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WHAT AGRICULTURAL EXPORTS MEAN TO AGRICULTURAL RESEARCH*

G. Edward Schuh**

The decade of the 1970s witnessed an unprecedented export boom for U.S. agriculture. By the beginning of the 1980s as much as 30 percent of the cash marketings of agriculture were attributed to foreign markets, and the output of two out of every five acres, or 40 percent of our land, was being shipped abroad. For some commodities the data were truly dramatic. We came to export approximately 65 percent of the wheat we produce, more than half of our soybeans, over a third of our corn, and large shares of our rice and cotton.

The extent to which the welfare of U.S. farmers came to depend on foreign markets has been brought to a sharp focus by the sharp decline in our agricultural exports in the 1980s. The value of those exports declined slightly over 20 percent from 1981 to 1983. At the same time farm income has plummeted, farm program costs have skyrocketed--to some \$35 billion for a sector with a net farm income estimated to be about \$19 billion. And this past year we paid our farmers to idle some 70 million acres of one of this nation's most productive resources, with very great ramifications for the rest of the economy. We will pay the costs of that forgone output for some time.

It wasn't just the decline in exports that created all these problems, of course. But our increased dependence on trade and the other changes in the international economy gave rise to conditions which were new, and to which we didn't adapt. The result has been a veritable disaster for agriculture, and in some respects for this nation's economy as a whole.

The point is that the increased dependence of agriculture on international trade, combined with other changes in our economy, modified both the setting and the landscape of agriculture. These changes should have affected both our agricultural research agenda and the way we do our research business. Unfortunately, it has done neither. Consequently, what was once this nation's most effective research establishment is no longer serving either our farmers or our nation very well. The challenges before us are indeed great if we are to rebuild our effectiveness and re-establish our credibility with those we intend to serve.

My remarks today are divided into three parts: (1) a brief discussion of the changed economic setting of agriculture; (2) a review of some of the needed changes in our research agenda; and (3) a brief discussion of our institutional challenges. At the end I will have some concluding remarks.

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THE CHANGED SETTING OF AGRICULTURE

It wasn't many years ago that agriculture could be treated as essentially a closed, self-contained sector of the economy. Exports were not very important. The nation's monetary policies had very little significance to agriculture. What happened in the rest of the world didn't matter. And we could design commodity policies without a great deal of concern about the rest of the world.

Those conditions no longer prevail. In this section I want to discuss how that economic setting of agriculture has changed.

Increased Openness to the International Economy. We can talk about this in a number of different ways. We can talk about foreign markets making up a larger share of the total demand for U.S. agricultural output than it did in the past. Or we can say that exports account for a larger share of our GNP than it did in the past.

Independently of how one chooses to describe it, the fact is that agriculture's dependence on exports approximately doubled during the 1970s. Moreover, the same thing happened for the economy as a whole. So what was happening to agriculture wasn't unique. In fact, if one extends the period back to the mid-1960s, the openness, or dependence on trade, of the U.S. economy as a whole about tripled.

There are two important implications of this development. The first is that what happens in the rest of the world became a great deal more important to U.S. farmers and consumers. We know that now because we've observed that what happens to Soviet agriculture has a great impact on us, as does what the Brazilians and Argentinians do about their soybeans, and what the European Community does about its agricultural policies.

The second implication is that our economy moves increasingly beyond the reach of our domestic policies. By becoming a part of an interdependent world economy, our economy becomes less and less responsive to domestic policies.

Increased Significance of Monetary and Fiscal Policy. In the 1950s and 1960s, monetary policy had very little impact on agriculture. (By monetary policy I mean the rate at which the Federal Reserve injects money into the system--a phenomenon reflected primarily in the level of interest rates.) Monetary policy could be whatever it wanted to be and it didn't matter to U.S. farmers.

Two developments during the 1960s and 1970s changed that situation, and changed it dramatically. The first was the evolution of a large, well-integrated international capital market. The second was the shift in 1973 from a system of fixed exchange rates to a system in which the values of the U.S. dollar and other currencies were determined in relatively open foreign exchange markets.

The consequence of those developments was that agriculture, as an export

sector, began to be one of the sectors that has to bear the adjustment to changes in monetary policy. Agriculture is forced to contract and expand as monetary policy alternates between trying to restrain the economy and trying to stimulate it. The important point is that in this new environment, it is primarily the export sectors like agriculture and the sectors that compete with imports like the automobile, steel and textile industries that have to bear these adjustments. The non-trading sectors are affected only indirectly.

