MONOPSONISTIC FOOD PROCESSING AND FARM PRICES: COMMENT

C. S. Kim and Glenn Schaible

In the December 1986 edition of the *Southern Journal of Agricultural Economics*, Kinnucan and Sullivan (KS) presented a monopsonistic pricing model. They applied this model to analyze potential farm impacts of monopsonistic food processing of the West Alabama catfish industry. This comment identifies a critical theoretical error in KS's derivation and illustrates how this theoretical error invalidates their analysis.

THEORETICAL ERROR

KS relied on the familiar profit maximization problem under monopsonistic competition. KS derived the following equation (1), listed as equation (11) in their article, from the necessary conditions of the monopsonist's profit maximization.

$$(1) \qquad P_a = \frac{VMP_a}{1 + 1/\epsilon},$$

where P_a is the farm price of catfish under monopsonistic competition, ϵ is the price elasticity of catfish supply, and VMP_a represents the marginal value product of catfish.

By denoting $VMP_a = P_a^c$ where P_a^c is the price catfish farmers would receive when processing is a purely competitive industry, KS represented the following equation (2), listed as equation (12′) in their article:

$$(2) \qquad P_a = \frac{P_a^c}{1 + 1/\epsilon}.$$

The theoretical error in KS's derivation can be shown with Figure 1. S_a and D_a represent the farm supply of catfish and the processor demand for catfish (i.e., the VMP_a curve) under competitive conditions, respectively. MFC_a represents the marginal factor cost of catfish to the processor.

The critical theoretical error in KS's derivation of the model occurred at the step where the authors erroneously consider that the VMP_a in equation (1) represents the price P_a^* in Figure 1 and P_a^c in equation (2). However, previous studies have shown that the correct price associated with the VMP_a in equation (1) is P_a'' in Figure 1 (Chern and Just; Kim et al.). In order to show this, consider the inverse supply function for catfish, (using KS's notation):

$$(3) \qquad P_a = g(a,z),$$

where the variable (a) represents the quantity of farm produced catfish, and the variable (z) represents exogenous supply shifters. The marginal factor cost of catfish to the monopsonist is then represented by:

$$(4) \qquad MFC_a = \frac{\partial[a \cdot g(a,Z)]}{\partial a} = P_a + a \cdot g_a,$$

where g_a is the partial derivative of P_a with respect to (a). Denoting the supply price elasticity as:

$$\epsilon = \frac{P_a}{a} \cdot \frac{\partial a}{\partial P_a} = \frac{P_a}{a} \cdot \frac{1}{g_a}$$

and rearranging, one arrives at:

$$(5) \qquad g_a = \frac{p_a}{a} \cdot \frac{1}{\epsilon}.$$

Now, substituting g_a in (5) into equation (4) yields:

$$(6) \qquad P_a = \frac{MFC_a}{1 + 1/\epsilon}.$$

C. S. Kim and Glenn Schaible are agricultural economists, Resources and Technology Division, ERS, USDA.
The authors would like to thank Don Negri, ERS, USDA for his valuable comments.
The views expressed here are those of the authors and not necessarily those of the USDA.

By comparing equations (1) and (6), it is now clear that the VMP_a in equation (1) represents the price P_a'' in Figure 1, where $VMP_a = MFC_a$.

For the given farm supply and price received by catfish producers in 1983 (i.e., a* and P_a^*, respectively in Figure 1), KS estimated P_a with equation (2). Consequently, their estimated farm price of catfish under monopsonistic competition is lower than what it would be if it had been correctly measured, and, therefore, their estimates of farmers' welfare losses are inflated. The bias increases in size as the marginal value product curve becomes inelastic.

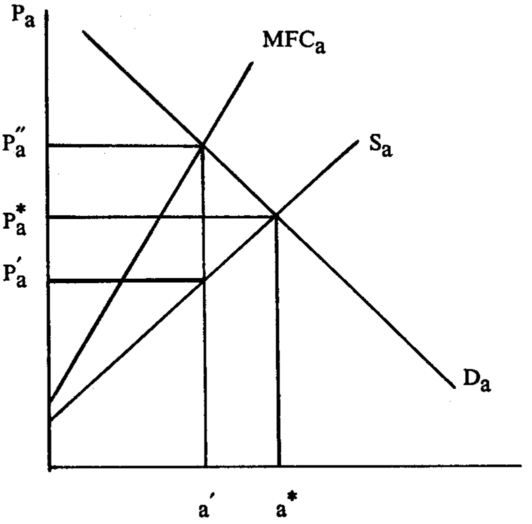

Figure 1. Price Determination Under Monopsony.

REFERENCES

Chern, W. S., and R. E. Just. "Econometric Analysis of Supply Response and Demand for Processing Tomatoes in California." Giannini Foundation. Monograph No. 37, Univ. of California, 1978.

Kim, C. S., G. Schaible, J. Hamilton, and K. Barney. "Economic Impacts on Consumers, Growers, and Processors Resulting from Mechanical Tomato Harvesting in California—Revisited." *J. Agr. Econ. Res.*, 39(Spring 1987):39-45.

Kinnucan, H., and G. Sullivan. "Monopsonistic Food Processing and Farm Prices: The Case of the West Alabama Catfish Industry." *So. J. Agr. Econ.*, 18, 2(1986):15-24.