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ECONOMIC ISSUES FACING THE COLLEGE OF AGRICULTURE AND HOME ECONOMICS IN THE 1980's

by

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The planning committee asked me to identify the major economic issues facing our College in the 1980's and to discuss some of the impacts of these issues on programs of the college and for clientele we serve. The issues I've chosen to discuss are: (1) The World Food Situation and International Trade, (2) Energy, (3) U.S. Economic Growth and Inflation, and (4) Productivity and Research. On each issue I want to present some background information and then discuss implications.

There are many other economic issues that could be identified. I hope that the discussion period will be a time where some of you will identify issues which you see as being important to our College and lay out the implications for our programs. Also, I'm anxious to find out how you react to my ideas.

One of your first reactions to the list of issues may be that there is much more than economics involved. And I would fully agree. In my judgment there are few issues that are purely economic. Rather, I see economics as <u>one</u> of the subject matter components that needs to be considered in addressing most issues. Hence, the approach is to focus on the economic component of the issues identified with the understanding that economics is not the only relevant consideration and in some cases not necessarily the most important one.

A. The World Food Situation and International Trade

Let's start by looking at the world food situation. Today, the U.S. is more an interdependent part of the world economy than ever before. It is more dependent on other countries. It is more affected by the economic successes and failures of other countries and the economic policies promulgated by other countries. This is especially true for U.S. agriculture.

The world food situation is a delicate balance between demand for food and the production or supply of food. There are two major determinants of the demand for food, number of people and per captia income.

Population of this planet is growing in the neighborhood of 1.7-1.8 percent per year. In some developing countries population is growing at alarming rates. Death rates have fallen as modern medicine has been introduced. Birth rates remain high, hence, more people are surviving and we have the classic population explosion. In other developing and developed countries birth rates are falling and population is growing at a more moderate rate. Simultaneously, a number of developed countries are approaching zero population growth (ZPG).

Income, real per capita income, is growing in the developed countries of N. America, W. Europe, Japan and in some developing countries -- Korea, Phillipines, Thailand and Latin America. In fact, a 1% increase in income in developing countries generates a larger increase in demand for food than a 1% income increase in developed countries. For the world as a whole a 1% increase in real per capita income translates into an

increase in demand for food of around .7% per year. Overall then, population growth plus increasing income means an increase in demand for food of around 2.5% per year. Or, 25% more food will be needed by 1990.

Production of food is also increasing. While we have had at least two world food crises in the last two decades when Mother Nature was unkind, food production has grown from 2.5 to 3.0% per year for the world as a whole. Viewed on a per capita basis food production in the past 20 years increased 10-12%. This is a world wide average. It hides some tremendous differences. In the U.S., USSR and Eastern Europe per capita increases were about 30% for the 1960-1980 period; in Western Europe and East Asia about 20%; in Latin America 10%; in South Asia no change; and in Africa a 10-12% decrease.[1/]

As we enter the 1980's it appears that world food production is still increasing somewhat faster than demand. However, one bad crop year can easily precipitate another food crisis. During the 80's many expect demand for food to increase faster than supply. This means more competition for available food supplies. It means upward pressure on world food prices.

Where will the food be produced? The first point is that most food will have to be produced in-country, i.e., in each and every country around the world. Secondly, many industrialized countries will add to their food supplies by importing. They will trade cars, clothes, shoes, TV sets, and oil for food. An increasing number of developing countries will also trade to add to their food supplies. I find it very interesting

that Korea, clearly a developing country, has passed the billion dollar level in food imports from the U.S. Who will do the exporting? There are five major suppliers -- Canada, Australia, Brazil, Argentina and the U.S. But the U.S. is the single most important country with the capability to produce and export grain and food products. Currently the U.S. accounts for 53% of all world grain trade. Wally Barr expects that share to increase to 65% by 1990.[2/]

Implications --

(1) This picture presents a very positive situation for U.S. agriculture and generates important implications for clientele we serve and indirectly for our College. It suggests a strong underlying trend that should generate favorable prices and incomes for U.S. farmers and for the U.S. agribusiness sector. This does not mean prosperity year-in and year-out. It does project an expanding market opportunity and the definite possibility that the U.S. agricultural sector will grow faster than the rest of the economy.