This problem has been exacerbated by the great increase in monetary instability during the 1970s and early 1980s. We have swung from periods of exaggerated monetary ease to periods of exaggerated monetary tightness. This has imposed large monetary disturbances on agriculture. These swings have been the source of the great instability we have been experiencing in agriculture since the early 1970s.

Commodity Policies That Don't Serve Us Well. Our commodity programs were designed for the most part back during the 1930s and the early post-World War II period. We made some changes to accommodate an increased dependence on trade in 1973 and 1977, but the programs are basically the same as originally designed.

The problem is that our economy has changed a great deal since that period. And in the kind of world we now live in, those programs have become a barrier to adjustment in a setting in which a great deal of adjustment is needed. Rather than encouraging farmers to respond to changing market conditions, our programs encourage them to shoot for full production year after year, while pricing us out of the market when the dollar gets as strong as it has in recent years. Not only do they price us out of the market, they provide very strong incentives for producers in other countries to increase their agricultural output. Nothing could be more counterproductive.

The Growing Importance of the Third World to U.S. Agriculture. U.S. farmers now have a vested interest in what happens to the less-developed countries. Our markets in those countries expanded as rapidly in the 1970s as did our markets with the Soviet Union and other centrally planned economies. Moreover, our potential for future markets lies in large part in those countries.

The past growth in those markets has been with countries that have experienced significant increases in per capita income. Our future markets, in a similar way, will be in those countries that grow and develop. Hence, if U.S. farmers want their markets to grow, they will want those countries to develop. Consequently, we should want to do everything we can to assist them.

The Need to Remain Competitive. We pride ourselves on having the most productive agriculture in the world. And if our productivity is high, we ought to be able to remain competitive. But from 1981 to 1983 our export markets declined by some 20 percent--and yet we obviously didn't have a 20 percent

decline in productivity in that period.

This points up a number of important issues. In the first place, remaining competitive involves more than productivity. It involves the kinds of commodity programs we have, the pricing strategy we follow, the trade barriers we face and what we can do about them, and the deficit we run on our federal budget. In the last case, it is our large deficits and the high interest rates that are a logical consequence of those deficits that cause the strong dollar, which in turn makes us less competitive.

Clearly, just diffusing new production technology into the system is no longer sufficient to keep us competitive in international markets. We need to work on all these other things in order to retain and expand our markets.

NEEDED CHANGES IN OUR RESEARCH AGENDA

In the previous section I have outlined the changed setting in which agriculture finds itself. The changes I have reviewed should have modified our research agenda in very significant ways. Unfortunately, they haven't. Instead, we tend to limp along with a research agenda that very much reflects the kind of world we used to live in. That agenda no longer serves us or our constituents very well.

The changes we need include a different perspective on our production technology research; a shift in relative emphasis between economic and policy work, on the one hand, and biological and physical research on the other; a shift in the research agenda of the economists themselves; and the need to better understand the international economy of which we are a part.

Let me touch on each of these topics very briefly.

A Changed Perspective on Production Technology. Interestingly enough, we have justified our work on production technology in large part on the grounds that it was going to increase the welfare of farmers. We always believed that raising productivity in agriculture would raise farm incomes.

In some sense that was the case. Farmers have the per capita income they have today mainly because new production technology has raised the productivity of resources they own, and because that technology enables the individual farmer to control and manage a larger bundle of resources.

At the same time, we also know that fewer people can be farmers now than in the past, and that in fact there has been a mass exodus from agriculture. In addition, we know that a major share of the benefits of that new technology didn't go to farmers at all, but instead was passed on to consumers in the form of lower prices. As a nation, we have benefited greatly from these developments. But it hasn't always made life easy for farmers.

The need for new production technology is every bit as great today as it was

in the past. However, we need to change the perspective we take towards it. That new perspective needs to put a great deal more emphasis on helping our farmers remain competitive in an increasingly competitive international economy. That means it needs to be focused so as to make us more competitive relative to our strongest competitors. And that means we need to understand our competitors--and the basis of their ability to compete with us--and then to design a technology that will help us compete. We need technological assessments of the various sectors of our own economy. And we need it for similar industries in other countries.

I think it fair to say that we have not taken that perspective in the past. We need to develop it, and to develop it quickly.

