
**A Symposium Sponsored By
The Federal Reserve Bank of Kansas City**

COMPETING IN THE
WORLD MARKETPLACE:
THE CHALLENGE FOR
AMERICAN AGRICULTURE



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Kansas City, Missouri
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Contents

<i>Foreword</i>	<i>iv</i>
<i>The Contributors</i>	<i>v</i>
1. Trade and Agriculture: A Governor's Perspective, <i>Governor John Carlin</i>	1
2. The Imperative of Successful Competition, <i>Daniel G. Amstutz</i>	11
Commentary on 'The Imperative of Successful Competition: <i>Martin E. Abel</i>	21
3. Enhancing Competitiveness: Research and Technology in Agriculture, <i>Michael J. Phillips</i>	25
Commentary on 'Enhancing Competitiveness: Research and Technology in Agriculture: <i>John T. Marvel</i>	49
4. Enhancing Competitiveness: Infrastructure and Agriculture, <i>Ray A. Goldberg</i>	55
5. Enhancing Competitiveness: US Agricultural Policy, <i>Richard E. Lyng</i>	67
Commentary on 'Enhancing Competitiveness: U.S. Agricultural Policy: <i>Harold F. Breimyer</i>	77

6.	Enhancing Competitiveness: International Economic Policies, <i>Graham J.L. Avery</i>	81
	Commentary on 'Enhancing Competitiveness: International Economic Policies: <i>D. Gale Johnson</i>	107
7.	Enhancing Competitiveness: National Economic Policies, <i>Manuel H. Johnson</i>	113
	Commentary on "Enhancing Competitiveness: National Economic Policies: <i>Robert Z. Lawrence</i>	129
8.	The Challenge in Building Market Demand, <i>Dale E. Hathaway</i>	133
	Commentary on 'The Challenge in Building Market Demand: <i>Orville L. Freeman</i>	151
	Commentary on 'The Challenge in Building Market Demand: <i>Jerry M. Hiegel</i>	157
	Symposium Participants	163

Foreword

Competing in the world marketplace poses a serious and pressing challenge for American agriculture. In the 1970s, booming farm exports brought farm prosperity. But in the 1980s, stagnant world food demand and intense export competition contributed to great financial stress for farmers, lenders, and agribusinesses. American agriculture is now being forced to adjust to a new market reality.

How can American agriculture better compete in today's world food market? To provide some answers to that critical question, the Federal Reserve Bank of Kansas City sponsored a two-day symposium on 'Competing in the World Marketplace: The Challenge for American Agriculture.' The symposium was held in Kansas City, Missouri, on October 31 and November 1, 1985.

We hope the proceedings of this symposium will be of interest to all those wishing to learn more about the importance of effective U.S. competition in world agricultural markets.



Roger Guffey

Resident

Federal Reserve Bank of Kansas City

The Contributors

Martin E. Abel, President, Abel, Daft and Earley. Dr. Abel has been president of Abel, Daft and Earley since 1983. From 1977 to 1983 he was Senior Vice President of Schnittker Associates. During much of that period (1976 to 1979), he also served as a member of the Board on Agricultural and Renewable Resources of the National Research Council. Dr. Abel has held a number of professional positions in the international arena, including Professor of International and Agricultural Economics at the University of Minnesota, Program Advisor in Economics for the Ford Foundation in New Delhi, and Deputy Assistant Secretary of Agriculture for International Affairs with the U. S. Department of Agriculture.

Daniel G. Amstutz, Undersecretary of Agriculture for International Affairs and Commodity Programs, U. S. Department of Agriculture. Undersecretary of Agriculture for International Affairs and Commodity Programs since 1983, Daniel Amstutz is responsible for the activities of the Foreign Agricultural Service, the Agricultural Stabilization and Conservation Service, and the Office of International Cooperation and Development. Prior to joining the current administration, Mr. Amstutz was a general partner of Goldman, Sachs and Company of New York, where he developed and directed commodity activities from 1978 to 1983. Before that, he was associated with the Cargill organization for nearly 25 years.

Graham J. L. Avery, Counsellor, Commission of the European Communities. As a Counsellor in the European Commission in Brussels, Mr. Avery advises the Vice President on agricultural issues. From 1965 un-

til 1972, Mr. Avery was with Great Britain's Ministry of Agriculture, and participated in the negotiations for British entry to the EEC. In 1973, he joined the European Commission in Brussels, but returned to London in 1976 as Principal Private Secretary to two successive Ministers of Agriculture. Mr. Avery went back to the European Commission in 1977 and held posts in the Cabinet of the President and Commissioners for Agriculture. From 1981 to 1984, Mr. Avery was Head of the Division for Economic Affairs in the Commission's Directorate-General for Agriculture.

Harold F. Breimyer, Professor Emeritus, Department of Agricultural Economics, University of Missouri-Columbia. A member of the University of Missouri faculty since 1966, Dr. Breimyer has served as a professor of agricultural economics, extension economist, and Perry Foundation Professor of Agricultural Economics. Also during his tenure, he was president of the American Agricultural Economics Association (1968-69), worked with the Agency for International Development, and advised the national agricultural research institute of Spain. Dr. Breimyer retired as Professor Emeritus in 1984. Before joining the University of Missouri, Dr. Breimyer had a 30-year career as an economist with the U.S. Department of Agriculture. He is the author of various articles and **three** books on topics of agricultural economics.

John **Carlin**, Governor, State of Kansas. John Carlin is the 40th Governor of Kansas, and is now serving his second four-year term. Prior to becoming Governor in 1978, he served eight years in the Kansas House of Representatives where he was Minority Leader and then Speaker of the House. **As** both a legislator and Governor, **Carlin's** major interests have been agriculture, education, the environment, and economic development. Governor Carlin is immediate past Chairman of the National Governors' Association (NGA) and is currently a member of the NGA Executive Committee. The Governor is **past** Chairman of the NGA Committee on Agriculture and past Chairman of the Midwestern Governors' Conference.

Orville L. Freeman, Chairman, International Division, **Popham** and Haik. Mr. Freeman joined **Popham** and Haik **this** year as Chairman of their international division. From 1961 to 1968, Mr. Freeman served as secretary of Agriculture in the Kennedy and Johnson Administrations. From 1969 to 1970, Mr. Freeman was President of EDP Technology

International, Inc. Between 1970 and 1985, he served as President, Chief Executive Officer and finally Chairman of the Board of Directors of Business International Corporation. He is also a Director of **Grumman Corporation**, World Watch Institute, the Overseas Development Council, and the World Future Society. Mr. Freeman is a former three-term governor of Minnesota and the author of two books.

Ray A. Goldberg, Moffett Professor of Agriculture and Business, **Harvard University**. Appointed Moffett Professor in 1970, Dr. **Goldberg** has held numerous positions in agribusiness in addition to his academic activities. Among these are Director for Mid-America Foods Inc., Chairman of Agribusiness Associates, Inc., and Director for Pioneer Hi-Bred International, Inc. Dr. **Goldberg** has often served in a consulting and advisory capacity for governmental and private organizations with agricultural concerns, including the Agency for International Development, the U. S. Comptroller of the Currency, and the Center for National Policy. Dr. **Goldberg** is the author of numerous books and professional articles.

Dale E. Hathaway, Vice President, The Consultants International Group, Inc. Prior to assuming his current position at The Consultants International Group in 1981, Dr. **Hathaway** was Undersecretary of Agriculture for International Affairs and Commodity Programs in the Carter Administration. From 1977 to 1979, he was Assistant Secretary of Agriculture. Prior to his service at USDA, Dr. **Hathaway** was Director and Administrator of the International Food Policy Research Institute and, from 1972 to 1975, he was Program Advisor for the International Division of the Ford Foundation. Dr. **Hathaway** was Chairman of the Department of Agricultural Economics at Michigan State University from 1969 to 1972, having served the previous 11 years as a professor in that department.

Jerry M. **Hiegel**, Chairman of the Board and Chief Executive Officer, Oscar Mayer Foods Corporation. Jerry **Hiegel** has spent his entire business career with Oscar Mayer Foods Corp., beginning with a print shop assistantship in 1946. He moved into managerial ranks in 1954, and by 1970 had been promoted to Vice President of Marketing. In 1977 Mr. **Hiegel** became Oscar Mayer's President, and in 1980 he became Chief Executive Officer. He has been Chairman of the Board since 1984. Mr. **Hiegel** is also Executive Vice President of General Foods Corpora-

tion, Oscar Mayer's parent firm. From 1983 to 1985, he served on the President's Task Force in International Private Enterprise, and is currently the Chairman of the American Meat Institute.

D. Gale Johnson, Eliakim **Hastings** Distinguished Service Professor of Economics, University of Chicago. Dr. Johnson has served the University of Chicago in numerous ways during his long tenure there. He was provost of the university from 1975 to 1980, and Chairman of the Department of Economics from 1971 to 1975 and 1980 to 1984. He joined the economics faculty at Chicago in 1944, where he has also served as Dean of the Division of Social **Sciences**. In addition to his university service, Dr. Johnson has served as a consultant for the Tennessee Valley Authority, the Rand Corporation, and the Agency for International Development, and as the Agricultural Advisor to the Office of the President's Special Representative for Trade Negotiations. Dr. Johnson is also the author of numerous books and articles.

Manuel H. Johnson, Governor, Federal Reserve Board. Dr. Johnson is a newly appointed member of the Federal Reserve Board. He had been Assistant Secretary of the Treasury for Economic Policy since 1982, and before that he served as Acting Assistant Secretary and Deputy Assistant Secretary for Economic Policy. Since 1981 Dr. Johnson has played a major role in the formulation of economic policies in the Reagan Administration. He has been a primary Treasury and Administration spokesman on issues relating to Federal government fiscal and monetary policies.

Robert Z. Lawrence, Senior Fellow, Brookings Institution. A specialist in international economics, Dr. Lawrence joined the Brookings Institution in 1976. Along with his duties there, Dr. Lawrence has served as a consultant to the Federal Reserve Bank of New York and to the World Bank, a member of the Special Study on Economic Change by the Joint Economic Committee of the U. S. Congress, and on the Brookings' Panel on Economic Activity. He was a professorial lecturer at the School of Advanced International Studies at John **Hopkins** University for three years, and has published a number of papers, reviews, and economic essays.

Richard E. **Lyng**, Secretary of Agriculture, U.S. Department of Agriculture. In February 1986, Dr. **Lyng** was appointed Secretary of **Agricul-**

ture by President Reagan. Prior to that, he served as Deputy Secretary of the Department of Agriculture throughout the first Reagan term. During that time he also served as vice-chairman of the Commodity Credit Corporation, and as the President's emissary to the National Commission on Agricultural Trade and Export Policy. From 1976 to 1979, Dr. Lyng was President of the American Meat Institute. Prior to that, he served as Assistant Secretary of the U. S. Department of Agriculture from 1969 to 1973. From 1967 to 1973, Mr. Lyng was Director of the California State Department of Agriculture.

John T. Marvel, General Manager, Science and Technology for Europe/Africa, Monsanto Company. In 1985, Dr. Marvel moved to Brussels to head Monsanto's Division of Science and Technology for Europe and Africa. Dr. Marvel joined Monsanto's Agricultural Products Company in 1968 as a Senior Research Chemist, conducting research in pesticide synthesis and metabolism. In 1975, he was appointed Manager for Chemical Synthesis, and in 1978, Associate Director of Research. In recognition of his research on pesticides, he was named co-recipient of Monsanto Company's 1984 **Thomas/Hochwalt** Award for outstanding scientific contribution to society. Dr. Marvel is the author of 20 scientific papers in the areas of organic chemistry, spectroscopy, and pesticide metabolism.

Michael J. Phillips, Project Director, Food and Renewable Resources Program, Office of Technology Assessment, U. S. Congress. Dr. Phillips is director of food and agricultural studies conducted by the Office of Technology Assessment (OTA) for Congress. Before joining the staff at OTA, Dr. Phillips served as a policy staff economist in the U. S. Department of Agriculture, and in 1976 received the Department's Superior Service Award for research. Since joining OTA, Dr. Phillips has been responsible for numerous policy studies, and has written many articles on technology and public policy issues in agriculture.