(2) If agriculture is prosperous then the research and extension education efforts of our college will be more valuable. The return to dollars invested by the public in these programs will be greater. Also, a prosperous agriculture means a healthy demand for students interested in agriculture and employment with agri-businesses.

(3) Growth of the export market -- especially for soybeans food and feed grains may bring about significant changes

in production patterns in the U.S. For example, corn sells for 20-30¢ more per bushel in Ohio than in the Upper Mississippi Valley. Our location provides cheaper transportation to foreign markets out the St. Lawrence, down the Ohio River and by rail to East Coast ports. This could mean more corn and soybean production in Ohio and less production of fed beef, market hogs and even milk. If careful analysis confirms this line of reasoning then there are very important implications for farmers and agribusinesses and the investment strategies they should pursue over the next decade.

(4) Increased dependence of U.S. agriculture on the export market will further subject U.S. farmers and the agribusiness sector to the ups and downs of the demand for food around the world. Year to year changes will certainly occur because of the weather, resulting in large crops in some years and small crops in others. Almost as certain are changes brought about by policy decisions of individual governments. Farmers will be faced with greater price and income instability. One of the challenges facing our College is to help farmers develop ways and means to cope with instability.

(5) Increased demand for U.S. agricultural exports will place added pressure on our natural resources. As marginal lands are brought into production we will need to give more attention to tillage systems and conservation practices that control erosion and other forms of non-point source pollution.

(6) Let's turn now to a different set of implications. These implications derive from the needs of the developing world for highly trained people. John Mellor, Director of the International Food Policy Research Institute, refers to a requisite for growth in the agricultural sector. He says: "It has to be technological change, and research is the core of that. And the bulk of the research has to be done in the country where it is going to be applied. That takes a lot of highly trained people."[3/]

Training people is a central purpose of our universities and colleges of agriculture. We have the ability and the capacity to help train the future scientists, teachers and public officials of the developing world. We've also got substantial experience in helping to develop agricultural universities, research systems and extension systems. It is in these areas, absolutely basic to the discovery and diffusion of new knowledge, that we have a comparative advantage. Mellor points out that in the 1950's and 1960's we helped a lot of countries with training and institution building. But, he says: "We got discouraged with it because we said it was only trickling down. Those processes took 20 years or more to pay off. Is that so long in human history? It is because of that effort that a country like India can now talk in terms of being self-sufficient in food...."[3/]

Recently, international programs at U.S. universities have been in the doldrums. Funding has been down. Also, some of the emphasis in our technical assistance has

shifted away from research and the generation of new technology. Few U.S. professionals have been involved and very few young professionals have international experience. Our capacity in terms of experienced people is clearly much less today than 10 years ago.

Now it's not at all clear that we're going to have a major increase in funding for U.S. international programs. It does appear that there is a rebirth or at least a re-examination of the importance of training and institution building and the role of new technology as the engine that drives the development process. It seems highly likely that in the 1980's our College will face increased opportunities for involvement in international programs. I expect such opportunities to cut across the entire college including basic agriculture production technology, nutrition and use of natural resources.

B. Energy: Availability and Costs

The two most important dimensions of the U.S. energy problem in the 1980's are availability of liquid fuels and the cost of energy in any form.

Availability -- Wally Tyner characterizes the next 20 years as an energy transition from petroleum fuels to alternate energy sources.[4/] The list of alternate sources usually includes coal, oil shale, nuclear, solar and biomass. The biomass category covers such sources as wood, forage crops, grains and municipal solid wastes. Production of energy from any of these biomass sources will certainly have implications for our College and clientele groups with whom we work.

There is general agreement that the energy availability problem during the rest of this century is a liquid fuels problem. Total energy reserves in the U.S. are enormous. Most of it is coal, probably enough to last far into the future. Even with all this coal, today only about 19% of our energy consumption is from coal, 47% is from oil and natural gas liquids, 26% from natural gas and 4% nuclear. Almost 50% is consumed in liquid form, of which we import almost one-half. This dependence on imports for a full quarter of our total energy supply, with much of it coming from a turbulent Middle East, is at the heart of the national security question, i.e., availability.

What can be done to reduce dependence on foreign oil? In the 1980's conservation is probably the most important possibility with new energy sources next in line. A recent OTA report concludes that in the next five years the most important new source is likely to be alcohol produced from grain with greater use of wood, forage crops and municipal solid waste later in the 1980's. Syn-fuels from coal and oil shale[4/] are not likely to be important until late in the decade.

