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# Reflections on Relevance of Agricultural Economics Research: Discussion

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Robinson and Colyer, Skees, and Zilberman offer a number of propositions for improving economists' impact on public policy. Unanswered is what the potential impact on policy would be if these propositions are fulfilled. Couching these propositions in economic theory provides some clues for answering this question. Thus, the main point of this discussion is outlining the role that theory can play in developing hypotheses on the potential impact of these alternative propositions.

As indicated by Zilberman, agents in other disciplines with significantly different academic and social backgrounds have different sets of paradigms. Thus, we are naive in the presumption that our optimal economic analysis should somehow be accepted as dominating all the rest and thus used exclusively for policy formulation. This presumption is based on conventional economic theory that portrays policy formation similar to a Newtonian system, with a unique equilibrium solution preordained by existing institutions, resource and technology constraints, and agents' preferences. Given an economic analysis of alternative policy effects, the theory then states that it is possible to forecast accurately the path of policy formulation towards some optimal policy. This model is flawed. It is incorrect to assume if only we could educate agents in economic theory they would see the light and accept our policies. Different backgrounds will prevent this from occurring. There will be no Pareto optimal improvement. This does not make our policy analysis irrelevant, but the Newtonian implications for marketing our analysis are wrong.

Instead, consider the economic theory of positive feedback. Couching Skees' paradigm of political economy in this theory results in implications of how economic analysis can be used as a catalyst for policy development. Positive feedback is where a small amount of information at a particular point in time can have a major impact on policy. Skees provides an example where anecdotal information, possibly in the form of personal testimony, can at the right moment make a big impact on policy. Thus, depending on some small event, alternative policy outcomes are possible.

Positive feedback economics finds its parallels in modern nonlinear physics. Examples are ferromagnetic materials, spin glasses, solid state lasers, and other physical systems that consist of mutually reinforcing elements. They phase-lock into one of many possible configurations. Small perturbations at critical times influence which outcome is selected, and the chosen outcome may be less than optimal. The extent that small events determine the overall policy formulation suggests that economic analysis should be provided at every stage of the formation process and marketed. This is a closed-loop solution with optimal feedback where the type of economic analysis at a point in time is dependent on current conditions. In contrast, the Newtonian model results in an open-loop solution where the economic analysis is not dependent on the current condition of a policy.

As noted by the Robinson and Colyer and Skees, researchers are generally satisfied with the

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rewards of letting journals market their analysis. Unfortunately, this is Newtonian thinking resulting in little, if any, impact on policy; thus, Robinson and Colyer, Skees, and Zilberman offer improvements or solutions for marketing our economic analysis. Of interest is determining the impact of these solutions based on a positive feedback model. As an example, consider two suggested improvements, confirmation of research results and direct working relationships. Robinson's and Colyer's suggestion of confirmation of research results is weighted towards Newtonian thinking, whereas direct working relationships is more associated with positive feedback.

In terms of research confirmation, the requirement is not whether one particular study can be confirmed, but whether a particular hypothesis based on economic theory can be supported or rejected. Generally, one economic article will not result in a definitive confirmation of an economic hypothesis. Instead, a whole body of research on a particular subject in economics can provide evidence in support of a hypothesis. Robinson's and Colyer's use of invited papers (contract research) for review articles provides a mechanism for confirming various hypotheses. A standard avenue for such efforts is the publication of books that provide a collection of research results not only by economists but also researchers in other disciplines. This is particularly important for marketing of economic analysis when books are directed at policy makers. An example is the recent book by Carlson, Zilberman, and Miranowski entitled *Agricultural and Environmental Resource Economics*. Invited papers and books of this type may over time increase the economic capital of policy makers, but their direct impact on current policy formulation is limited. This is an open-loop control for a closed-loop problem.

A solution that is more in line with positive feedback is direct working relationships with other agents. These agents could be research scientists and/or instructors in other disciplines or policy makers. Agricultural economics has a long history

of working with sister disciplines. Relatively, new journals including the *Journal of Production Agricultural*, provide a marketing outlet for this multidisciplinary research. In the last three issues of the *SJAE/JAAE*, over 30 percent of the articles related to micro- production and marketing were coauthored with researchers in other disciplines. There is considerable interaction with sister disciplines. However, as noted by Zilberman, problems do exist particularly in comparison of engineers with plant and animal scientists. The reason for potentially greater problems with engineers is based on the effect that an economist has on their respective marginal products. Plant scientists have much greater potential for increasing their marginal product when working with an economist, compared with engineers' marginal product associated with an economist. Economic theory and plant and animal science are very complementary disciplines, compared with economics and engineering. Engineers have the tools to readily incorporate any economic technique into their methodology.

Sidestepping the challenges of multidiscipline interactions, the authors' suggestion of increasing and improving direct working relationships with other agents is in the spirit of positive feedback. This has the potential of injecting economic analysis at every step in policy formulation, which can result in significant public policy improvements and in marginal productivity of all agents.

This brief discussion, based on economic theory, of two propositions provides an outline for evaluating others. Considering all propositions for improving the marketing of economic analysis in terms of positive feedback theory will provide a framework for assessing the potential increased contribution of economic analysis to public policy. As stated by Zilberman, agricultural and natural resources are sectors where the contribution of economics has not yet reached its potential. This potential will be achieved if economists market their analyses based on the economic theory of positive feedback.