Trade and Agriculture: A Governor's Perspective

Governor John Carlin

Several years ago, it would have been unusual and perhaps even out of place for a governor to be addressing a group on the topic of international trade. Trade was a federal issue. Governors dealt with matters inside their borders. Interregional, let alone international, perspectives were seldom of concern.

Today, however, we live in a competitive age with an international economy. Those of us in the states are deeply affected by trade decisions made both in Washington and in other world capitals. We can no longer afford to sit by and let those decisions be made without our input or our action. We may not be able to write trade policy, but we can help influence it by participating in the process and by unilaterally taking actions that accomplish something positive for our states.

We have a responsibility to remind federal policymakers that in a federal system the impact of national policies on states must be considered. As states have struggled with difficult economic times and revenue challenges, governors have become more vocal on national economic policy issues. One issue at the top of the list is trade.

We have found from personal experience that there are world markets to be opened and that we can open them. We can introduce other countries to the commodities, products, and services our states provide.

For example, during the past year alone, governors have led a record number of trade missions abroad. We have met with international leaders in our state capitals and we have heard from the Japanese ambassador to the United States, seven Canadian provincial premiers, and the

chairman of the Commission on Industrial Competitiveness at the National Governors' Association summer meeting.

But above and beyond all this activity, as a governor of a Midwestern state that is heavily dependent on agriculture for its livelihood, I have developed a growing concern about U.S. trade policy and the larger picture of the U.S. economy that it affects.

It is clear that agriculture is suffering because the budget deficit has helped produce not just high real interest rates but an overly strong dollar abroad, thus reducing our competitiveness as marketers of agricultural commodities. In another sense, it is suffering because of a trade policy that has not recognized the new demands of international competition and has victimized our economy as a result. And it is suffering because past mistakes, such as embargoes, have resulted in lost markets.

The bottom line is that we in the Midwest are still waiting for the elusive economic recovery others have experienced. But we are not just waiting, we are also seeking solutions to our economic woes. Insofar as the agricultural economy is concerned, increasing our exports is a marketing goal for us all and much is being done. While additional trade would influence commodity prices, it is not the only answer. That is basically the perspective I want to take as I address the topic of "Trade and Agriculture: A Governor's Perspective."

Specifically, I want to explore two areas. First, I want to examine the realities we must accept as we develop future trade policy. Second, I want to suggest actions that need to be taken at both the federal and state level to improve the agricultural economy and increase our share of world trade in this arena.

First, consider the realities. One of the most important realities we face in considering agricultural trade is that exports today are crucial to the overall well-being of the agricultural sector. We have geared up in that direction for years. Exports account for 25 percent of our agricultural output. One acre out of four of U.S. farmland currently produces for export. U.S. farmers feed millions, and not just in underdeveloped nations. The Japanese, for instance, import over 50 percent of the calories they consume, with 95 percent of soybean and 60 percent of wheat imports coming from the United States.

The result is that agricultural exports are not only vital to the agricultural economy as it is now structured but that grain exports in the past have offset the U.S. trade deficit by as much as one-third. It is also a reality, because of the internationalization of agriculture, that many

look to exports as the panacea for the recent economic crisis in the Farm Belt. But the truth is that it will not and cannot be the Midwest's salvation. There are other realities that prevent that from happening.

One of those facts of life is that we are experiencing a steady decline in markets, and there is little hope of recovering many that have been lost. In 1981, we had 61 percent of the share of total world agricultural markets. That figure has dipped to 50 percent. In wheat exports alone, we suffered a 36 percent loss of the market share between 1981 and 1985. While we used to count on one out of three kernels of grain being exported, that number is steadily being reduced. At the same time, our production has not been curtailed.

And while agricultural commodities once offset trade deficits as much as one-third, the steady decline in markets—at the same time our overall trade deficits have grown—has meant that the overall economy has suffered as agriculture has suffered. This is a reality too few understand, just as too few Americans fully appreciate the total contribution agriculture makes in terms of jobs, general economic activity, and consumer benefits.

But just as making that point clear is difficult, changing the downward trend will not be simple either. We cannot easily undersell our competitors as a way of buying prosperity for our country's farmers. For example, Argentina and Brazil have filled a gap created by our grain embargoes and a deficit-induced strong dollar abroad. Those countries have significant debts, and their agricultural exports are one of the primary means of securing hard cash to pay their debts. They cannot afford to be undersold.

Likewise, the European Community has invested heavily in agricultural export programs. We cannot expect them to make unilateral changes that allow us to jump in and reclaim markets they have assumed.

In fact, we must admit that our competitiveness as a world trading partner has been declining steadily in the aggregate for the past two decades. It is unrealistic to believe that our trade deficits and, in some cases, lower productivity than that of our trading partners are a result of their actions. We must assume some of the responsibility and seek solutions based on our past errors.

John Young, who chaired the President's Commission on Industrial Competitiveness, told the nation's governors in August that we are experiencing problems because international trade has not been a national priority. Until we take a comprehensive look at trade policy and

accept the fact that our unilateral trade actions hurt us, we will inflict damage that is irreparable.

For too long, those of us interested in agricultural trade have viewed the European Community as a trade enemy. But after visiting with representatives of the European Community while in Europe last month, I have come to realize they take a similar view of us.

While there, I had an opportunity to talk with Graham Avery, who will be on your program tomorrow, with Frans Andriessen, the Commissioner of Agriculture and Vice-President of the European Community, and with Jacques de Bohan, an agricultural cooperative leader in France. In those discussions, I learned there are many parallels between our agricultural sector and their agricultural sector. Both are sophisticated and tend to overproduce. Their subsidies are as important to maintaining their agriculture as our subsidies are in maintaining ours.

If trade is to make a positive contribution to this **nation's** economy, we must seek solutions based on realities. The bottom-line reality in terms of our competitors is that they are not going to go away. We have to find ways to share the world market more profitably. And that can be done only by taking a new approach to all U.S. trade policy. Because we have become less competitive, we have chosen to protect rather than to compete. It is time we get beyond the political rhetoric on both sides of the trading game and lay the cards on the table objectively and honestly.

So what specifically must we do? At the federal level, we must revamp our total trade policy with the notion that we are going to have to compete. Protectionism will not serve us in the long term.

We need to take a look at our organizational structure for developing trade policy and search for a better mechanism than the splintered approach we take now. This would benefit agricultural as well as overall trade.

We also need to look at trade legislation as well as the programs tied to it to make sure we remove obstacles that prevent our taking full opportunity to compete. This is important whether we are talking about export financing or better information about foreign markets.

The world economy is interdependent, and it is time we operated on the international scene with an acceptance of that fact.

The time is ripe. The pressure is growing in this country to do something about our trade deficit and our growing agricultural surpluses. At the same time, there is mounting concern in the European Commu-

nity, for example, about their costly agricultural programs and how much longer they can afford them. There is no doubt that dialogue rather than controls could profit both sides. And because we have mutual concerns, I believe we would profit more by working together than by casting aspersions each other's direction.

Likewise, the total trade policy impacts on each individual commodity or product. That is why **talk** of a free market for agriculture is nothing more than talk. When textile quotas with China affect wheat sales, there is no free market. And when Congress approaches trade policy from the perspective that 'you buy more from us or we will buy less from you,' there is no free market.

It is clear that a strong, comprehensive trade policy developed through international give and take can help agriculture, but that is not enough. We need a healthy agricultural economy so that development of future agricultural trade policy does not have to take place with the view that it must be the bailout strategy.

A healthy agricultural economy will not exist unless there is a significant reduction in the deficit. As long as the dollar remains overly strong, we cannot be competitive **with our** agricultural products. In fact, all export industries will benefit from deficit reduction. And their subsequent contributions to an improved economy will have a spill-over effect on agriculture.

Fortunately, there is a growing consensus that deficit reduction must be a top priority in Washington. John Young's commission made that point clear. The nation's governors have supported that policy position for the past two years. Even Secretary of Agriculture Block stated as much in a speech at the Kansas State Fair in September.

But despite that consensus, nothing seems to be happening. We elected a President in 1980 who campaigned on a balanced budget platform. Five years later, we have that administration asking for the debt ceiling to be raised to **\$2** trillion. That is hardly deficit reduction, much less a balanced budget.

We have a Congress that says it wants to balance the budget, but even the latest scheme to do so, the Gramm-Rudman Act, has target dates that will postpone most actions until after the 1986 elections. If that is the case, we are at least two years away from any kind of relief that will affect international markets. **U.S** agriculture cannot afford to wait that long.

In a sense, our failure to act on the deficit is another form of protectionism because our deficit affects international exchange rates. And

whether protectionist policies are overt or result from domestic fiscal policy, the result is the same—we are not enhancing our export position in the world.

The dollar is not the only issue regarding agricultural exports. Reliability is another. We need to remove agriculture to every extent possible from the arsenal of foreign policy weapons. As we have found from past experience, in both Republican and Democrat administrations, embargoes are not an effective tool. In fact, we have inflicted more damage on our farmers than we have on those we sought to reprimand.

And when we think about reliability as suppliers, we cannot limit our thinking to interruptions in supplies because of foreign policy decisions. We must also be concerned that our dependability is not impaired by our production methods. We need a farm policy that allows us to protect our soil and water resources and ensures that we will be a reliable supplier not just today but 30 or 40 years down the road.

The importance of this factor in trade became clear to me when I met with agricultural leaders in Japan, a country that relies heavily on our food exports. They were not worried as much about embargoes as they were that we were allowing our cropland to be damaged to the point we could not meet their future needs—a slant on soil and water conservation that we do not traditionally think of.

But regardless of what we do with agricultural trade or reliability factors, we cannot overlook the impact of overall farm policy on farmers' ability to compete and profit. If a farm policy is not framed to allow some stability for the producer, it will be difficult, if not impossible, to compete in the export markets.

For too long, our farm policy has been short term and often crisis oriented. Personally, I believe no farm program can work for a capital-intensive, export industry if it does not provide for stability and long-range planning capability. Under current practices, many programs simply do not have an opportunity to be effective before they are changed.

Agriculture is the only major industry that government does not allow to plan for its future. It used to be we had a four-year farm program, but as you know, in recent legislation—with the discretionary power given to the Secretary of Agriculture—we have had in essence a year-by-year policy. And the prospect for getting anything better out of the 1985 Farm Bill is fading rapidly.

We need to have a policy that allows for planning confidence. When General Motors invests to build an auto plant, executives do not have

to worry or wonder about reauthorization of federal industrial policy every one, three, or five years. Those executives have some degree of stability from government policy. They know, to some degree, what the chances are of making a profit on their investment. If they did not, we would not have had eight months of drama surrounding the Saturn plant decision. There might not have been a Saturn plant at all. Likewise, the oil industry does not have to sit around and wait for the oil depletion allowance to be renegotiated every four years.

But the farmer, at best, has to wait every four years for Congress to recreate the wheel—never knowing whether it will be a square wheel or round one—even though the previous model might have worked pretty well. The fact is that farmers cannot make sound economic decisions when there is no certainty in our policy. And over a period of time, this inability has ~~taken~~ its toll not only on agriculture but on agribusiness and this country's economy, and it will continue to take a toll.

Therefore, Congress must take the time to step back and look at the big picture of **agriculture** to determine what is best for all commodities, for agri-related businesses, for consumers, and for trading partners. The question, of course, is can it be done under our current system of developing farm policy? I say no.

That is why for the past two years I have been advocating a new approach to the development of farm policy that would establish a nonpartisan, broadbased commission to make recommendations. Such a commission has been recommended in the form of legislation in both houses of Congress. If such a commission becomes a reality, we stand a better chance of creating a climate in which long-term policy can be developed and in which the big picture of agriculture, including the export side, can be considered.

It is my belief that the development of a stable and reliable farm policy is one of the major contributions the federal government can make to improve our position in the international arena. Unless we have an agricultural sector that is healthy, we cannot take a realistic view of the role of trade in that sector.