Cost of Energy -- Low cost energy aided and abetted the technological revolution on farms and in farm homes between 1940 and 1970. Cheap energy hastened the adoption of labor saving devices for the housewife, enhanced labor productivity in farm production, made the home a more comfortable place to live, and increased the mobility of people generally. Real energy prices actually decreased in the 1940's and 1950's. Since 1970 rapid increases in energy costs have squeezed family budgets and have caused dramatic increases in the price of

many farm inputs as well as increases in the costs of processing and transporting food products. By 1990 energy costs are expected to be at least double what they are today, in real terms.

Implications --

(1) The implications are many. One of the most important has to do with our life style, the cars we drive, the homes we live in, the leisure activities we pursue and where we live relative to where we work and seek recreation. Energy as a big budget item is so new that we've barely begun to see the adjustments people will make. It takes about 8 years to roll over the nation's stock of cars and 50 years to roll over the stock of houses. What if prices in the next 10-20 years double or triple in real terms, i.e., relative to other prices. I think that several units within our College must assist in identifying alternative life styles that require much less energy per day or per year. We need to identify and analyze alternatives including the positive and negative side effects.

(2) A second implication -- also of broad scope -- deals with the effect of high energy costs on agricultural production systems. For example, back in 1975 Norm Rask looked at the systems we use for growing corn. He then asked what would happen if energy prices doubled or tripled. Would we go back to corn/legume rotations or stay with continuous corn. Given the parameters of the study, he concluded that no major change would take place.

Does this conclusion still hold if prices increase four times, five times, or six times. These are magnitudes far beyond our imagination just a few years ago. Now I suggest we need to give serious consideration to change of such magnitudes and the vast array of implications for agriculture as we know it today.

(3) A straightforward implication is the need to conduct research to identify energy conserving practices and to develop energy conserving technology -- for farms, homes and businesses. These efforts should feed directly into a regular dissemination program of information on energy conservation.

(4) We need research on new energy sources. Production of energy on farms or the growing of feed stocks to produce energy represent new enterprises. Are they feasible? If so, then farmers will face the full range of production, management and marketing problems that confront the producer of any new product.

(5) The use of agricultural resources to produce energy will affect food prices and the production of other agriculture products. At the heart of this implication is the food-fuel trade off. We need to study what those impacts are likely to be and to estimate their magnitudes at different levels of world energy prices and under different assumptions with respect to U.S. national security policy.

C. U.S. Economic Growth and Inflation

Real GNP, a broad measure of economic growth, increased 3.8% per year in the 1950's, 4.6% per year in the 1960's and 3.4% in the 1970's. As we enter the 1980's we are in a recession and real GNP has actually decreased. Overall for the next 10 years we expect real GNP to increase, probably in the range of 1-3% per year. This is a smaller rate of growth than we've experienced in several decades.

Price increases in the 1950's as measured by the Consumer Price Index (CPI) averaged 2.3% per year, in the 1960's 3.1% per year and in the 1970's 10% per year. Projections for the 1980's fall in the range of 8-12% per year. At no time in the past 60 years have we experienced inflation rates this high for such a long period of time.

Bringing down the rate of inflation is a very painful process. It will take concerted action over a period of several years. There are no quick fixes. Perserverance, self-discipline, courage and sacrifice are descriptors of the national will needed to deal with our inflation problem. It would be easy to concluded that we no longer know what those words mean and that we have no stomach to set in place and live with the national, state and local policies to which those terms accurately apply.

There's another phenomena accompanying inflation that makes it tough to deal with. It's called expectations. If prices go up unexpectedly and then level off or come back down people don't expect inflation to continue and therefore they don't take action to try to protect themselves. However,

when prices rise 8-10% per year and continue to rise for several years, people expect inflation to continue and the actions they take to try to protect themselves complicate inflation problems. Examples include: cost of living escalators in wage contracts, product prices tied to a fixed level of parity, higher interest rates and a buy now/pay later attitude.

