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Some Issues in Teaching Agricultural Economics to Foreign Graduate Students

B. Delworth Gardner

Several words in the title help set the scope of the paper. My concern is with the training of students from foreign countries, generally those best characterized as less developed countries (LDC's). These students come to the United States to be trained as professional economists and I assume will spend a career researching problems related to agriculture.

What is the rationale for specifying an interest in foreign students rather than discussing the training of graduate students in agricultural economics as a whole? The rationale is a judgment on my part that the work habits, customs, and traditions of professionals in the LDC's, and the institutional barriers to professional productivity that exist there, are frequently quite different from those in the advanced countries. Further, typical professional work in Agricultural Economics is different from that being done typically in the advanced countries and there are implications of this in the training of foreign students.

My main thesis can be simply stated: Most agricultural economists in the LDC's including those trained in the United States, do not view the world as I would expect an economist to view it. This results either from an inability or an unwillingness to utilize the theoretical structure of modern economics. Of course, it must be admitted that there are many individual exceptions to this generalization in most every country, but broadly I believe it holds for all the LDC's with which I am acquainted. Admittedly, also, this thesis assumes a value judgment on my part that there is a unique way in which an economist should see the world and that there are problems in which the economist has special interest. This follows because the discipline of economics has a

set of concerns different from those of other disciplines. It is these concerns that led to the development of a theoretical apparatus that purports to abstract and explain these concerns. It is thus obvious that if the scientific task is to understand and explain real-world problems that theory is an integral and indispensable component of the scientific process.

I also make explicit the value judgment that agricultural economics is a subset of economics where the theoretical tools of economics are brought to bear on agriculture and related sectors of the economy.

These value judgments are crucial and if one does not share them with me, then I am quite sure that my arguments will be unconvincing and we will not have much of mutual interest to discuss fruitfully except the validity of the value judgments themselves. Let me pursue my position a bit further.

A problem exists when something or someone behaves differently than is expected or desired on a *priori* grounds, and this deviant behavior has some special significance under some evaluative criteria. The *a priori* grounds determining what is expected or desired come largely from the theoretical structure of the discipline. Any problem is only a problem when viewed in the context of some intellectual framework. Thus, an economist would see a problem if there seemed to be excess demand in market A. Or, the full economic rent does not appear to be capitalized in the value of land parcel B. In other words, it is the theory that delimits and delineates those issues of relevance, both in terms of what needs to be explained and what is purported to do the explaining. Therefore, I reject Viner's definition of economics (I think made tongue-in-cheek) as that which economists do. That leaves it too loose in my opinion. That slice of the world in which economists have

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fundamental concern is the way society uses its scarce resources to produce desired output (the "efficiency" question) and the ways and means the output is distributed among households and functional groups (the "equity" question). The theoretical underpinnings of these problem areas are rich, complex, and may be controversial; but surely they are the quintessence of the discipline. It is in the context of the theory that problems are defined and conceptualized, hypotheses are deduced, and the empirical data needed for testing are determined. So much for the preliminaries.

Description of Research Reviewed in the LDC's

I have reviewed the published work of professional agricultural economists in parts of South America, the Middle East, and at one station in India over the past ten years. This work was surprisingly similar and, in fact, there was little variation among countries. The studies were predominantly of two types. The first can be characterized as descriptive and institutional with little or no analytical content; i.e., they didn't attempt to establish causation for whatever was described. Rather, they were concerned with the collection and reporting of primary data, generally with a geographic orientation. The household, the farm firm, and local institutional arrangements for marketing output and purchasing inputs might be described with the demographic, social, and political as well as economic parameters receiving attention. Often two or more geographic locations would be compared as respect to these variables, although statistical tests of the significance of differences were invariably not made. Still, because of the existence of alleged differences inferences would be drawn. Statistical testing would have been appropriate because random sampling was commonly utilized to select units of observation.

The other type of study typically had its focus on the utilization of some empirical technique: linear programming, simulation analyses, input-output analyses, and production function analyses were common. These, of course, were more analytical and in some cases at least an objective function was postulated. In no case in my experience, however, have I encountered a study that had an adequate problem definition and discussion of

the underlying economic theory. If there were hypotheses being tested, they were usually implicit and indirect. From a linear program or a production function marginal value products of factors of production, implicit marginal costs, etc. might be derived. But these were seldom placed in a theoretical framework. I got the impression that the researcher was much more interested in demonstrating the use of the empirical technique employed than he was in reliable scientific information that might result from the analysis. In checking further I found that often the researcher had used the same technique in his doctoral dissertation. This should surprise no one in this audience since most of us have done exactly the same thing. In these studies, also, there was little testing of relevant statistics except for occasional tests on regression coefficients and R^2 's.