As a footnote to what the federal government can do to improve agricultural trade, I would suggest that the federal government update the practices of the U.S. Department of Agriculture. We produce **high**-quality products and a wide variety of agricultural commodities. Unfortunately, we are not always successful in realizing the full potential of our production.

For example, a new variety of wheat, **ARKAN**, was developed in

Kansas. This variety combined the characteristics of hard red winter wheat and soft wheat for a more resilient, higher yielding product. The federal classification process, which utilizes visual classification, resulted in **ARKAN** sometimes being classified as a soft wheat, thereby reducing its value. The outdated and archaic federal inspection process has, in this case, hampered our farmers' ability to benefit from technological advances. In fact, such federal policies have inhibited our sales potential abroad.

Another significant problem is our apparent inability to deliver the quality of product our customers thought they were purchasing. Buying teams from countries throughout the world have told me that the product delivered was not the product they paid for.

Some say the problem is with the federal grading process. Others say it is a misunderstanding with buyers. Regardless of who is causing the problem, we must do all we can to correct it because the rule in all commerce is 'the customer is right.' In this time of intense competition for agricultural trade, we cannot afford to be lax in our concerns for customer satisfaction.

Further, there should be a concerted effort to actively promote our agricultural products abroad. While we have often concentrated on grain sales, there are other commodities that can be introduced to our trading partners if properly promoted. The concept of "value-added" products gives us the opportunity to export our labor value as well as our product value. The fact is, we can market our finished or processed products as effectively as our raw commodities if we give priority to such an approach. The time is right for the federal government to become active in more than grain and flour deals and begin promoting crackers and corn chips.

Additionally, because we have competition, we can no longer expect foreign buyers to come to us. We have to be more aggressive in marketing our products. Times have changed, and unless our promotion strategies change with them, we will be left further and further behind. Those statistics I cited previously about our lost markets will only continue to become worse.

As we become more aggressive as exporters, states will play a more active role on the international trade scene. Today, there are many avenues open to states for involvement. For instance, states must take advantage of their land grant products, for it is true that the promotion of value-added products can begin at the state level even easier than at the federal level. Research can ensure that we continue to maintain quality

products for export.

A relatively new idea is enhancement of trade through state export-financing programs that provide incentives for local producers to become involved in trade. Cooperation between agriculture and economic development departments in the states can make this type of system more effective.

Along with financial support, those new to the international trade arena need education programs to learn how to become active exporters. Here, governors and state government can play a significant role.

We can also play a major role in export promotion. We are integral to opening doors with potential trade partners by participating in trade missions and indicating state support for private sector endeavors. Governors can gain entrance to chambers that business representatives often cannot enter on their own.

Cooperation is the key, and governors can be the catalyst in coordinating the efforts of the research community, businesses, and state government in developing products for trade and in promoting them.

Trade is no longer the exclusive province of the federal government. Just as there must be cooperation by those within a state to make the system work, there must be cooperation between the federal and state levels. As I said at the outset, governors are becoming more vocal on fiscal and trade issues. And unless they continue to do so, the types of suggestions I have made today will not reach the corridors of Congress where action must take place.

This country does not need to be at a competitive disadvantage in the world. As I was told by a Japanese businessman at an economic development conference last week, the United States has some natural trading advantages that our competitors do not have. We have an abundance of land, water, air, and minerals—the raw materials of production—as well as relatively inexpensive utilities to enable us to produce. We have excellent research facilities both in our universities and in the private sector. We have a stable governmental system. In short, we are still a land of opportunity.

What we do not have is a policy either for trade or for agriculture that allows us to take advantage of our natural competitive edge. Part of our problem is attitudinal—we produced superior products for so long that we are unaccustomed to being challenged. We have not adapted to the changing needs and demands in the countries where we do business. We have not looked to see what we can do to tailor prod-

ucts to their needs. Instead, we have tried to get our trading partners to adjust to what we are producing. That approach simply will not work today.

If we are again to be successful as exporters, we must accept the fact that change is inevitable. We should take a serious look at recommendations made by such groups as the President's Commission on Industrial Competitiveness. We must acknowledge, as this program does today, that both the federal and state governments have a role to play in international trade. And where agriculture is concerned specifically, we must be realistic about the limitations trade will play in solving our financial crisis.

This country still has the seeds for greatness. But those seeds can be nurtured only if we accept the harsh realities of the climate in which they must grow and develop a means for them to adapt to the climate. They can be nurtured only if we apply the proper mix of policies that allow us to be competitive. There are no quick fixes. Just as we cannot rush a crop, we cannot expect overnight solutions. We must take actions today that are farsighted.

We can restore our agricultural trade and reduce our balance-of-trade deficit overall if we acknowledge that the economy in which we operate is now a world economy and act accordingly.

I want to believe that we will find the leadership from individuals, such as those of you present today, to act on those realities. It is important for the future of U.S. agriculture that we find a way to be competitive. It is even more important for our nation's economy that we once again become competitors.

The Imperative of Successful Competition

Daniel G. Amstutz

It is an accepted fact that international markets are necessary to the well-being of U.S. agriculture. The importance of our agricultural base in this country is underlined by the fact that the food and agricultural complex accounts for about one-fifth of our gross national product, with assets exceeding \$1 trillion. It is also the nation's largest employer, providing **23** million jobs, most of them off the farm.

The role of exports in U.S. agriculture — and the nation — is crucial. About one out of every three harvested acres goes to foreign markets around the globe and farmers in recent years have looked to exports for up to one-fourth of their marketing income.

We are fast reaching a point where we need only **50 percent** of our agricultural resources to feed and clothe ourselves. Of necessity, we have increasingly turned to foreign markets as outlets for the remaining production.

Farming has become a business of life as much as a way of life, and today one American farmer produces enough food to feed 77 people. Similar changes in agriculture have been taking place to one extent or another in most of the world. Today, in the developed **countries** — when they have the arable land — farmers can produce much more than they consume.

The implications of increased productivity

Virtually everywhere in the world, farmers have more production potential and more incentive to use it. New developments in production technology, aided by genetic engineering, mean that **record-shattering** increases in production may be the norm rather than the exception.

- Chinese farmers are producing record crops of wheat, coarse grains, rice, oilseeds, and cotton.
- New winter barley varieties have added a million tons a year to British cereal production.
- Encouraged by artificially high wheat prices, the Saudis are literally turning the desert green, setting a world record for generating a wheat surplus.

Potential new uses for agricultural products are being discovered almost daily. What were once weeds are now processed into sophisticated pharmaceuticals. Waste products are now animal feed.

Because farmers can produce in surplus, people have been freed from the quest for food and can devote their energies to other pursuits. This abundance is a blessing, but it is also a problem—to the farmer and to government. We cannot seem to agree on what to do about it, and that has become a global issue.

What happens to farmers in Country A quickly affects Country B and Countries C, D, and E to one degree or another. Domestic farm policy has global implications. Someone said that if a farmer in North Dakota sneezes, a farmer in India catches a cold.

I think most nations share the same goals for farmers—a stable income with a fair return for their labor and investment. We all want for our countries an assured, dependable food supply achieved as efficiently as possible.

Where we differ is on how to reach these goals.

Different approaches to agricultural policy

The European Community (EC) uses the Common Agricultural Policy (CAP), which was put in place some 25 years ago. The CAP provides high domestic price supports that are protected for the most part by variable levies on farm imports. The CAP has been more than successful in meeting its goal of helping the Community achieve food self-sufficiency. Once a net importer, the EC has become a huge net exporter of a number of agricultural items.

In Japan, where agricultural land is limited, the policy is to maximize self-sufficiency by maintaining farm income at levels equal to those of urban workers, and to develop secure offshore sources to meet food requirements that cannot be met with domestic production. The United States has employed an ineffective supply management approach.

Whatever the country—the United States, Japan, Brazil, the European Community, Canada, Australia—each has its own system for providing its people with the most reliable food supply based on a sound farm economy. Given the global nature of agriculture, the international effects of these systems are a matter of growing concern. This was not the case in the 1970s, when world trade was increasing at a 15 percent annual rate. It is now clear that domestic farm programs and international agricultural trade policies require greater coordination if we are to achieve greater worldwide agricultural trade liberalization.

Can the United States compete?

Some argue that U.S. agricultural exports have fallen because the United States has lost its ability to compete and its comparative advantage. If we are to have a coherent discussion of competition and comparative advantage, we must first define our terms. First of all, comparative advantage is not the same as competitiveness. A country can experience a loss in competitiveness, while retaining its comparative advantage. A country can be competitive without having a comparative advantage.

The U.S. comparative advantage

Comparative advantage is a statement about the pattern of trade that would arise between countries in the absence of market distortions. A country with abundant natural resources, a high level of agricultural technology, and skilled agricultural management may have more comparative advantage in its agricultural production than in its production of industrial goods.

Such a country will tend to excel in the production of agricultural commodities, which can then be traded to some other country enjoying a comparative advantage in industry. Consumers in both countries will be better off because resources are used efficiently and the two countries can produce more in total than if each attempted to be self-sufficient.

Compared with other countries, the United States during 1970–81 became relatively more efficient in the production of agricultural goods. We increased our agricultural output per unit of input more than the rest of the world. So, with regard to unit costs, it would appear that the United States gained an advantage over other countries during that period. For example, the average productivity of land in the United States increased 43 percent, compared with 22 percent in the

rest of the world.

Just as significant, the **U.S.** agricultural sector has increased its productivity relative to the rest of the **U.S.** economy. This comparison indicates agriculture should clearly be one of our most dynamic growth sectors.

U.S. competitiveness

Competitiveness in the world marketplace is determined not only by comparative advantage but also by government policies relating to farm programs and trade. An export subsidy or price support policy can turn a country that does not have a comparative advantage over other countries in production into a country that has a competitive advantage in exporting.

Movements in exchange rates can affect foreign purchase prices, thereby changing export levels of a relatively efficient country. Thus, concepts of comparative advantage and competitiveness are not always linked due to market distortions caused by government intervention and the effects of macroeconomic policies.

U.S. farmers have a comparative advantage. **U.S.** farms, compared with other farms in the world, are well equipped, well managed, more efficient in size, and better located on larger expanses of fertile soil with a dependable climate. They also are run by profit-oriented farmers backed by extensive research and agribusiness services.

While the United States still has an underlying comparative advantage, several factors have inhibited our competitive ability in world markets.

The shrinking pie—A decline in agricultural trade

The rapid acceleration in world agricultural trade and **U.S.** exports from the late 1970s until 1980–81 was a phenomenon—an aberration. Those were unusual times triggered by unusual circumstances, the combination of which is not likely to be repeated. It was a boom time and the world was caught up in it. It was caused by:

- A lack of supplies available in other exporting countries and short crops elsewhere.—World food shortages brought on by drought, reduced fish supplies, and other food problems made our bargain prices even more desirable.
- An inflationary mentality that led to a credit binge. Buyers were willing to extend themselves in credit obligations without regard to

the real meaning of the debt service load. They made a bet that continuing inflation would ease their debt servicing burden. And credit was fully available, albeit at high rates of interest.

- A burst in buying power. The OPEC oil boom fueled a lot of buying. Even non-OPEC Third World countries, strengthened by loans from OPEC nations, were shopping in the U.S. market.
- A low U.S. dollar relative to other major currencies because of high U.S. rates of inflation at the time.

The bottom dropped out of this market in the early 1980s. Demand for oil fell. OPEC countries tightened their belts and closed their wallets. Some even borrowed money. The U.S. dollar rose to historic highs as we began to slow our inflation rate and yields and production increased in other countries.

Now the phenomenon is over. The current world picture whereby production is growing faster than consumption and consumption is growing faster than trade is not an aberration. After more than a decade of a boom cycle, agriculture—both here and abroad—has serious economic problems. Total world trade in agricultural products has declined during the past five years. The reasons are well known:

- Reduced world import demand because of rising production in countries that had been traditional 'importers.'
- Diminishing buying power. For example, the OPEC bust greatly reduced the buying power in some Third World countries.
- The debt loads of many developing countries and their reluctance to shoulder more debt servicing burdens.

