

from agricultural research is, as a rule, high for developed countries (1300 percent for the U.S.A. in Professor Griliches' estimation), Park's estimate comes as a surprise for a developing country like Korea.

III. Critique

The major deficiency in Park's analysis is that the estimate is based on a hypothetical model that employs a set of highly questionable assumptions. Among such assumptions are:

- Perfect Supply Elasticity--In reality, rice cultivation in Korea can be expanded only with a heavy infrastructure investment. The constant cost assumption in rice production for Korea is utterly unrealistic.
- Equal Input Requirements--As compared with the traditional varieties, the Tongil varieties require heavier inputs including labor hours. Operating expenses per hectare have been higher for the production of the HYV. Thus not only the difference in per hectare yields but also in per hectare input uses should have been taken into account in Park's analysis. Obviously, his results are overstated.
- Closed Economy--There are no imports of rice in his model. Before Korea attained self-sufficiency in 1975, it had been importing 10 to 15 percent of its domestic demand for rice. As will be shown below, the introduction of rice imports drastically changes the model structure.
- Uniform Pricing--The actual pricing mechanism for rice is far more complex than depicted in his analysis. This is examined in the following discussion.

IV. An Alternative Framework

The consumer-surplus approach in Park's analysis is too simplistic and unrealistic to be of much interest. In the following, an alternative framework is offered to describe the rice market situation in Korea.^{4/} In Figure 2 the demand and supply curves are shown by D and S. Point A represents market equilibrium in a closed economy situation. The effect of the improved varieties is displayed as causing a downward shift of the supply curve from S to S'. Distance OG represents an initial equilibrium price which for simplicity is assumed as equal to the government's selling price to consumers (In equilibrium the selling price should converge to a free market price). Government purchase price from farmers is indicated

^{4/} This model is adapted from the Akino and Hayami model with appropriate modifications to reflect the Korean situation (M. Akino, and Y. Hayami, "Efficiency and Equity in Economic Development," American Journal of Agricultural Economics 57 (1975): 1-10)