In sum, what was missing was the very "stuff" of the discipline that I suggested was so important in my introductory section. There was an almost total absence of any meaningful economic theory.

Obviously I should be uneasy about making such sweeping generalizations from so limited a sample and I am. Even that part of the world known as the LDC's is a large place, and I have only seen a small part of it. I have also already admitted that there probably are exceptions even in those areas with which I am acquainted. Still, I am persuaded that I have accurately described the preponderance of work by agricultural economists in the LDC's with which I am acquainted, and further, that the characterization that I have given does not apply with equal force to the preponderance of work being done by agricultural economists in the developed countries, although the same problem is prominent here also.

Alternative Explanations

What is the explanation for the phenomenon discussed in the last section and what are the implications for the training of graduate students in agricultural economics? Before pursuing the topic of the possible weaknesses in the training of students which is the main thrust of this paper, I would like to dispose of a couple of other issues first.

It has been often argued, particularly by non-economist administrators whom I have encountered

in the LDC's, that the economic problems of greatest significance there are so primitive that the highly abstract theorizing that might be applicable in the developed countries is simply unproductive in the LDC's. This argument really has two versions. The first I believe is naive. It is the view that solutions for highly complex problems such as those tackled in the developed countries require highly abstract and complex theories whereas solutions to the simpler and more basic problems in the LDC's require only primitive theories or none at all. In my opinion this is nonsense. Any problem, no matter how primitive, if it is worth investigating at all, merits the application of the best theory we have so long as it is relevant. Why increase the probability of solution failure by applying inadequate or inferior theory to a "weak" problem. The other point is more subtle. It is the typical Marxist view that the theories inherited from Smith, Ricardo, Marshall, Samuelson, etc., are useful only in the context of a specific economic system in which the theory was developed. In the Western World, that system is capitalism, although it may be becoming less so. In the LDC's where the market economy is much less well developed, the economic theory of capitalism does not have the same relevance. Many foreign students from the LDC's bring this view with them when they come for training. There may be a partially valid point to this argument but I believe that it is largely erroneous. So long as it is fruitful to view the household or the farm firm as utility or profit maximizing entities and where markets generate prices that are used as signals for allocating resources, most of our traditional price theory will be useful. For analytical purposes I would hold that households and firms in the LDC's can be fruitfully assumed to be utility and/or profit maximizers. Also, in most of the LDC's, market prices *do* serve as signals for allocating resources over many economic sectors including agriculture. To summarize, I would argue that excellent problems worthy of economic analysis abound in the less developed countries. They need to be adequately conceptualized and our most sophisticated theoretical models can be fruitfully used to develop and test explanatory hypotheses.

There is, of course, a problem if economists would like to proceed in this way but are somehow prevented from doing so by administrators up the

line. This particular problem is likely to be quite severe in most of the LDC's. As a rule, the universities and the government bureaus in these countries tend to be highly authoritarian and tightly controlled by administrators and senior researchers who may be afflicted with a high degree of obsolescence or even more dangerous, with presumed omniscience. It would be highly unlikely in this country, for example, that the president of a university would get intimately involved in the research of grass-roots scientists except perhaps in his own field. Such a thing is not at all uncommon in the LDC's, however. Deans and department heads or their equivalents may also be a problem. In rapidly changing fields, such as economics and agricultural economics, where the rate of obsolescence is high, an obsolete department head or dean who might have control of budget, personnel, auxiliary services needed for the research, etc., might indeed be a severe impediment in the way of an economist doing the things he would like to do in the way he would like to do them. This particular problem is not uncommon in the advanced countries also. As an obsolete ex-department head myself, I can speak with some authority on this question. Despite the ample possibilities for problems in this area, however, I do not believe that this is the prime explanation as to why agricultural economists do not use economic theory extensively in the LDC's of which I am acquainted.