But U.S. exports have declined faster and further than those of the rest of the world. Since 1980, our annual wheat exports have declined 2 million tons while the rest of the world increased its annual exports by 20 million tons. The United States now accounts for 34 percent of world trade in wheat, down from 43 percent in 1980. Our feed grain exports have dropped 12 million tons while the rest of the world increased its exports 6 million tons. U.S. exports of feed grains have dropped from 59 percent of world trade in those commodities in 1980 to 51 percent. U.S. soybean exports have fallen by 3.5 million tons while the rest of the world increased its shipments by 2.5 million. The U.S. share of world soybean trade has dropped from 78 percent to 66 percent.

The big question is why? Some answers include:

- Unrealistically high production incentives that create overproduction, too much supply relative to demand realities. U.S. farm programs have indeed influenced our price competitiveness in world markets.
- Unfair trade practices by our competitors — and some customers.
- Appreciation of the U.S. dollar against currencies of competitor nations.
- Lack of buying power in much of the world.

Many of the factors behind the slump are interrelated. For example, global demand for agricultural imports in recent years fell because of the global recession and the debt problems of some major importing countries.

A reduction in world import demand alone can change the market shares of various exporters, because exporters do not all react the same way to a change in world market prices. Generally, exporting countries with high and rigid price supports and large domestic use relative to exports will be faced with more rapid changes in exports than countries that have low flexible supports that depend heavily on world markets. This partially explains both the rapid growth in U.S. exports in the 1970s and the drop in recent years.

The effect of a strong dollar

Many people are quick to blame all of our export problems on the strength of the U.S. dollar, but in my view its effects are often considerably exaggerated. It is true that a stronger dollar relative to the currencies of importing nations has increased the price of U.S. commodities in the importer's currency. This was particularly evident in the case of U.S. soybean sales to Europe, where inflation was relatively the same as in the United States and imports of soybeans were not affected by duties. The real cost to importers rose 35 percent because of the dollar.

However, in the case of wheat exports, the appreciation of the dollar has been less important to importers, mostly developing countries, because inflation in those countries has more than offset changes in the exchange rate. Consequently, their real costs have actually fallen by about 17 percent since 1979. In other words, the dollar's impact on U.S. exports varies, depending on circumstances in different markets and regions.

Inflexible U.S. farm programs

The strength of the dollar is not the only problem. Our inflexible domestic farm programs make it impossible for U.S. prices to adjust to world market conditions, and we become less and less competitive.

The U.S. price support programs set a floor under domestic and world market prices for wheat, coarse grains, soybeans, cotton, and rice. Ordinarily, when prices fall to the U.S. loan rate, sufficient quantities are withdrawn from the export market to support world prices at our loan rate. The United States absorbs excess stocks by taking grain under loan.

When stocks become excessive, acreage reduction programs are implemented for U.S. farmers. Thus, the United States reduces world market price risks and bears the burden of stock and production adjustments, all at no cost to **producers** or taxpayers in other countries.

At present, the markets are so weak and surplus stocks outside the United States so large that competitor supplies have driven effective world prices well below U.S. loan rates, making the United States uncompetitive. **In effect**, the U.S. loan program operates as an export tax—and a fairly hefty tax at that. Since 1979, loan prices have increased 26 percent for wheat, **38** percent for corn, and 40 percent for cotton. These support price increases—or export taxes, if you **will**—have prescribed a protective price umbrella under which our competitors have expanded production and market shares. The appreciation in the value of the U.S. dollar has simply enlarged the size of the umbrella. In short, U.S. farm programs and loan rates send far more important signals to competitors and importers than does the value of the dollar.

Our price support system provides competitors with price protection that they can get no other way—and it gives them a clear edge in the international marketplace. To the extent that other countries can produce and sell at less than the U.S. loan rate, they have clear sailing in world markets—and they are taking full advantage of the opportunities we are giving them. Production in other exporting countries, and even in many importing countries, has jumped sharply in response to the world price floors given to them by the United States.

While we have been trying to hold down output with government farm programs, the rest of the world has increased its output. Consider these changes since 1980:

- U.S. wheat production is up 6 million tons, but production in the

rest of the world is up 65 million tons.

- U.S. soybean production is up about 2 million tons, but production in the rest of the world is up 8 million tons.
- U.S. cotton production is up 2 million bales, but production in the rest of the world is up 19 million bales.
- U.S. feed grain production is up **39** million tons (with one-third of it in carryover stocks) but the rest of the world has increased its feed grain output **36** million tons (with carryover stocks 15 percent).

Although utilization has continued to increase, production has increased faster.

The fallacy of our supply management approach is that we have controlled the resources (acres) employed, but we have not controlled marketings. As long as technological improvements in agricultural productivity continue, supply management programs without marketing controls are a farce, and doomed to fail.

The impact of foreign trade policies

The policies of other countries in their conduct of trade also have affected our competitive stance in world markets. Competitors use pricing and export marketing policies that affect their competitive positions relative to the United States.

Among competitors, the policies of the EC have had the most significant impact on reducing U.S. wheat and corn exports and reducing world prices of these commodities. High, protected supports generate surplus that is exported by subsidies, changing the EC from a net importer to a net exporter.

Sugar is a prime example. EC policies that encourage sugar production and export of the surplus by using subsidies have contributed to sugar oversupplies and depressed world prices. This has been particularly damaging to developing countries that depend on sugar exports to earn much of their foreign exchange.

In general, the export subsidy policies of the EC have distorted trade and propelled the EC to the front rank in the export of several major commodities and near the front rank in others. There are other examples, that add to the list of trade distorting policies, including policies promulgated by other countries' marketing monopolies.

Trade practices and market access

The U.S. goal in trade policy is twofold: trade practices that are uni-

form and fair—this is the export subsidy issue—and market access.

Improved access to foreign markets for U.S. agricultural producers and exporters has been one of our basic and long-standing goals. Typically, U.S. agricultural exporters are eager to compete in world markets. They seek only the opportunity to compete on an equal basis with other suppliers. But the problems of market access are many and familiar—the EC's variable import levies and Japan's import quotas are only a few of the multitude of border controls that impair the international movement of agricultural goods.

While important gains have been made in past trade negotiations, tariff and non-tariff barriers remain a major impediment. We have strengthened our efforts to reduce these barriers and can report limited but significant success, particularly in pressing the Japanese to open their market more fully to our farm and forest products.

To regain our competitive position, the United States must restructure its domestic programs. Otherwise, we must be prepared for larger and larger production cutbacks and fewer and fewer exports.

Greater market orientation, including market-oriented loan rates whereby the government provides a safety net, not a market, is critical to strengthening U.S. competitiveness in world markets. In August 1985, the U.S. rice price was 105 percent higher than that of our competitors. Our wheat price was 30 percent higher. Cotton was higher by 19 percent, corn by 17 percent, and soybeans by 7 percent.

The Congress is determining what our legislated agricultural policy will be in the years ahead. We hope for the best.

As we in the United States work toward a long-term solution to make us again more competitive, a rise in protectionist sentiment here at home has forced us to begin an export enhancement program that we would not have freely chosen. We have made up to \$2 billion in surplus commodities available to expand U.S. agricultural exports in selected markets, particularly those characterized by unfair trading practices by other exporting countries. We hope the export enhancement program will encourage meaningful trade talks so that fair trade practices will be the rule and not the exception.

Conclusion

The phenomenon of the rapid growth of export markets in the 1970s created distortion in government policy and private investment. The correction we have witnessed in recent years was unavoidable because of these distortions. But U.S. exports can grow steadily, at a rea-

sonable rate, if we adopt sound farm programs and persevere in our ongoing efforts to negotiate fair trading rules among nations.

Global demand for food and fiber will continue to expand. The world's population is expected to grow at the rate of more than 80 million people per year. If comparative advantage is permitted to work, these people will be fed and clothed effectively and **U.S.** farmers that produce efficiently will benefit. On the other hand, if comparative advantage is not permitted to work, distortions in competition will remain a chronic problem and real peace and stability around the world will continue to elude us.

Commentary on "The Imperative of Successful Competition"

Martin E. Abel

Undersecretary Amstutz has provided a good description of how the United States got into its currently depressed agricultural export situation. He stresses heavily the need for the United States to become more competitive in world markets and argues that doing so will require more market-oriented domestic programs. Negotiating fair trading rules is also important in his view. If these two things are done, U.S. exports will grow.

This is a very benign conclusion that tells us nothing about the nature and magnitude of the problems facing American agriculture and the government officials with responsibility for implementing agricultural policies and programs. It is this set of issues I want to address.

My basic thesis is that becoming more competitive in world markets is a necessary but not sufficient condition for eliminating surplus production capacity within the next five years. U.S. surplus capacity is huge and consists of two parts. One is the visible surplus in the form of large stocks, projected to be nearly as large or larger for most commodities at the end of the 1985-86 season than at the end of 1982-83 (pre-PIK year). The other is our ability to produce much more every year than we can use at home or export.

I have projected to the end of the decade planted acreage required for major crops under the following "optimistic" assumptions:

- Normal weather and growing conditions around the world.
- World agricultural trade growth at slightly less than one-half the rate in the 1970s, compared with declining trade during the first half of the 1980s.

- The United States, following policies that make it fully competitive in world markets and our regaining our past share of these markets by the end of the decade.
- The rate of growth in crop yields being generally only one-half the historic rate.
- Stocks of major commodities being gradually reduced from currently large levels to desired levels by the end of the decade.

The results of these assumptions are fairly impressive. U.S. agricultural exports would grow at annual rates about the same or even faster as those in the 1970s through a combination of regaining market share and modest growth in world trade. Between 1985-86 and 1989-90, for example, wheat exports would increase from 1,050 to 1,605 million bushels, or by 11 percent a year. Corn exports would increase from 1,625 to 2,240 million bushels, or by about 8 percent a year. Soybean exports would increase from 675 to 925 million bushels, or by 8 percent a year. And cotton exports would increase from 3.5 to 7.2 million bales, or by nearly 20 percent a year.

Equally impressive is that this robust export growth would still leave the United States with substantial excess production capacity by the end of the decade. In 1981, a record 376 million acres were planted in all major crops. The required plantings in 1986 under our projection scenario would be 322 million acres, 54 million acres below peak plantings and 2 million acres below 1983, the year of the PIK program. By 1989, required plantings would increase to 353 million acres but would still be 23 million acres below the peak level of 1981 (Table 1).

TABLE 1
Area Planted Scenario
(In Million Acres)

	Actual				Projected				
	1981	1982	1983	1984	1985	1986	1987	1988	1989
Corn	84.2	81.9	60.2	80.4	83.2	72.0	74.7	76.4	77.3
Sorghum	16.0	16.0	11.9	17.2	17.8	14.1	15.8	16.0	16.2
Oats	13.7	14.0	20.3	12.4	13.1	12.0	12.6	12.7	12.7
Barley	14.3	9.5	10.4	11.9	13.1	10.4	10.3	10.4	10.5
Wheat	88.9	86.2	76.4	79.2	75.8	71.5	73.7	77.9	79.3
Soybeans	67.8	70.9	63.8	67.7	63.3	58.3	63.7	67.5	71.3
Cotton	14.3	11.3	7.9	11.1	10.8	8.4	8.6	9.2	9.8
Rice	3.8	3.3	2.2	2.8	2.5	2.3	2.4	2.5	2.6
Other*	73.0	73.5	70.9	74.1	72.1	73.0	73.0	73.0	73.0
Total	376.0	366.6	324.0	356.8	351.7	322.0	334.8	345.6	352.7

*Flaxseed, peanuts, sunflower, dry edible beans, potatoes, sweet potatoes, and sugar beets: harvested acreage for rye, hay, tobacco, and sugar cane.

If the assumptions are too optimistic, which I suspect they are, the excess capacity problem is larger than I have projected.

