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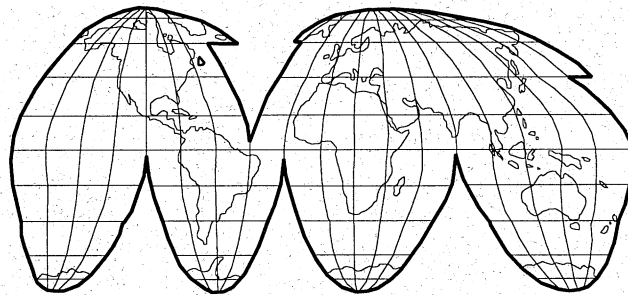
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Implications of the New Growth Theory to Agricultural Trade Research and Trade Policy

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**The International Agricultural Trade
Research Consortium**

**Implications of the New Growth Theory to Trade,
Trade Research, and Trade Policy: Discussion**

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1. Introduction

I appreciate the opportunity to participate in another meeting of the International Agricultural Trade Research Consortium. It is rewarding to think back to the first meetings of the Consortium. We were few in number, but what stimulating discussions we had! The growth in the membership of the Consortium has been impressive -- from 13 at the first meeting to something approaching 170 at the present time.

The importance of the work done by the Consortium is even more impressive. I look forward to once again becoming a full-time participant in your activities in the not-too-distant future.

This has been an interesting and rewarding day. Terry Roe had a wonderful logic in the papers he commissioned for presentation and in the way he organized the day's activities. We have had four quite different papers, but the sequence was designed intelligently, starting with an over-view of the new growth theory and building rapidly through increasingly complex modeling exercises.

As indicated by the title of my remarks, my assigned task this afternoon is to ask the question, "What does it all mean?" It is commonplace to respond to such a question with another one: "Was the bottle half full? Or half empty?" In the present case my response to the second question is that the bottle is half full. Even though it might in fact be more than half full, there is still a long way to go to have an operational model of the complex interface between trade policies and economic growth.

I want to divide my remaining comments into three parts. The first consists of three comments of generic interest to the general theme. The second part presents some suggestions for future research. And the third part has some comments on policy. At the end I will have some **concluding** comments.

2. General Comments

The extent to which international trade issues have become integrated with growth theory to provide the basis for more robust economic development policies is remarkable. It wasn't so many years ago that courses in economic development were taught from the perspective of closed economy models, with very little attention to trade theory. The main way in which domestic economies were opened to the international economy was by way of the two-gap models, which for the most part provided the means to accommodate savings from the international economy. Now, I find that I often have to hold special complementary classes in which I teach the students enough about trade theory so they can understand the core development theory and policy.

In addition, the perspective taken about trade issues themselves has changed 180 degrees. Earlier discussions of economic development often argued the case for protectionism as the means to promote import-substituting industrialization. This was especially the case if the subject was economic development from a Prebisch perspective.

From the perspective of the new growth theory, trade liberalization is the basis for economic development policy, with the emphasis on trade promotion or policies that make it possible to expand exports. The main thing remaining from Prebisch is recognition that economic development takes place in an international setting (an important contribution he made to the literature), and that development and trade policies can influence the development process in a given country.

As a final comment, the importance and significance of misguided economic policy is worth noting. Import-substituting industrialization policies behind protective barriers are now generally recognized as having been a failure. It is interesting to speculate about the significant economic growth sacrificed by the pursuit of such policies, especially in Latin America. In fact, with the growing ability to simulate growth over extended periods of time by means of computable general equilibrium models, it would be possible to estimate just how much Prebisch and his colleagues in the Economic Commission for Latin America (ECLA) (CEPAL in Spanish) cost individual countries such as Brazil and Mexico in foregone economic growth. This could produce a valuable set of empirical results that could be used to persuade policy makers to continue to turn away from the autocratic policies of the past.

3. Some Implications for Trade Research

Many of my suggestions for research address concerns I have about the papers we have heard today. Let me note from the outset that none of these deal with the technical aspects of the modeling efforts. I do not feel qualified to do that, nor is discussing such issues my particular wont.

In the material which follows I will discuss four sets of issues: (1) the data; (2) institutional arrangements; (3) some ambiguities; and (4) the neglect of the household.

3.1 The Data

We are obviously at a point at which our capability for modeling has out-paced the amount and quality of data we have to make use of that capability. Each of the authors of the papers recognized the deficiencies in their data.

As a profession we need to give more attention to these issues. We need to give more attention to the kind of data we need, to assuring that the data corresponds with the underlying concepts from the theory, and that the concepts themselves are correctly specified. Some of these data can be produced with our own efforts. Developing appropriate data is perfectly honorable and respectable work. The quality and power of what we do in the future will be largely dictated by what we do to

assure that we have quality data. Once we have such data in hand, then we need to make sure that data are added to our common public stocks and thus available to everybody.