Another explanation that might have more significance is the relationship between theorizing and the existence or nonexistence of reliable secondary data series. In the developed countries, our historians and cliometricians have constructed fairly reliable data series over long periods of time in prices, outputs, inputs, inventories, money, capital stocks, etc. Once a concept is defined and an empirical measure devised, an enterprising and creative cliometrician has usually found a way to extend it backwards in time. These series have proved to be tremendously useful in the testing of hypotheses. But it is expensive to develop an adequate data series. The argument is that where these data do not exist, the testing of hypotheses is much more difficult. It is simply less fruitful to construct the hypothesis in the first place and since the primary use of the theory is in constructing hypotheses, then theorizing, *ceteris paribus*, will tend to have a lower payoff.

This relationship between economic history and economic theory has been stated succinctly by McCloskey: "To pick some influential historical findings that have recently been shown to be false by cliometricians, the finding that the increase in the capital stock per man left much of the increase in income per man unexplained set off in the late 1950's an intellectual explosion in models of growth with technological change. The historical finding that the rate of savings was constant over a long period set off in the early 1950's a somewhat smaller explosion in the theory of the consumption function. The historical finding that the share of labor in income has been constant set off in the 1930's still another in the theory of the production function. The influence of economic theory on the writing of history is apparent in most pieces of new economic history, but the influence of economic history on the writing of theory is apparent only in the seminal pieces, to be forgotten in the sequel. The high ratio of historical reserves to theoretical deposits in the work of Robert Solow, Milton Friedman, or Paul Douglas is not maintained in the work of their intellectual customers, with the result that the intellectual money supply is a large multiple of the factual base and subject to violent fluctuations."¹

Part of the argument here is that the secondary data series are so weak in many of the LDC's that their use in empirical testing is unfruitful. This also helps to explain the exclusive reliance on primary data that one finds in the empirical studies referred to earlier. The future should provide us with a test of this argument, however, we might expect to see more theorizing and more testing as the data series are improved by the cliometricians from the LDC's. There is much of this work now going on, some of it by economic historians from abroad studying in this country and other advanced countries. Still, I am only moderately hopeful that better secondary data will make a major impact on the use of theory. The reason is that one does not observe the lack of good theorizing only where secondary data are relevant and absent. One finds it almost universally.

Perhaps a simple example will suffice to make my point. In the foothills of the Himalayas in

North India, there is a section of the country that has per capita incomes that are substantially below the average in the state of Uttar Pradesh in which the area is located. The farms are much smaller than the state average and the level of agricultural technology employed is inferior to that in most of the remainder of the state. Still, the per capita and per family investment in education is much higher than the state average and average levels of educational attainment are higher than the state average. This situation suggests an economic problem. There is a discrepancy between what might be expected in terms of allocation of resources to education and what one observes. What is the explanation? The theory of investment in human capital would suggest several possible hypotheses that might explain the phenomenon observed. Without going into great detail, one hypothesis might be that the opportunity costs of the children being in school rather than being engaged in work on the farm are much lower given the size of the farms and the underemployment of adult labor in the region. Another hypothesis might be: there are opportunities for migration to other sections of the country and the investment in human capital for those who migrate has a very high payoff. In fact, the rate of migration is large by Indian standards. The list of hypotheses could no doubt be extended, all derivable from the theory of investment in human capital. Yet no such theorizing seems to have been done. Why? I doubt that it can be attributable to the lack of a relevant secondary data series. Primary data were collected but not of the type needed to test hypotheses like those enunciated above. Application of the scientific method would have pointed to theorizing first, then hypotheses, then collection of needed data.

Going back to the main argument, perhaps the explanation for the lack of theorizing is that the training of these professional agricultural economists was weak in theory. This explanation is certainly not self-evident from the transcripts of these economists. Many were trained at some of the most prestigious Departments of Agricultural Economics in their own countries and in the United States. Their transcripts generally show at least one or possibly two graduate courses in price theory, if not more, and at least one graduate level course in monetary theory. I certainly am far from convinced that these were weak courses

¹McCloskey, Donald N. "Does the Past Have Useful Economics." Revised version, University of Chicago, July 1975, p. 29.

or that these students were weak. On the latter point to the contrary, I have generally been very favorably impressed with the native abilities of these economic scientists. At the same time, it is quite evident that many of these scientists either did not learn the theory as students or did not see ways in which it could be applied to their career problem situations.