Becoming more price competitive in world markets and regaining our fair share of these markets, however desirable, are weak tools for solving our surplus problems. Price competition will affect output in countries where prices are directly linked to world markets, as for example, Canada, Australia, and Argentina. However, the behavior of many major producing and consuming regions of the world is not influenced by world prices. For example, Secretary Amstutz points out that while wheat production in the United States declined between 1980 and 1984, production in the rest of the world increased by 65 million metric tons. It is noteworthy that China, India, and the European Community account for all of this increase. Furthermore, it is doubtful that wheat production and consumption in these areas will be responsive to world prices in the foreseeable future.

The fundamental problem facing U.S. agricultural exports is slow growth in world trade. Secretary Amstutz has discussed the reasons for it. The potential for trade growth lies mainly with the developing countries. The United States can do two things to speed growth and development in poor nations and U.S. agricultural exports to them.

One is to use our economic assistance and agricultural export programs more effectively. Rather than promoting individual export programs, U.S. assistance should be packaged to meet the developmental and financial needs of individual developing countries. The numerous agricultural export programs at our disposal need to have a stronger economic development focus that will help build markets for the future. This approach involves a great deal more coordination among U.S. foreign assistance and export programs than now exists.

The other imperative for the United States is to keep our markets open to exports from developing countries. Secretary Amstutz has stressed the importance of comparative advantage in trade. Our comparative advantage lies mainly in the production and export of basic food and feedstuffs, such as wheat, coarse grains, and soybeans. The developing countries have a comparative advantage in producing other agricultural products and a variety of manufactured goods. Overall, it is harmful to our agriculture when the United States restricts imports from developing countries, such as sugar and textiles. We are on weak ground when we ask other countries to be less protectionistic while we continue to protect many of our own markets from import competition.

When all is said and done, the United States will have to control production of major crops for a number of years to avoid raising havoc with either the budget costs of farm programs or the financial condition of farmers and the businesses that serve them. A measured approach is in order, an approach that provides as much policy and program certainty as possible to help people plan for the future. Crash programs to deal with a long-term problem should be avoided. These approaches usually end up being counterproductive, undermining our competitive position in world markets when we reduce output too much, as we did in 1983. On the other hand, allowing stocks to increase further also has a high price and is also to be avoided.

In summary, becoming price competitive is important. But it is also of great importance to the United States to figure out how to use our agricultural resources and economic assistance to stimulate world economic growth, especially in developing countries, and world agricultural trade.

Enhancing Competitiveness: Research and Technology in Agriculture

Michael J. Phillips

Technology has made **U.S.** agriculture one of the most productive and competitive industries in the world. In doing so, agriculture has gone through major technological eras. The mechanical era of 1920–1950 made the transition from horsepower to mechanical power and greatly increased the productive capacity of U.S. agriculture. The chemical era of 1950–1980 increased productivity by reducing the constraint on production caused by pests and disease. Today, American agriculture is now entering a new major technological thrust—the **bio**-technology and information technology era. The implications of this new era could be **more** profound than either the mechanical or chemical technological eras.

The biotechnology and information technology era has been fostered by substantially expanded private sector investment in agricultural research complemented by increased public sector emphasis on basic research. The output of this new era is in its infancy but can be expected to have a great impact over the next three decades. This paper will focus mainly on the advances in biotechnology for agriculture. However, information technology will be very important to the successful application of biotechnology advances. Biotechnology will require greater managerial capabilities than for past technologies and information technology—the use of computers and electronic based technologies for management—will be extremely important in improving the management of agricultural production and marketing.

This paper focuses on biotechnology advances and their implications for U.S. agriculture. The paper defines the specific promising areas of biotechnology for agriculture, determines its impact on production of some important agricultural commodities, discusses the

environment in which biotechnology is being conducted, indicates the comparative position of the United States to Japan and Western Europe in biotechnology research for agriculture, and identifies factors important to international competitiveness in biotechnology research.

Biotechnology in agriculture

In the past decade, dramatic new developments in the ability to select and manipulate genetic material have sparked unprecedented interest in the industrial uses of living organisms. Following the first successful directed insertion of foreign deoxyribonucleic acid (**DNA**) in a host microorganism in 1973, scientific researchers in the United States and other countries began to recognize the potential for directing the cellular machinery to develop new and improved products and processes in a wide variety of industrial sectors—including the improvement of agricultural products.

Biotechnology, broadly defined, includes any technique that uses living organisms to make or modify products, to improve plants or animals, or to develop microorganisms for specific uses. It focuses on the use of recombinant **DNA** and cell fusion, which are powerful techniques that allow a large amount of control over biological systems. What scientists will now be able to accomplish through the use of molecular genetic techniques is awesome. Using these techniques, scientists possess the ability to visualize the gene—to isolate, clone, and study the structure of a single gene and its relationships to the processes of living things.

Within the last decade, major advances have been made in two important areas of biological research that have spurred the advance of biotechnology in agriculture. The first is the understanding of the gene's function and architecture at the molecular level. Powerful methods have been developed for identifying, isolating, and joining specific **DNA** segments as well as for determining and modifying their sequences. These methods, which provide the basis for recombinant **DNA** technology, have been used for several years for manipulating genes and producing valuable proteins in such microorganisms as bacteria and yeast. Only recently have techniques been developed for genetically modifying higher level cells. In the last three years mice, fruit flies, and plants have been produced that contain and express foreign genes. It will soon be technically feasible to introduce a specific gene or combination of genes into both crop plants and livestock to increase their productivity.

The second major advance is the great improvement in the understanding of immune system regulation and antibody production. Techniques have been established for the identification and isolation of regulatory factors and proteins that modulate various immune responses. Methods have been developed for producing large quantities of identical (monoclonal) antibodies. They have proven to be useful reagents in protein purification, diagnostics, and disease treatment.

Commercial agricultural applications of biotechnology

The potential for using these techniques in conjunction with other biotechnological methods for improving agricultural productivity is enormous. Commercial applications of biotechnology will impact several key areas in animal and plant agriculture.

Animal agriculture

Demand for animal protein in the world will substantially increase over the foreseeable future and increasing livestock productivity will be extremely important in meeting the demand. Fertility, health, and nutrition problems combine to reduce livestock productivity by **30 to 40** percent. Potential applications of biotechnology to animal agriculture should substantially increase productivity. Advances in the following areas will play a major role in increasing productivity (Bachrach, 1985).

Production of protein. One of the major thrusts of genetic engineering in animals is the mass production in microorganisms of proteinaceous pharmaceuticals, including a number of hormones, enzymes, activating factors, amino acids, and feed supplements. Previously obtained only from animal and human organs, these biologicals were either unavailable in practical amounts or more costly.

.Some of these biologicals can be used for detection, prevention, and treatment of infectious and genetic diseases. Some can be used to increase production efficiency. One of the applications of these new pharmaceuticals is the injection of growth hormones into animals to increase productivity. Several firms are developing a genetically engineered bovine growth hormone to stimulate lactation in cows. Trial results indicate that cows treated with the hormone increase milk production by **20 to 30** percent over the lactation period with only a modest increase in feed intake (Kalter, 1984). Commercial introduction of the new hormone awaits approval by the Food and Drug Administration. Approval is expected within the next three years.

Development of genetically engineered pharmaceuticals will also be important to disease prevention and treatment. An immunological product currently on the market prevents "scours" in calves. Also vaccines produced by recombinant DNA methods are currently being tested for foot-and-mouth disease, swine dysentery, and most recently, coccidiosis in poultry.

Gene insertion. A new technique arising from the convergence of gene and embryo manipulations promises to permit genes for new traits to be inserted into the reproductive cells of livestock and poultry, opening a new world of improvement in animal health and productivity. Unlike the genetically engineered hormones discussed above, which cannot affect future generations, this technique will allow future animals to be permanently endowed with traits of other animals. In this technique, genes for a desired trait, such as disease resistance and growth, are injected directly into the two pronuclei of a fertilized egg. Upon fusion of the pronuclei, the guest genes become a part of all the cells of the developing animal and the traits they determine are transmitted to succeeding generations.

Embryo transfer. This technique, which is closely related to the gene insertion, involves artificially inseminating a super-ovulated donor animal and removing the resulting embryos nonsurgically for implantation into surrogate mothers that carry the embryos to term. Before implantation, the embryos can be treated in a number of ways. They can be sexed, split (generally to make twins), fused with embryos of other animal species (to make chimeric animals or to permit the heterologous species to carry the embryo to term), or frozen in liquid nitrogen. Freezing is of great practical importance because it allows embryos to be stored until the estrus of the intended recipient on the farm is in synchrony with that of the donor. For gene insertions, the embryo must be in the single-cell stage, having pronuclei that can be injected with cloned foreign genes. The genes likely to be inserted into cattle are those for growth hormones, prolactins (lactation stimulator), digestive enzymes, and interferons, thereby providing both growth and enhanced resistance to diseases.

While less than 1 percent of U.S. cattle are involved in embryo transfers, the obvious benefits will push this percentage upward rapidly, particularly as the costs of the procedure decline. A genetically superior Holstein cow and her 14 embryos were recently purchased for \$1.3 million.

Plant agriculture

While the immediate impacts of biotechnology will be greater for animal agriculture, the long-term impacts may be substantially greater for **plant agriculture**. The application of biotechnologies in plant agriculture could modify crops so that they would make more nutritious protein, resist insects and disease, grow in harsh environments, and provide their own nitrogen fertilizer. The potential applications of biotechnology on plant agriculture include microbial inoculums, plant propagation, and genetic modification (Fraley, 1984).

Microbial inoculums. Rhizobium seed inoculums are widely used to improve nitrogen fixation by certain legumes. Extensive study of the structure and regulation of the **genes involved** in bacterial nitrogen fixation will likely lead to the development of more efficient inoculums. Research on other plant colonizing microbes has led to a much clearer understanding of their role in plant nutrition, growth stimulation, and disease prevention, and the possibility exists for their modification and use as seed inoculums.

Monsanto has announced plans to field test genetically engineered soil bacteria that produce naturally occurring insecticide capable of protecting plant roots from soil-dwelling insects. The company developed a genetic engineering technique that inserts a gene from a microorganism known as *Bacillus thuringiensis* into soil bacteria. This technique **has** been registered as an insecticide for **more** than two decades. Plant **seeds** can be coated with these bacteria before planting. As the plants from these buds grow, the bacteria remain in the soil near the plant roots, generating insecticide that protects the plants.

Plant propagation. Cell culture methods for regenerating intact plants from single cells or tissue **explants** are used routinely for the propagation of several vegetable, ornamental, and tree species (Murashige, 1974; Vasil et al., 1979). These methods have been used to provide large numbers of genetically identical disease-free plants that often exhibit superior growth and more uniformity than plants grown conventionally from seed. Such technology holds promise for important forest species with long sexual cycles that reduce the impact of traditional breeding approaches. Somatic embryos produced in large quantities by cell culture methods can be encapsulated to create **artificial** seeds that may enhance propagation of certain crop species.

Genetic modification. Three major biotechnological **approaches**—cell culture selection, plant breeding, and genetic engineering—are likely to have a major impact on the production of new plant varieties.

The targets of crop improvements through biotechnology manipulation are essentially the same as those of traditional breeding approaches: increased yield, improved qualitative traits, and reduced labor and production costs. However, the newer technology offers the potential to increase the rate and type of improvements beyond that possible by traditional breeding.

Of the various biotechnological methods that are being used in crop improvement, plant genetic engineering is the least established but the most likely to have a major impact. With gene transfer techniques, it is possible to introduce DNA from one plant into another, regardless of normal species and sexual barriers. For example, it has been possible to introduce storage protein genes from french bean plants into tobacco plants (Murai et al., 1983) and to introduce genes encoding photosynthetic proteins from pea plants into petunia plants (Fraleigh, 1984).

Transformation technology also allows introduction of DNA coding sequences from virtually any source into plants, provided they are engineered with the appropriate plant gene regulatory signals. Several bacterial genes have now been modified and shown to function in plants (Fraleigh, et al., 1983). By eliminating sexual barriers to gene transfer, genetic engineering will greatly increase the genetic diversity of plants (Fraleigh, 1984).

