efficiency and Equity of Posted Price Markets for Irrigation Water

Abstract

Motivated by key features of agricultural water markets, we study the efficiency of posted-price markets with thin trading among heterogeneous farmers. Thin markets are the prominent market feature empirically observed in existing water markets. Yet, much remains unexamined as to how strategic marketing behaviors of farmers (both sellers and buyers) in thin markets affect the overall market performance such as efficiency and distributional equity. We generate comparative statics characterizing the effects of two key forces that represent irrigation water markets: the degree of traders' heterogeneity and recursive trading. The former is an exogenous characteristic, while the latter is determined by policy. Recursive market designs allow markets to be open throughout the growing season while non-recursive market designs only open the market at the beginning of the growing season. We find that recursive designs improve trading efficiency only when farmers have similar water values. If farmers are highly heterogeneous in value for water, however, recursive market designs hinder trading efficiency. In both cases, recursive markets decrease equity unequivocally because sellers strategically increase markup and collude. Our results imply that the effectiveness of water market institutions is sensitive to how markets are designed. Mis-designing (e.g., allowing recursiveness when farmers are highly heterogeneous) can be avoided by careful market-specific analysis prior to implementation.

Keywords: Market design, Posted Price markets, Water trading, Trading efficiency, Distributional equity, Irrigation.