There are several hypotheses that might be advanced to explain the phenomenon in question. In the first place, learning to use theory is simply not only a matter of taking the requisite courses in economic theory. If, as I have argued, economics is a way of looking at the world through the tools of discipline, the student must have enough time for and exposure to the tools of the discipline for them to gel as a system of thought. For most of us, this takes a rather long period of time, certainly several years. Most American agricultural economists have undergraduate majors in agricultural economics or closely related fields and thus have had enough exposure to the discipline for it to come together eventually as a complete and integrated system of analysis. Despite undergraduate and master's degrees in agricultural economics, however, I must confess that things came together for me only during the second year of my Ph.D. program. Students coming from foreign countries with real weaknesses in English, with no familiarity with American institutions, and with undergraduate degrees which were weak in economics and other indispensable tools such as mathematics and statistics, would begin their Ph.D. work at a great disadvantage. It may take several more years for economics to really gel than for the typical American student.

Unfortunately, many of these foreign students have to rush their graduate training. Their financial support may be limited to a short period. Most of them who come are supported initially by personal resources that are limited to one or two year. Many come from governmental or university posts in their countries which require them to be back on the job in one or two years. This whole business of rushed training seems to me to be a significant deterrent to adequate theoretical training particularly.

Because of the unfamiliar institutional setting in which the presentation of theory is ordinarily made, possibilities for applying the theory may not be so obvious to the foreign students as to

domestic students. This inevitably means that foreign students may have great difficulty applying the theory to their own situations, especially since they don't confront those situations until after their training is completed. There are so many combinations and permutations of institutional arrangements around the world that no American professor can be expected to cover them all in the applications of theory which he makes. It is perhaps this very reason that discourages many teachers of theory from emphasizing application at all. Our teaching of theory is generally weak in application anyway and this is likely to have acute repercussions on the foreign student. It seems a bit curious to me, but not really surprising, that students can return to their countries and reproduce a technique in their research that was utilized in their dissertations, such as the linear programming, or input-output analysis, but have considerably more difficulty generating any theoretical applications of their training. In my opinion, this can mean only one thing: the theoretical concepts, the models economists use to define their world have not really been inculcated in the minds of the students to the same degree as the empirical techniques have.

Recommendations

Besides the obvious recommendation of insisting that the students have enough time to do justice to learning the tools of the discipline, I would make only two recommendations to alter our present requirements. The first would be that every foreign student be required to take a course in the methodology of economics. This course should clearly explain the role of theory in the construction of scientific hypotheses. It should explain what economics is all about, what its concerns are, what its limits are. This course would hone in on the very concerns expressed in this paper. A broader course in scientific method is quite useful and goes part of the way towards satisfying this need, but not all the way. It is the concerns and limits of economics that need to be clearly understood.

Nearly all curricula in agricultural economics presently contain a course in methodology. Often, however, these courses are pitched at science generally rather than economic science, and often

they are optional rather than required. I believe they should be required of all foreign students.

Secondly, I would recommend that all foreign students have opportunity for many experiences in writing and discussing the applications of economic theory to the typical problem situations encountered in their own countries. This may be done in several ways. It might be a weekly tutorial where the professor teaching the theory course might meet with the student to discuss problem formulation, the application of theory, and review the student's written reports where he attempts to apply the theoretical underpinnings to several problem situations. If this is too demanding on the professor's time, then a similar experience could be worked out with near-terminal Ph.D. students replacing the professor in the tutorial experience. Credit, commensurate with the time involved, should be given. The same purpose might be accomplished in small group seminars where the students take turns leading the discussions of theoretical applications to real-world problems. It would seem to me important that the groups be kept small enough so that each

student could have several experiences of this kind and that his thinking could be critiqued by staff members or experienced Ph.D. students well familiar with the problem and what is to be achieved in the experience. Most of our universities have faculty who are experienced world travelers and know the institutions and economic problems of the LDC's and should be utilized in these intellectual encounters.

This familiarity with applying theory would ameliorate another problem common to most LDC's: the reluctance of professional people, including academics, to get into the field and dirty their hands with empirical research. Obviously, the sufficient conditions for solving this problem will not be satisfied by knowing how to apply theory. But knowing how theory should be used will increase the payoff of the research and should conduce to more active participation in the complete process. It would seem to me to be useful for dissertation projects for foreign students to include the complete scientific process: problem formulation, theorizing, hypothesis construction, and empirical testing.