Impact on agricultural production

New and emerging technologies have already begun making their impact on agriculture. Biotechnology will play a central role in increasing productivity over the next three decades. This is particularly the case for animal agriculture, especially for dairy animals. The Office of Technology Assessment's (OTA) most likely projection is that these **technologies** will have a highly significant impact on milk production (Table 1). With the use of genetically engineered hormones, embryo transfer, and information technology, milk production per cow has the potential to double between 1982 and 2000. This will have considerable impact on the dairy industry including substantial regional shifts in production and an approximate 30 percent reduction in cow numbers.

In addition, feed efficiency in animal agriculture will increase at an annual rate of from 0.2 percent per year for beef to 1.4 percent for **poultry**. Reproduction efficiency would also increase, at an annual rate ranging from 0.6 percent for beef cattle to 1.1 percent for swine.

For crops, the impact will not be nearly as great (Table 2). The main reason is that biotechnology for plants will not be commercially **availa-**

ble to any great degree until the late 1990s. However, crop yields are still expected to increase from 1982 to 2000 at a rate ranging from 0.7 percent per year for cotton to 1.2 percent a year for wheat and soybeans. For the **most** part, these annual yield increases will keep pace with historical trends (OTA, 1985).

TABLE 1
Impact on Emerging Technology
on Animal Production Efficiency in Year 2000

	<u>Actual 1982</u>	<u>Most Likely 2000</u>	<u>Annual Growth Rate</u> (Percent)
Beef			
Pounds meat per lb. feed	0.07	0.072	0.2
Calves per cow	0.88	1.0	0.7
Dairy			
Pounds milk per lb. feed	0.99	1.03	0.2
Milk per cow per year (1,000lb.)	12.3	24.7	3.9
Poultry			
Pounds meat per lb. feed	0.40	0.57	2.0
Eggs per layer per year	243	275	0.7
Swine			
Pounds meat per lb. feed	0.157	0.176	0.6
Pigs per sow per year	14.4	17.4	1.1

Source: Office of Technology Assessment

TABLE 2
Impact of Emerging Technology on Crop Yields in Year 2000

	<u>Actual 1982</u>	<u>Most Likely 2000</u>	<u>Annual Growth Rate</u> (Percent)
Corn bu/acre	113	139	1.2
Cotton lb/acre	481	554	0.7
Rice bu/acre	105	124	0.9
Soybean bu/acre	30	37	1.2
Wheat bu/acre	36	45	1.3

Source: Office of Technology Assessment

Public and private sector environment in biotechnology research

Biotechnology research is being pursued in both the public and private sectors. With the conferring of private property patent rights in living organisms, there have been dramatic increases in private sector investments in biotechnology research with emphasis on applied and developmental research. The public sector has begun to strengthen its base in biotechnology research with emphasis on basic research.

Public sector

Federally funded research has been essential to the development of biotechnology in the United States. The United States currently has a strong and diversified basic research capability in biotechnology. Five agencies of the U.S. government basically fund biotechnology research (Table 3). In fiscal 1983 these agencies provided approximately \$500 million for biotechnology research. Most of the funding has come from the National Institute of Health.

The U.S. Department of Agriculture has recently begun to increase its funding of biotechnology research for agriculture, mainly through increases in competitive grants (Table 4). USDA's direct commitment in fiscal 1985 totaled \$75.1 million to both USDA and university laboratories. Of this, \$20 million resulted from the 1985 increase in competitive grants. In addition, more than \$30 million was expended from non-federal sources by the state agricultural experiment stations. Thus, the public sector directly involved in agriculture currently spends approximately \$100 million a year on biotechnology research.

Private sector

In the United States, two distinct sets of firms are pursuing commercial applications of biotechnology—new biotechnology firms (NBFs) and established companies. NBFs are entrepreneurial—new ventures started specifically to commercialize innovations in biotechnology. For the most part, they have been founded since 1976. Typically, NBFs are structurally organized specifically to apply biotechnology to commercial product development. The established companies pursuing applications of biotechnology are generally process-oriented, multiproduct companies in traditional industrial sectors, such as pharmaceuticals, energy, chemicals, and food processing. These companies have undertaken in-house biotechnology R&D in an effort to determine how and where best to apply biotechnology to existing or new products and

TABLE 3
U.S. Federally Funded Research in Biotechnology, FY 1983

	Dollars in Millions
National Institutes of Health	\$380.0
National Science Foundation	53.1
U.S. Department of Agriculture	34.0
Department of Defense	7.5
Department of Energy	36.1
Total	\$510.7

Source: Office of Technology Assessment

TABLE 4
U.S. Department of Agriculture Biotechnology Research
(Dollars in Millions)

	FY 1983	FY 1984	FY 1985	FY 1986 Budget
Agriculture Research Service (ARS)				
Plant Productivity	\$ 5.9	\$ 6.9	\$10.0	\$10.8
Albany Gene Expression Center	(0)	(0)	(2.0)	(2.9)
Animal Productivity	6.6	6.8	8.8	8.6
Soil and Water Conservation	1.0	1.1	0.2	0.2
Commodity Conversion and				
Delivery	0.3	0.6	7.2	7.2
Human Nutrition	---	---	0.1	0.1
ARS Total	13.8	15.4	26.4	26.9
Cooperative State Research Service (CSRS)				
Hatch Act	8.9	9.1	12.2	12.2
Special Research Grants	1.6	3.5	3.4	
Competitive Research Grants	8.3	9.0	29.5	29.5
All other	1.0	1.0	1.0	0.4
CSRS Total	19.8	22.6	46.1	42.1
Forest Service				
Intramural	0.4	1.1	1.0	0.9
Competitive Grants	---	---	1.6	---
FS Total	0.4	1.1	2.6	0.9
USDA Total	34.0	39.1	75.1	69.9

Source: U.S. Department of Agriculture

processes.

It is difficult to give a precise number on the expenditure of private sector funds directed toward biotechnology in agriculture. However, the number would dwarf that spent by the agriculture public sector. In fact, one or two major companies involved in biotechnology research could equal the USDA and state experiment station annual budgets. Monsanto reported in recent congressional testimony that about one-third of its total \$100 million research budget for agriculture is directed toward biotechnology research (House Committee on Science and Technology, 1985). A very conservative estimate of the total amount spent can be found in the 1984 survey of U.S. agricultural research by private industry conducted by the Agricultural Research Institute. The institute concluded that approximately \$95 million per year was being spent on biotechnology research for agriculture. However, that figure is conservative because the survey included only established companies. None of the NBFs were included. In any event, it is safe to conclude that the private sector is spending two to three times as much as the public sector for biotechnology research.

International competitiveness in biotechnology research

There is much interest in knowing how well the United States compares with other countries in biotechnology research important to agriculture. Other leading major potential competitors of the United States in biotechnology include Japan, the Federal Republic of Germany, Switzerland, France, and the United Kingdom.

U.S. and foreign efforts to develop and commercialize biotechnology differ substantially in character and structure. The manner in which the United States and other countries organize their development efforts is important because it can influence their respective commercial capabilities and it will ultimately shape the character of international competition.

Of the 219 U.S. companies for which commercial application areas are known, 62 percent are pursuing applications of biotechnology in pharmaceuticals, 28 percent are pursuing applications in animal agriculture, and 24 percent are pursuing applications in plant agriculture (OTA, 1984). U.S. companies commercializing biotechnology in agriculture are listed in Table 5.

In the foreign countries mentioned above, biotechnology is being commercialized almost exclusively by established companies. Unlike the United States, most European countries and Japan tend to empha-

size the importance of large companies instead of small ones. As a result, the development of biotechnology in those countries is considerably biased toward the large pharmaceutical and chemical companies.

TABLE 5
Companies Commercializing Biotechnology
In Agriculture and Their Product Markets

Company (date founded)	Commercial application of R&D*
Advanced Genetic Sciences, Inc. (1979)	PA
Advanced Genetics Research Institute (1981)	AA
Agrigenetics Corp. (1975)	PA, SCF
Allied Chemical Corp.	PA
Ambico , Inc. (1974)	AA
American Cyanamid Co.	Ph, PA, AA
American Diagnostics Corp. (1979)	Ph
American Qualex (1981)	Ph, AA
Amgen (1980)	PA, AA, SCF
Animal Vaccine Research Corp. (1982)	AA
Antibodies, Inc. (196)	Ph, AA
Applied Genetics, Inc. (1981)	AA
ARCO Plant Cell Research Institute	PA
Atlantic Antibodies (1973)	AA
Bethesda Research Laboratories, Inc. (1976)	Ph, AA
Bio-con , Inc. (1971)	AA
Biotechnica International, Inc. (1981)	PA, CCE, SCF, Env, AA, Ph
Bio-Technology General Corp. (1980)	PA, AA, Ph
Calgene, Inc. (1980)	PA
California Biotechnology , Inc. (1982)	Ph, AA
Cambridge Bioscience Corp. (1982)	Ph, AA
Campbell Institute for Research & Technology	PA
Centaur Genetics Corp. (1981)	Ph, PA, AA
Cetus Corp. (1971)	Ph, AA, CCE
Madison (1981)	PA
Chiron Corp. (1981)	Ph, AA
Crop Genetics International (1981)	PA
DeKalb Pfizer Genetics (1982)	AA
Diamond Laboratories	AA
Diamond Shamrock Corp.	AA, CCE
DNA Plant Technology (1981)	PA
Dow Chemical Co.	Ph, PA, CCE, SCF, AA, Env
Ecogen (1983)	PA
E. I. duPont de Nemours & Co., Inc.	Ph, PA, CCE, SCF, PA
Frito-Lay, Inc.	PA
Genentech, Inc. (1976)	Ph, AA, CCE, E1
General Foods Corp.	PA
Genetic Replication Technologies, Inc. (1980)	Ph, AA
Genetics Institute (1980)	Ph, PA, SCF, Env
Genetics International, Inc. (1980)	AA, Ph, SCF, CCE, Env, E1
Genex Corp. (1977)	Ph, AA, SCF, Env
W. R. Grace & Co.	AA, SCF, Env, PA, Ph
Hem Research (1966)	Ph, AA

Company (date founded)	Commercial application of R&D*
Indiana BioLab (1972).....	PA,AA,SCF,CCE
International Genetic Engineering Inc. (Ingene) (1980).....	Ph,PA,CCE
International Genetic Sciences Partnership (1981).....	PA,AA
International Minerals & Chemical Corp.	AA,PA,Env,CCE
International Plant Research Institute (IPRI) (1978).....	PA
Lederle Laboratories.....	Ph,AA
The Liposome Co., Inc. (1981).....	Ph,AA
Martin Marietta.....	SCF,PA
Merck & Company, Inc.....	Ph,AA
Miles Laboratories, Inc.....	Ph,SCF,CCE,AA
Miller Brewing Co.	PA
Molecular Genetics, Inc. (1979).....	Ph,PA,AA
Monoclonal Antibodies, Inc. (1979).....	Ph,AA
Monsanto Co.....	Ph,PA,AA,SCF
Multivac, Inc.....	Ph,PA,AA,SCF
Nabisco , Inc.....	PA
NPI (1973).....	PA,CCE,SCF
Neogen Corp. (1981).....	PA,AA
Norden Laboratories.....	AA
Pfizer , Inc.....	Ph,PA,CCE,AA,SCF,Env
Phytogen (1980).....	PA
Phyto-Tech Lab.....	PA
Pioneer Hybrid International Corp.....	PA
Plant Genetics, Inc. (1981).....	PA
Repligen Corp. (1981).....	Ph,AA,CCE,SCF
Ribi Immunochem Research Inc. (1981).....	AA,Ph
Rohm & Haas	PA
Salk Institute Biotechnology/Industrial Associates, Inc. (1981).....	Ph,AA,CCE
Sandoz , Inc.....	Ph,PA,AA
Schering-Plough Corp.	Ph,AA
SDS Biotech Corp. (1983).....	AA
SmithKline Beckman.....	Ph,AA
A.E. Staley Manufacturing Co.....	AA,PA,SCF
Standard Oil of Indiana.....	Ph,PA
Standard Oil of Ohio.....	PA
Stauffer Chemical Co.....	PA
Sungene Technological Corp. (1981).....	PA
Synbiotex Corp. (1982).....	Ph,AA
Synergen (1981).....	AA,SCF,CCE,Env
Syngene Products and Research, Inc.....	AA
Syntex Corp.....	Ph,AA
Syntro Corp. (1982).....	AA,CCE
Unigene Laboratories, Inc. (1980).....	Ph,AA
Universal Foods Corp.....	SCF,PA
The Upjohn Co.....	Ph,AA,PA
Worne Biotechnology, Inc. (1982).....	PA,CCE,Ph,AA,Env,SCF
Xenogen, Inc. (1981).....	Ph,PA
Zocon Corp. (1968).....	PA,AA

*Ph: Pharmaceuticals, PA: Plant Agriculture, AA: Animal Agriculture, SCF: Specialty Chemicals and Polymers, CCE: Commodity Chemicals and Energy, Env: Environmental (Microbial Enhanced Oil Recovery, Microbial Mining, Pollution Control, and Toxic Waste Treatment), E1: Electronics.