We also need to work more closely with policy makers, the Congress, and those in data collecting agencies to impress upon them the importance of additional data. The availability of data has declined significantly over the past decade, often for political reasons. Efforts to increase the amount of data collected on a regular basis should also be directed to improving the quality and relevance of the data. Our economy and those abroad have changed significantly in the post-World War II data, as has our ability to utilize such data. We need to commit more effort to identifying the kind of data we need, and then give more attention to the precise concept we want to measure.

Economists in this nation are committing substantial intellectual input into developing increasingly powerful models that enable them to take advantage of the computer revolution. But what good does that do us if we don't have adequate data of high quality to make effective use of them. No policy maker, nor no private agent, will find us credible if we use artificial and worthless data as the basis for utilizing our powerful models.

3.2 Institutional Arrangements

The results of the empirical studies we have heard reported today give very little attention to institutional issues, nor do the models recognize institutional arrangements as a form of human capital. As somebody put it during one of our discussion periods, institutions are imbedded in the models. But in point of fact, we know very little about just which institutions are so imbedded. All we know is that some (unspecified) institutional arrangements are reflected somehow in the structural parameters.

There are a number of important issues to consider. For one thing, policy is imbedded in institutions. One cannot say a great deal about policy without considering the institutional arrangements through which it is delivered. Although each of the papers we have heard today has discussed policy, I believe there would be general agreement that the policy instruments considered have been rather naive. The issue of where the R & D is done, in what kind of institutions, and so on, are very important issues. Yet, there was no discussion of how the R & D was produced and diffused to the private sector. It was as if the R & D fell like manna from the sky.

Another dimension to this set of issues, and one designed to give more importance to my main point, is to recall Vern Ruttan's astute observation several years ago to the effect that institutional arrangements are the output of social science research in the same sense that new production technologies are the output of biological and natural scientists and engineers. Can we really neglect such important outputs of our own substantial research efforts?

This brings me to my final point under this rubric -- that institutional arrangements are an important form of human capital. The new institutional economics of Douglas North and the modern economic historians has given us a rich analytical framework which

makes it possible to do something other than take institutional arrangements as exogenous variables. In their hands, institutional arrangements both influence economic behavior and performance, and are in turn influenced by these same economic forces. In other words, institutional arrangements -- an important form of human capital -- are endogenous. If we are to have a more complete theory of endogenous growth and trade, we need to address this set of issues.

3.3 Some Ambiguities

I was struck in reading the papers, and in listening to their presentation today, about the ambiguity in many of the concepts used. Let me mention three concepts that are important in the papers we have heard, but which received very little specificity as they were used: (1) knowledge capital; (2) R & D; and (3) human capital. The lack of specificity in defining these concepts was particularly frustrating, in part because they are so critical to both the analytical and empirical work, but also because of their relevance to both the policy and institutional issues.

Does R & D refer to all efforts to produce new knowledge? Applied, basic, and strategic research? Or does it refer only to the applied research that private companies do? Is it done by both private and public institutions? If so, shouldn't the models differentiate among the institutional arrangements? And so on. There are a lot of black boxes staring the reader in the face.

The same issues apply to the concept of human capital. Some of us use that concept to refer to the full array of human capital, including genetic endowments, culture, institutional arrangements, education and training, health, nutrition, and so on. Yet there was a tendency in the papers to take the Lucas definition of human capital, to be only labor skills. Important as that concept may be, we are left with a lot of open or empty boxes. (Incidentally, I was tempted at one point in preparing these remarks to entitle my paper "Black Boxes; Empty Boxes."

3.4 The Neglect of the Household

The neglect of the household in both the analytical and empirical work we have heard is as serious as the neglect of the institutional arrangements. The significance of the household is two-fold. First, it is the place where a significant share of the human capital is produced for the society and economy -- health, nutrition, children, education, values, and so on. No endogenous growth model, nor any endogenous trade model, worth their salt can ignore these important factors. Yet, the papers we heard today treat the household only as a source of consumption and savings, and as a place to apply income taxes. We really need to move beyond this naive perspective.

Second, the technology of the households, when they are properly viewed as production units, is also important as a source of economic growth and as a determinant of competitive potential for a nation as a whole. We in the developed countries tend to take the household as a given. It is only when one turns to the developing countries that one realizes the importance of household technology in making it possible to release women to the labor market and to improve the quality of the children and in turn the labor force.

To conclude this section, I want to caveat my remarks by giving value to what has been accomplished. I am sure the endogenous growth models and endogenous trade models are the way to go in garnering relevance to contemporary problems and in designing both development and trade policies. My point is that in the development of these models we have neglected some very important areas -- and areas in which we have an ample stock of knowledge on which to build.