The Increased Importance of Economic and Policy Research. If most of you will examine the allocation of your budgets between economic research, on the one hand, and biological and physical research, on the other, you will find that the share allocated to agricultural economics will run from about 3 percent to 6-7 percent of the total. The remainder will be directed to generating new production technology in one form or another.¹ Moreover, the bulk of your staffs will be in the physical sciences and technological disciplines.

That allocation was probably proper back when agriculture could be viewed as a closed economy, when commodity programs essentially took care of farmers' marketing problems, and when there were no financial problems to deal with. However, that is no longer the situation in which we find ourselves. Farmers today are faced with severe marketing problems; they are faced with severe financial management problems; they have commodity policies that don't serve them well; and they face an international competitive situation that they understand only poorly. Monetary and fiscal policies impose large shocks on agriculture that also are poorly understood.

To summarize, farmers today face severe economic problems. Yet we fail to address those problems in the way and on the scale that we should, and instead continue to generate new production technology as if producing more and more efficiently were going to solve all the problems farmers face.

Economic issues need to be moved up much higher on our research agenda. Every survey of farmers I have seen has found them asking for more help on marketing problems, on their financial management problems, on agricultural policies, and on trade problems. Are we really responding to our changed economic environment? Have we shifted our allocation of resources in directions that will respond to these needs? I think you will find the answer to this question is generally in the negative.

Changing the Research Agenda of the Economists. Not only does the budget for economic research need to be increased, but the economic research agenda itself needs to change. Agricultural economists in this nation have tended

¹This disparity will remain even if account is made for the fact that biological and physical research tends to be more costly than economic research.

to be very micro- or farm-oriented and with that, rather production-oriented. There has been some attention given to marketing, but not very much. And policy research practically disappeared in the 1960s.

This past perspective is very understandable. Given the nature of our commodity programs there wasn't much of a marketing problem to worry about. Conditions in financial markets were quite stable. And the commodity programs were pretty well locked in. A political decision had been made and there wasn't much to do about it.

The changed conditions of agriculture have changed all that. The policy issue is once again up for grabs. Major shocks to agriculture are imposed by monetary and fiscal policy. Changes in the value of the dollar impose large adjustments on agriculture. Farmers face very difficult and complex marketing problems. Their problems of financial management are great. The trade and domestic policies of other countries have a great influence on U.S. agriculture. And comparative advantage in the international economy is going through very rapid changes.

Most of these are almost completely new agenda items for both agricultural economists and the rest of the agricultural research establishment. We have very few skills to deal with them, and in some respects even less proclivity to take them on. Consequently, the issues that really matter to the welfare of U.S. farmers are either being left to others or being neglected entirely.

The Need to Understand the International Economy of Which We Are a Part.

Our ability to meet our competition and remain a viable factor in international markets will be very much determined by our ability to understand that competition and to develop a strategy to meet it. That means that we need to know a great deal more both about the agriculture of other countries as well as the policies they have for their agricultural sectors. And this knowledge has to be more than economic intelligence which keeps us advised of what is going on in those countries. It has to involve understanding the competitive potential of other countries, the consequence of their policies, and how we all fit into an international trading system.

Unfortunately, we devote only very limited resources to understanding the agriculture of other countries and virtually nothing to understanding their policies. And when we do do some research on other countries, it is usually done in the context of helping the other country--often as part of our foreign assistance programs. We greatly need to change our perspective, and to change it soon. If we don't, we will continue to be blindsided by changed competitive situations in country after country.

I want to emphasize that this is not just an issue for the economists. To understand our changing comparative advantage and competitive position in the international economy we need to understand the agriculture of other countries in all its dimensions. We need to understand the soils of those countries, the plants and animals they have and their ability to respond to changing economic conditions, the production technology they use now and may be using in the future, and so on. This is a big order. But we ignore it at the risk of further adding to our growing irrelevance and a failure to

properly serve our constituents.

As a final point here let me emphasize that our research on other countries should not be done solely as part of a foreign assistance program, important as that may be. It should be done as something in our own interests--and in the interests of our farmers.

OUR INSTITUTIONAL CHALLENGES

The changed economic conditions of agriculture and the changed research agenda I have sketched out for you pose very serious challenges to the way we are now doing our research, to how that research is financed, and to our in-house capability--or lack thereof--to do it. If we are really to serve our farmers, our consumers, and the nation as a whole, we need to devise new financial arrangements for agricultural research, we need to organize ourselves differently for at least part of our research, and we need to have new research capabilities.