Source: Office of Technology Assessment

It should not be assumed that the small number of NBFs in the European countries or the lack of NBFs in Japan will retard those countries' development of biotechnology. Varying strategies, organizational differences, and cultural factors contribute to the competitive strengths of established companies in foreign countries. It is important to note, however, that the complementary efforts of NBFs and established companies in the United States have been a major factor in providing the United States with an early competitive advantage in the commercialization of biotechnology.

Although there are few NBFs outside the United States at present, some European countries are beginning to sense that small firms can make contributions to innovation, particularly in high-technology fields such as biotechnology. The British and French governments have aided in establishing such small firms as **Celltech** and Agricultural Genetics in the United Kingdom, and Transgene, France's leading biotechnology venture company (OTA, 1984).

Animal agriculture industry

U.S. companies. The animal agriculture industry encompasses companies engaged in the manufacture of products, the prevention and control of animal diseases, animal husbandry, growth promotion, and genetic improvement of animal breeds. Approximately 60 companies in the United States are known to be pursuing animal health-related applications of biotechnology, as shown in Table 5. Thirty-four (56 percent) of these companies are NBFs. Of special note is the role new firms appear to be playing in three major segments of the industry—diagnostic products, growth promotants, and vaccines. However, established U.S. companies are more involved in the development of animal growth promotants. The market for animal growth promotants is the second fastest growing market in the animal health field and one of the most competitive. Several established companies, including American Cyanamid, Eli Lilly, Monsanto, and Norden, have shown an interest in the field by sponsoring research contracts with NBFs, such as Molecular Genetics, Biotechnica International, Genentech, and Genex. American Cyanamid and Merck have contracted with NBFs for projects involving bovine growth hormone and a vaccine for foot-and-mouth disease.

Several NBFs are in a strong competitive position relative to established U.S. and foreign companies in animal-related biotechnology. Most of the established U.S. companies have made relatively small in-

vestments in this area—equal to or less than investments in animal health by most of the leading NBFs. As established U.S. companies in the animal health field increase their biotechnology investments, the U.S. competitive position should strengthen in domestic as well as foreign animal health markets.

Foreign countries. Established U.S. and European companies control world animal health product markets. Collectively, however, efforts of European companies to produce new or replacement vaccines or growth promotants using biotechnology do not appear to be as strong as the collective efforts underway in the United States. On the basis of reported research projects, European companies appear to be directed toward development of products for the animal vaccine markets, mainly for rabies and foot-and-mouth disease. U.S. companies dominate the world market for animal growth promotants. Few European animal health companies have indicated an interest in entering the growth promotants market.

Japanese companies have shown relatively little commercial interest in the area of animal health, probably because meat does not constitute as large a portion of the diet in Japan as it does in Western European countries and the United States. Recently, however, the Japanese chemical company Showa Denko and the U.S. company Diamond Shamrock set up a biotechnology joint venture, SDS Biotech Corporation, in Ohio, exclusively for animal health research.

Plant agriculture industry

U.S. companies. The plant agriculture industry encompasses companies engaged in R&D activities to modify specific plant characteristics or to modify traits of microorganisms that could be important to plant agriculture. The importance of plants as a food and renewable resource and the potential of biotechnology to alter plant characteristics has attracted a diverse set of firms to the plant agriculture industry. In 1984, 30 established companies and 22 NBFs listed in Table 5 were applying biotechnology to plants.

Established U.S. companies from industries ranging from oil and chemicals to food and pharmaceuticals appear to be dominating the U.S. investment in biotechnology R&D in plants. U.S. chemical companies that have made considerable in-house investments in plant-related biotechnology research include American Cyanamid, Dow, Allied, DuPont, and Monsanto. These companies already produce chemical pesticides and herbicides and conduct research using plant

cell and molecular biology techniques directed toward increasing the resistance of crop plants to these chemicals.

Some established U.S. companies have entered the plant agriculture field through the acquisition of seed companies. Seed companies provide both an in-place marketing system and high-quality, commercially successful gene pools, often representing as much as 10 to 20 years of **R&D**. Through ownership of seed companies; some established companies are assuming active roles in the modern research impetus for seed improvement. By assuming stronger roles in basic plant science research, U.S. companies like ARCO, Shell, Allied, Monsanto, and **DuPont** hope to play a leading role in developing future agricultural markets.

Foreign companies. Plant-related biotechnology is becoming commercialized more slowly in the European competitor countries than in the United States. For example, most West German plant tissue research is being conducted in universities. Some of the large European pharmaceutical companies are reportedly interested in plant tissue culture, but only a few have made their interests public. Although excellent basic research is conducted in such centers as the Max Planck Institute for Plant Research in Cologne, few commercial pursuits are known.

Great Britain has some of the strongest basic research in interdisciplinary plant sciences, and a new firm, Agricultural Genetics, was established recently by the British Technology Group, to exploit discoveries made at the Agricultural Research Council.

The Japanese are interested in developing amino acids and high-value compounds by selecting and engineering plant cells to produce secondary metabolites in vat culture. The Ministry for International Trade and Industry (**MITI**) has identified secondary compound synthesis as a major area for commercialization. This area of plant-related biotechnology research will receive approximately \$150 million from **MITI** over the next ten years. With their experience in large-scale bioprocessing, the Japanese are well ahead of the United States in this aspect of plant biotechnology. Japanese companies have already reported repeated success in growing plant cells in 15,000 liter batches. The upper limit in the United States is only 300 liters (**OTA**, 1984).

Although biotechnology is not expected to provide foreign countries with an ability to reduce U.S. dominance in world grain markets, it may provide foreign countries with opportunities to seize specific agricultural markets. In both France and Italy, for example, there are ma-

for commercial activities in plant tissue culture techniques for eliminating viruses and propagating fruit and nut trees.

Factors important to international competitiveness in biotechnology research

With the increasing importance of high-technology industries in the United States and the declining competitiveness of U.S. goods in world markets, it is important to be able to assess the **country's** future in the commercialization of emerging technologies. The three factors most important to the commercial development of biotechnology are financing and tax incentives for firms, government funding of research, and personnel availability and training.

Financing and tax incentives

The availability of venture capital to start new firms and tax incentives provided by the U.S. government to encourage capital formation and stimulate **R&D** in the private sector are important to the development of biotechnology in the United States. Since 1976, private venture capital in the United States has funded the startup of more than 100 NBFs. Many of these firms have already obtained second and third-round financing while others, still seeking additional funds, are relying heavily on the stock market, **R&D** limited partnerships, and private placements to fund research and early product development.

The future performance of NBFs now using the stock market and **R&D** limited partnerships extensively for financing may influence the availability of financing for other firms seeking capital in the future. Most NBFs still have negative earnings records. If some of these companies do not begin manufacturing soon and generating product revenues, investors may lose confidence in the ability of the firms to commercialize biotechnology.

Venture capital is generally more difficult to obtain in the United States for later rounds of financing than for initial rounds, partly because venture capitalists are more eager to invest in earlier rounds to maximize their returns. The difficulty in getting subsequent financing for production scaleup could be an insurmountable problem for some NBFs. Their ability to self-finance may still be five to ten years away.

Of all the six competitor countries, the United States has the most favorable tax environment for capital formation and small firm financing. Tax incentives, more than direct government funding, are used in the **United** States to stimulate business and encourage **R&D** expendi-

tures. Thus, **R&D** limited partnerships, low capital gains tax rates, **R&D** tax credits, and subchapter S provisions all benefit small firms.

In Japan and the European competitor countries, venture capital has played a minor part in the commercialization of biotechnology, because these countries do not have tax provisions that promote the formation of venture capital and investment in high-risk ventures. As a consequence, few **NBFs** exist outside of the United States. The established foreign companies that have initiated efforts to commercialize biotechnology can finance **R&D** activities through retained earnings and have access to financing from bank loans. Additionally, the governments of Japan, the United Kingdom, Germany, and France have provided the private sector with public funds for biotechnology research.

After the United States, Japan has the most financing available for companies using biotechnology (OTA, 1984). The Japanese government has made the commercialization of biotechnology a national priority and is financing cooperative interindustry biotechnology projects. Most of the established companies commercializing **biotechnology** in Japan have at least one bank as a major shareholder providing the company with low-interest loans for **R&D**. Wealthy individual investors in Japan have also provided some risk capital for new ventures.

Government funding of basic and generic applied research

The objective of basic research is to gain a better understanding of the fundamental aspects of phenomena without goals toward the development of specific products or processes. Such research, which is usually conducted at universities with the use of government funds, is critical to maintaining the scientific base on which technology rests and to stimulating advances in a technology.

The objective of applied research is to gain the knowledge needed to supply a recognized and specified need through a product or process. Such research is usually funded by industry.

Generic applied science can be viewed as bridging a gap between basic science done mostly at universities and applied, proprietary science done in industry for development of specific products. Such research is aimed at the solution of general problems associated with the use of a technology by industry. Generic applied research areas in **biotechnology**, for instance, include screening of microorganisms for potential products and better understanding of the genetics and

biotechnology of industrially important microorganisms. Support of basic science and applied generic research is generally viewed as the responsibility of government, because it ultimately contributes to the public good and because it is high risk and too expensive for individual firms.

Of the competitor countries, the United States has the largest commitment to basic research in biological sciences, both in absolute dollar amounts and in relative terms. However, this commitment has decreased in the last few years, and the government's commitment to generic applied research in this area is relatively small. In 1983, the federal government spent approximately \$500 million on basic biotechnology research, compared with \$6 million on generic applied research in biotechnology (OTA, 1984). Over the past several decades, the government has decreased its commitment to generic applied research areas, while increasing its commitment to basic research. This policy has contributed to a widening scientific gap between purely basic research funded by the government and short-term, relatively product-specific applied research funded by private industry. The relatively low level of U.S. government funding for generic applied research in biotechnology may cause a bottleneck in this country's biotechnology commercialization efforts.

Germany, the United Kingdom, and Switzerland also have a strong basic science base. Furthermore, the governments of Japan, Germany, and the United Kingdom fund a significant amount of generic applied science in biotechnology. Perhaps because Japan is able to rely on the United States and other countries to prove the early feasibility of new technologies for commercialization, the Japanese government devotes more public funding to the solution of generic applied science problems than to basic research. This strategy worked well in the semiconductor industry, and Japan may very well attain a larger market share in biotechnology products than the United States because of its ability to rapidly apply results of basic research available from other countries.

Personnel availability and training

Adequately trained scientific and technical personnel are vital to any country's industrial competitiveness in biotechnology. For the most part, countries with good science funding in a field also have a good supply of well-trained people in that field.

The commercial development of biotechnology will require **several-**

specific types of technical personnel. Especially important categories include molecular biologists and immunologists, microbiologists, biochemists, enzymologists, and cell culture specialists.