This neglect can lead to important errors in statistical inference, and in turn to errors in policy. For example, if human capital in the household, and in the form of institutional arrangements, should be highly correlated with human capital in the labor force and private sector, the estimated rates of return for the latter will suffer from specification bias. This bias will be upward, with the result that we will be over-estimating the social rate of return to investments in human capital in the private sector and in the labor force, and over-investing in those activities. If there should be a high level of complementarity between the human capital in the household and that in the private sector, the investments in the human capital in the private market economy will prove to be disappointing. Thus, including the human capital in the household, and taking account of the institutional arrangements in society, is not just an aesthetic issue of making the models more complete. It is a case of having sound knowledge on which to base development policy.

4. Some Thoughts on Policy

One of my special areas of interest is science and technology policy. I read the papers with the thought that I might gain some insights into that subject. Unfortunately, I learned very little -- on what is a very important public policy issue.

Let me be more specific on a rather important issue. I am concerned that as the global economy becomes more open, national governments have less and less incentive to invest in basic research. The benefits of such research will tend to spread world-wide. Therefore, why should any government invest in it? It is important to note that the U.S. is shifting its science and technology portfolio increasingly to the applied side.

What kind of institutional arrangements are needed to address this problem? Will it take international collaboration to attain socially optimal levels of investment in basic research?

In other contexts I have argued that we should dispense with the concept of foreign aid and in its place use the concept of international cooperation. From that perspective I have argued that this nation should put all its resources for international cooperation into investments in human capital. The center-piece of such a policy would be to create an Institute for International Cooperation in Science and Technology. This Institute would make investments in science and technology programs that link institutions in this nation with similar institutions in other countries. It would make investments only with matching grants from both sides of the arrangement.

The value of such a policy is that we would be making investments that would be in our own interests. We would strengthen our own institutional arrangements, while at the same time enriching

the knowledge base in our institutions of higher education, and thus improving the international dimension of the educational programs we offer. The longer term effects on our international competitiveness in international trade could be significant.

Do the empirical results we have heard give us any guidance on this important issue? I think not, largely because institutional arrangements have been largely ignored.

A second science and technology policy issue involves the need for investment in maintenance research. Vern Ruttan argues that in the developed countries in which considerable progress has been made in raising the productivity of particular commodities, as much as 90 percent of the contemporary research budget has to go for maintenance research. I mention this issue only because it underlines the importance of an issue I raised earlier in this paper. When making cross-country comparisons, or when working with time series data, a dollar of expenditure is obviously not a dollar in all cases. It depends on many other things.

More generally, there are many other policy issues we could consider. For example, I am struck by how useful it would be to give some attention to understanding past economic development in Latin America. Policy discriminated severely against agriculture, in part by means of grossly over-valuing national currencies. What effects did those policies have on aggregate growth rates? What effects did they have on the sectoral allocation of research resources? By reducing the potential payoff of research for the agricultural sector these policies could have resulted in the low rates of investment in agricultural research.

Finally, I want to note how disappointing it was to find so little material on the distribution of benefits from the endogenous growth and the endogenous trade. The distribution of these benefits is the key to understanding the sustainability of the implied policies. This assertion closes the circle on my argument about giving more attention to institutional arrangements.

5. Concluding Comments

There is much that comes from these new models, and especially from trying to use them to generate empirical results. For example, Baldwin reminded us of an important insight in his paper when he reminded us that there is no way we can make blanket statements such as "Openness is good for economic growth." That was a useful reminder that we are almost always in a second-best world.

Another was the Stolper-Samuelson-like results Diao and Roe found with their model. Although their explanation is very plausible, once we hear it, one would hardly have been looking for such results if one weren't working with a computable general equilibrium model. The same applies to the destructive effects on human capital that comes from modernization. Although this effect was recognized a long time ago by no less an authority than Schumpeter, it is seldom recognized in the contemporary literature, and especially in that part of the literature that deals with science and technology policy. Similarly, it seldom rears its head in dynamic computable general equilibrium

models that by definition should take it into account.

By way of raising still another issue about these models, one might legitimately raise a question about the extent to which some of the results obtained, especially with regard to policy, are due to what one might refer to as "constructed" results. In other words, to what extent are the specific empirical results the result of key assumptions that went into the model, either about behavior or about particular technical parameters. Moreover, how robust are the results obtained to different values for these parameters? Some sensitivity analysis would have provided insight into this important issue.

Finally, let me call your attention to the Stiglitz article which Terry Roe circulated among those of us on the program. It is a rewarding and important paper -- one with an institutional richness one seldom finds. The title of the paper is "Some Lessons from the East Asian Miracle," and it is published in *The World Bank Research Observer*, August, 1996.

To conclude, we have heard some excellent papers. I encourage you to read each of them. They each, in their own way, contribute a great deal to our knowledge. Moreover, they are an important way of catching up with what are two of the most exciting fields in economics -- endogenous growth theories and the endogenous trade models they imply. These are important intellectual developments that are making it possible for us to understand a great deal of the world around us.