Implications --

(1) One of the most important implications is the impact of slow growth on budgets for higher education, research and extension. A slower rate of economic growth in the 1980's means a smaller rate of increase in public revenues. Tax increases in the 1980's are possible but the public mood is for lower public expenditures or, at least, a slower rate of growth of public expenditures. Competition for public revenues will be keen including minimal assistance to the unemployed and a military budget that seems likely to grow in real terms. In addition, past experience indicates that during periods of rapid inflation there is a low probability of maintaining the purchasing power of our budgets from appropriated sources. Therefore the most likely outcome for the early 1980's is a reduction in our budgets in real terms and the necessity to face the tough trade offs between salary levels, number of people, number of programs, and level of support resources.

(2) Earlier I suggested that farmers would face price and income instability generated by the nature of the world food market and the importance of the U.S. as the major supplier of food exports. Inflation adds to price and income uncertainty. Product prices and input prices will change at different rates depending upon the supply/demand situation in a given year. One of the implications of this likely situation is that farmers will place a high value on short term and long term outlook information. Similarly consumers will be faced with increasing food prices and they too will look to our college for food price outlook information and for understanding of what's happening and why it's happening.

D. Productivity and Research

The slower rate of real growth of the U.S. economy projected for the 1980's is directly related to a sharp slowdown in productivity growth. Barry Bosworth, Senior Fellow at the Brookings Institution writes: "Labor productivity within the private non-farm economy expanded at an average annual rate of 2.8 percent in the 1948-65 period, 2% between 1965 and 1973 and only 1% in the last five years. During 1979 it actually declined by 2 percent."5/

In the agricultural sector over the past 30 years productivity has been growing and at a rate which has generally been faster than in the non-farm economy. In recent years many agricultural economists and others have expressed concern about a slow down in agricultural productivity growth rates.

In a paper at the 1980 AAEA meetings, D. Gale Johnson from the University of Chicago stated that productivity growth rates for the 1950-1970 period, were almost the same as the average for the 1970's.[6/] First, I would simply observe that no one is suggesting that the rate of productivity growth in agriculture is increasing. Secondly, during the past decade investment in agricultural research has definitely declined and I belive that will lead to reduced productivity growth in the years ahead.

It seems that the case for investment in research needs to be pushed hard for the economy in general and for agriculture in particular. Incentives for the private sector to invest in research and development are probably best handled through our taxing policies. For several years now we've had investment credits to the private sector for the purchase of new plant and equipment. If we're concerned that more investment in research is needed, then why not provide investment credit for new dollars or additional dollars devoted to research and development.

The case for research in agriculture is compelling. Research is probably the most important factor contributing to productivity increases over time. And productivity increases are absolutely necessary if U.S. consumers are to spend only 17% of their disposable income on food -- the lowest in the world. Productivity improvement is necessary to capitalize on the opportunity to increase our foreign exchange earnings from food exports as well as to contribute to the world food situation.

A puzzling question is why we have continued to under-fund research in agriculture. Evenson, Waggoner and Ruttan in a Science article last September summarized studies estimating the annual rate of return on investment in agricultural research.[7] Annual rates of return on research for hybrid corn, poultry, wheat, cotton and tomato mechanization ranged from 20-90% per year. They also looked at rates of return to all agricultural research for different time periods. From 1868 to 1926 the analysis shows a 65% annual rate of return to all expenditures on agricultural research. For the period 1927 to 1950 they identified two kinds of agricultural research: technology oriented and science oriented. Technology oriented research yielded a 95% annual rate of return; science oriented research, a 110% rate of return. From 1948 to 1971 their results showed an annual rate of return to technology oriented research by region of the U.S., ranging from 93-130% and a return to science oriented research for the total U.S. of 45%. In addition, for the 1948-1971 period they estimated a 110% annual rate of return on investment in farm management and agriculture extension.

These are excellent results using criteria for investment in either the public or private sector. Why then do we continue to under invest? Evenson, et.al., suggests two causes.[7] First, the benefits to farmers spill over across state lines to those who do not pay for the research. This says that farmers in Ohio benefit from research done in Indiana, Michigan and Pennsylvania but they don't actually have to pay for it. Similarly research results obtained in Ohio benefit

farmers in other states. Part of the return goes elsewhere and farmers in Ohio don't see the total return and hence don't place as high a value on the dollars they invest or encourage to be invested in research.