Let me address each of these briefly.

The Financing of Agricultural Research. Historically, much of agricultural research has been justified on the basis of the benefits it was expected to provide to producers. As we all know, the results were in many respects just the opposite. It was the consumers who benefited, and farmers had to bear rather large adjustment costs as fewer of them were needed to produce the nation's food and fiber. The contribution of new production technology to the present income of the remaining farmers should not be ignored, however. Their productivity is the key to their incomes.

Expanding exports have changed the conditions of demand for U.S. agricultural output, and therefore have changed the relative distribution of benefits from new technology. In the future, producers will receive a larger share of the benefits of new technology if we are in fact able to remain competitive in the international economy. This suggests that producers should be paying a larger share of the costs of research programs.

At the same time, the nation as a whole benefits from a stronger competitive position in international markets. That would strengthen our balance of payments position, making the dollar stronger, and thereby benefiting consumers in a relative sense. A strong dollar also enables us to more efficiently maintain our international military, political, and economic position. This suggests that the federal government should be paying a larger share of the costs, since a larger share of the benefits consist of spillover effects.

It should be noted that via the various commodity checkoff funds, producers are already paying a larger share of the costs of our research programs. Moreover, almost all of that money is used to support biological and physical research. One concern we need to have about this shift is that checkoff

funds tend to be unstable as the vagaries of the industry change. Another concern is that little of this money is being allocated to address the economic problems farmers face, nor has there been a corresponding shift in state and federal research monies to help fill the gap.

Organizational Issues. It isn't realistic for us to think that every state will be able to take on the expanded research agenda I have outlined above. But in my judgment it would also be a mistake for us to leave that agenda to some monolithic organization in the federal government.

The soybean industry of the world is of interest to our soybean producers, and these producers are concentrated regionally within the United States. The same applies to wheat, corn, cotton, rice, and other export commodities.

Similarly, the effects of monetary, exchange rate, and trade policies have very important regional dimensions. It is even doubtful if research on our own domestic agricultural policies can be done by individual stations any more, except in a few limited instances. It is just too costly. And given the political sensitivity of many of these issues, do we really want to leave them to the federal government alone?

In my judgment we have a great need to evolve a set of specialized research institutions to take on some aspects of the new research agenda before us. Some of these can probably best be regional institutions. Others may best be independent national organizations. But we need to get on with developing the needed institutional capability.

The Staff Development Challenge. To take on the new research agenda before us we need significant changes in the talents and capabilities in our research establishment. Speaking broadly, we need people with language skills who can work effectively in other countries. Then we need to develop the in-house capability on the soils, plants, animals, and institutional arrangements in other countries--in the rest of the world, if you will.

Agricultural economists need a significantly different set of skills than most of them now possess. They need more training in macroeconomics and international trade, two areas of competency that very few of them have. We need capability on the politics of other countries, and on international relations. I could go on. I hope I have made my point.

Tapping the New Knowledge Being Generated in the Rest of the World. The agricultural research capability in the rest of the world has grown dramatically over the last 20 years. Much new knowledge is being generated on world agriculture in other countries. We need to forget the idea (rhetoric) that we are the technological leader in every area and that our perspective should be to share our technology rather than to obtain it from others. To preserve our own competitive position it is imperative that we tap into the new knowledge being generated elsewhere. This needs to be done systematically and effectively. We need a greatly expanded program of translation. We need collaborative relationships between U.S. and foreign institutions. We need many more exchanges of researchers.

Again, my list could go on. Our challenges are great.

CONCLUDING COMMENTS

U.S. agriculture and our economy as a whole have merged into an interdependent international economy. That very significant development should have changed in very significant ways our research agenda; it should have changed how we organize to do the research we need to do; and it should have changed how we finance our research. However, not much of any of these needed changes has occurred.

The challenges before us are great. We can either slumber along in self-complacency, believing that what we did in the past and how we did it is good enough for the future. Or we can get up on our toes and meet the challenges before us. To do that will require significant organizational innovations, significant retreading of old staff and staff development, and vastly different perspectives on our problems than we now have.

Above all, we can no longer have the luxury of parochialism--either in terms of our individual states and the nation as a whole, or in terms of our disciplinary capabilities. We need a vastly different window and perspective on the world.

