Regulating Irrigation via Block-Rate Pricing: An Econometric Analysis

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Abstract

In this paper, we adapt Burtless and Hausman's (1978) methodology in order to estimate farmers' demand for irrigation water under increasing block-rate tariffs and empirically assess its effect on aggregate demand and inter-farm allocation efficiency. This methodology overcomes the technical challenges raised by increasing block rate pricing and accounts for both observed and unobserved technological heterogeneity among farmers. Employing a micro panel data documenting irrigation levels and prices in 185 Israeli agricultural communities in the period 1992-1997 we estimate water demand elasticity at -0.3 in the short run (the effect of a price change on demand within a year of implementation) and -0.46 in the long run. We also find that, in accordance with common belief, switching from a single to a block price regime, yields a 7% reduction in average water use while maintaining the same average price. However, based on our simulations we estimate that the switch to block prices will result in a loss of approximately 1% of agricultural output due to inter-farm allocation inefficiencies.

Keywords: Block-Rate Pricing, Irrigation

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