Secondly, Evenson suggests that the benefits to consumers are partitioned into such small amounts that the individual consumer cannot make the connection. In other words the results of research represent savings of a few pennies each week on the grocery bill for year after year and for millions of consumers. Let me illustrate: at any point in time the savings are small enough, the connection between the lab bench and the meat counter is fuzzy enough, and the time lag is great enough that only the wife of the director of research will tell her husband at dinner: "Roy, do you know I saved 10¢ a pound today on this chicken we're eating because the poultry department at OARDC discovered a new crossbreed of broilers in 1965 that increased the conversion efficiency of grain into meat."

Implications --

(1) The case for research is strong. The case for agricultural research is well documented. We've got to sell the case and that's going to take some hard work, imagination and a helping hand by researchers and by recipients of research results. We must be willing to experiment with new approaches. We can't afford to put all our eggs in one basket.

I think the OARDC Support Committee is one of those experiments; one approach. It has potential and we need to support it. If we don't we'll never know how successful it might be.

The academic unit advising committees are another approach. I'll be the first to admit that we've not been successful in discussing research with our advisory committee, at least we don't think so. When our agenda has dealt with the undergraduate program, the graduate program and with extension activities, we've had meaningful dialogue. We've gotten useful ideas and suggestions. When the agenda deals with research, it's been a very different matter. I've concluded that we simply haven't learned how to effectively interact with our committee in the research area. I know some other departments have done better. I've also concluded that we must keep trying.

Let me draw a bit more on experience in my own department. When we started our advisory committee there was little enthusiasm from many of our faculty. There was some normal apprehension from those who had not previously worked with advisory committees. Experience has largely dissipated those initial concerns. But one that remains is the time and effort to prepare for and interact with the committee. It is an additional activity. It takes time and it's hard work, harder by far than some of our normal activities for which we're better trained and are simply more comfortable. Yet, we must do it. Not necessarily advisory committees. The experience with that approach has to be

evaluated on it's own merit. My point is that more of us must devote more time and effort in making the case to our clientele and to the public at large. This may mean that our efficiency in generating research results is reduced. Maybe the return on investment falls to 45% rather than 50%. We may well have to accept that reduction in efficiency in order to get the resources to generate results at all.

My focus here has been on research but the prescription is equally applicable for extension and higher education generally. We've got to do better at representing ourselves to the public at large. It's called selling our product.

(2) A second implication which I draw from the general funding picture is that we should explore new sources of funds or perhaps put more emphasis on sources we've only begun to tap. Let me suggest just one idea. Suppose that an investment credit for research and development were instituted in our federal tax law and that farm businesses as well as non-farm businesses were eligible to participate. The larger corporations including some agribusinesses could be expected to expand their research and development departments. But most farm businesses and many agri-business firms are too small to set up research operations. This could be a powerful incentive for these firms to channel additional support to agricultural research, and experiment stations across the country would be a natural recipient of many of these funds.

E. Summary

1. For U.S. agriculture the 1980's will be a period of favorable prices and incomes, not every year but the underlying trend should be positive.

   The export market for agricultural products will be vital to the health of agriculture. Trade policy will be as important as the weather. Agriculture will be a major contributor to foreign exchange earnings.

   Farm and agribusiness firms will face continued price and income instability generated in large part by our importance in the world food market and by inflation.

   The agribusiness sector should be a bright spot in the performance of the U.S. economy.

2. For consumers the 1980's will bring higher food prices in real terms, higher energy prices in real terms and slower growth in real income. It seems likely that our standard of living in the 1980's will improve but at a slower rate than in the past 30-40 years.

3. For our College the 1980's present two pictures or two views of a landscape that have to be blended together. The first is a picture of great need for our services, here in Ohio and in developing countries. We generate new knowledge and transmit it. Our contribution to increased productivity and improved quality of life is vital. The need for our services is as great as ever before.

Another part of this picture is our solid record of past performance. The high rate of return to public investments in research and extension programs is but one indicator.

The second picture brings into focus slow economic growth, inflation and the likelihood of decreases in real funding from traditional sources.

The key obviously is how we blend these two pictures or two views into the landscape of the 1980's. I expect that the blending will require some very difficult trade offs. The need to set priorities will be ever present. The blending process will be tricky. It will be easy to get discouraged or disgruntled. Hence, we'll need to remind ourselves that our services are needed and that we're building on a strong record.

In other words, in the 1980's it will be important to keep in perspective the several parts of the landscape before us and to proceed with the conviction that we're building cathedrals, not just chipping rocks!!

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