The United States currently has a competitive edge in the supply of molecular biologists and immunologists to meet industry needs, in part because the federal government has provided substantial funding since World War II for basic life sciences in universities. The supply of Ph.D. plant molecular biologists, however, may be inadequate. Most of the funding in life sciences has been directed to animal and human research. The plant sciences have not received an equivalent amount of attention or funding. That is why biotechnology advances in plant agriculture will not be significant until after the year 2000.

The United Kingdom and Switzerland have funded life sciences well and have a sufficient supply of basic biological scientists. Japan, the United Kingdom, and Germany, unlike the United States, have maintained a steady supply of both industrial and government funding for generic applied microbiology and bioprocess engineering in the past few decades and have adequate personnel in these areas. In Japan and Germany, slight shortages of molecular biologists and immunologists exist. Japanese companies are seeking to train personnel abroad. France appears to have shortages in all types of personnel.

The training of personnel is important to the continuing commercialization of biotechnology. The United States has good training programs for basic scientists, for the most part. Specialists in plant molecular biology are currently in short supply, but training in this area can be more readily achieved with interdisciplinary programs in biology departments in universities. However, the United States does not have more than a few training programs for personnel in the more applied aspects of biotechnology, nor does it have government programs, such as training grants, to support training in these fields.

Other factors

Three factors also important to international competitiveness in biotechnology are regulation, intellectual property law, and university-industry relationships.¹

¹Some argue that antitrust laws should also be included. However, antitrust laws of the United States and the other major competitors in biotechnology are generally similar in that they prohibit restraint of trade and monopolization. U.S. companies commercializing biotechnology face no major antitrust compliance problems, because the lack of concentration and the absence of measurable markets means that most types of joint research arrangements would not be anticompetitive.

Regulation involves health, safety, and environment. Japan has the most stringent health and safety regulation for pharmaceuticals and animal drugs, followed by the United States. Switzerland appears to be the most liberal. The regulatory environment favors the European companies over those of Japan and the United States reaching their own domestic markets for pharmaceuticals and animal drugs. Watch for the introduction of the bovine growth hormone in Europe before it is approved for use in the United States. The Food and Drug Administration has taken the position that recombinant DNA products with active ingredients identical to ingredients already approved, or to natural substances, still need to go through the new product approval process. However, data requirements may be modified and abbreviated. This appears not to be the situation in the competitor countries. In all the competitor countries, there is some uncertainty as to the environmental regulation governing the deliberate release of genetically manipulated organisms into the environment.

Areas of intellectual property law most relevant to biotechnology are those dealing with patents, trade secrets, and plant breeders' rights. These areas work together as a system. An invention may be protected by one or more of them. If one has disadvantages, a company can look to another. The U.S. intellectual property system appears to offer the best protection for biotechnology of any system in the world. This competitive advantage is due largely to the system providing the widest choice of options for protecting biological inventions, the broadest scope of coverage, and some of the best procedural safeguards.

university-industry interactions are an effective way of transferring technology from a **research** laboratory to industry. Interest in the commercial potential of biotechnology has significantly increased university-industry interactions, especially in the United States. Established U.S. and foreign companies have invested substantially in U.S. universities doing work in biotechnology. There are many advantages to such interactions, including an increase in the quantity of research discoveries, universities being able to retain top-quality scientists that might otherwise leave the university for the private sector, and patent monopoly rights necessary to attract the capital investment needed to translate scientific advances of universities into commercial reality.

Despite these advantages there are also disadvantages to such arrangements—particularly for land-grant universities. These universities were established by Congress under a unique social contract. Technology discovered in the land-grant system has to be freely availa-

ble to all firms or individuals desiring to exploit it. As a result of this social contract, land-grant scientists have historically worked in developing, adopting, and implementing new technologies **without** protecting property rights.

It is now possible to patent virtually all biotechnology discoveries within the land-grant system with little regard for its social contract implications. A variety of arrangements between land-grant universities, scientists, and private firms have been established. Such private sector arrangements integrate business into the university fabric. Questions develop over who controls the university research agenda. The allegiance of scientists to their university employer, the willingness of scientists to discuss research discoveries having a potentially patentable product associated with them, and potential favoritism shown particular companies by the university because of their research ties.

To the credit of the land-grant system, these questions have been and are being addressed. However, the basic social contract issue has not been resolved. The right to use discoveries of the system is no longer freely available. Certain individuals and firms are being conferred exclusive benefits to the possible detriment of others. The effect is to internalize the costs and profits from discoveries of the predominantly public-supported system.

Neither Japan nor the European competitor countries have as many university-industry relationships as the United States does, nor are they as well funded, but varying degrees of **cooperation** do exist. In Japan, the ties between university applied research departments and industry have always been close. Additionally, the Japanese government is implementing new policies to encourage closer ties between basic research scientists and industry. In Germany, the government has a history of promoting close contact between academia and industry and is cosponsoring with industry many projects important to biotechnology. Switzerland encourages communication between individuals in academia and industry. Universities in the United Kingdom and France have had very few ties with industry in biotechnology, but the governments of both countries have recently established programs designed to encourage university-industry relationships.

Conclusions

Continuing, rapid advances in science and technology promise to revolutionize agricultural production for the foreseeable future. In the

next 15 years, 1.5 percent of an estimated 1.8 percent annual growth in production needed to balance world agricultural supply and demand must come from increases in agricultural yields—yields that will be possible largely through the development and adoption of emerging technologies—especially biotechnology. These technologies must be used if this country is to compete in the international marketplace.

The unique complementarities between established and new firms, the well-developed science base, the availability of finances, and an entrepreneurial spirit have been important in giving the United States its present competitive advantage in the commercialization of biotechnology. To maintain this advantage, increased funding of research and training of personnel in basic and generic applied sciences, especially plant molecular biologists, will be necessary. The United States may also need to be concerned with the continued availability of finances for NBFs until they are self-supporting.

Japan will be the most serious competitor of the United States in commercialization of biotechnology. Japan has a very strong technology base on which to build, and the Japanese government has specified biotechnology as a national priority. The demonstrated ability of the Japanese to commercialize developments in technology rapidly will surely manifest itself in biotechnology.

Germany, the United Kingdom, Switzerland, and France lag behind the United States in the commercialization of biotechnology. The European countries do not generally promote risk-taking, either industrially or in their government policies. Also, they have fewer companies commercializing biotechnology. Thus, the European countries are not expected to be as strong general competitors in biotechnology as the United States and Japan.

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Commentary on 'Enhancing Competitiveness: Research and Technology in Agriculture'

John T. Marvel

Mike, you will be glad to know that my colleagues in St. Louis only have one request. They would appreciate your adding a Ph, SCF to Table 5 where **Monsanto** appears, in recognition of their recent acquisition of the GD Searle company. On a more serious note, you are to be commended on your analysis, which **reflects** the benefits of your efforts to bring together in a cohesive way all of the OTA panels, advisory group opinions, and feedback from the March special report. It will probably be **easier** for the audience to follow my **comments** if I follow your format of introduction, followed by the five sections you have divided the analysis into. **Essentially**, all of my comments are additive in nature as I am in substantial agreement with your thesis.

The "biotechnology and information era" will certainly be **more** profound than either the "mechanical" or "chemical technology eras." In spite of this statement, we may be underestimating the role biotechnology may need to play in agriculture. This opinion is based on the impact of biotechnology on human health care. In other words, the impact of biotechnology should **occur** in the order: human health care, animal agriculture; and plant agriculture. Many expect that the impact on health care will be dramatic, leading to significantly longer and healthier lives. Such a result would have an enormous effect on world population and, therefore, on world food supplies.

You have made a point several times that is worth emphasizing at the start of a **consideration** of **promising** areas of biotechnology for agriculture. The **point** is that while both animals and plants have been genetically modified—that is, foreign genes **inserted and** expressed—the work with animals is progressing at a faster pace and will continue to do so.

There is a good reason for this. The fundamental biochemical and molecular knowledge about **plants** is lacking. Public and private spending on basic research related to plants has probably been one one-hundredth of that spent on basic research related to animals, including humans. This is true not only in the United States but also in Western Europe and Japan. Therefore, I can only agree that biotechnology will have its most important influence on animal agriculture first, even though in the long run the impact on plants will likely prove to be of even greater significance.

There are four areas where biotechnology will likely impact animal agriculture: growth promotants, which you have represented by bovine growth hormone; vaccines, of which you have given several examples; therapeutics, like animal interferons; and gene therapy, which as you point out is aimed at correcting genetic deficiencies.

It is more difficult to categorize our lists of potential plant improvements because of the very lack of understanding referred to earlier. However, one could envision using the same four areas: growth promotants for new hybrid crops, photosynthate utilization, and nitrogen utilization; vaccines for disease or insect resistance; therapeutics for resistance to harsh environments; and gene therapy for animal protein production or removal of disease susceptibility. The lists in each area are long for both animals and plants, and you have covered most of the best-known examples.

These technologies clearly are capable of impacting production in a very significant way. Your projections on productivity changes until the year 2000 seem quite reasonable. The only major change that seems possible would be a faster than expected development of hybrid wheat. One other interesting note is that the introduction of bovine growth promotants in Europe is expected to reduce their beef surplus as, unlike in the United States, a major portion of their beef supply comes from dairy cattle. The environment for biotechnology research is certainly better in the United States than anywhere else in the world at this time. This is true for both the public and private sectors, as your estimates document. While I cannot prove your two to three-fold spending advantage of the private sector over the public sector, I share your view that it is very likely to be a conservative estimate.

International competitiveness in biotechnology research is difficult to assess with great accuracy because it is a moving target and, as you have accurately pointed out, because the work is carried out under widely varying circumstances in different parts of the world. While it is

quite accurate to view present biotechnology commercialization in Europe and Japan as occurring almost exclusively by established companies, we have seen a shift in this pattern recently in Western Europe, particularly in the United Kingdom, France, Holland, and Belgium, where the venture capital environment is very positive. In fact, many venture capitalists now are saying that the best opportunity for biotechnology investment is in Western Europe. While this shift does not change your current assessment, it is important to remember that a disproportionate share of the world's major "life science" companies are based in Europe, so I think we can assume that they will turn every effort to maintain their position. Indeed, the shift we are observing may be the beginning of that effort. It is equally sure, as you have said, that the Japanese are committed to excellence in biotechnology and their record of success in priority areas is, needless to say, impressive. My only point is that it is going to be an extraordinarily competitive field with major international implications.

In considering the factors important to international competitiveness in biotechnology, research, financing-tax incentives, government funding of research, and personnel availability/training are certainly among the most important considerations. However, the private sector would consider patent protection, property rights, and regulation at least as critical. The best support for that position is that countries where these factors are best developed are precisely the world leaders in biotechnology (or any technology), that is, the United States, Western Europe, and Japan. Certainly the United States has been the leader in raising money for biotechnology, albeit there will inevitably be a number of casualties due to an inability to finance the very expensive development stage of new products. As was mentioned earlier, the venture capital pace appears to be picking up in Europe and there are signs that this may also occur in Asia.

You have also noted correctly that biotechnology funding tends to be somewhat obscured in both Europe and Japan because much of it is going on in established companies. Governments of Western Europe, Japan, and the United States have all demonstrated a strong commitment to fund basic and applied biotechnology research. In the United States, I am not sure that we have underfunded applied biotechnology research as much as we may have failed to ensure a strong and healthy working relationship between practical agriculture and the basic science departments on our campuses. Because of the significant funding available for biotechnology research in the United States, there is in-

deed a good supply of qualified research personnel, with the exception of plant molecular biologists/biochemists and biotechnical engineers. The latter will be in increasing demand as new products move toward manufacture.

It is in the best interest of the public and private sectors to have a regulatory system that is respected and credible. It would be incorrect to conclude that a regulatory system that requires the longest time to register a product is either the most stringent or the best system. The point you have made of first sales of bovine growth promotants in Europe is a case in point. Another case in point is our microbial test product, which was submitted for approval for field tests in the United States more than a year ahead of other locations and may well be in approved field tests in Western Europe before it can be tested in the United States.

The regulatory process may have a major impact on international competitiveness. For example, European firms naturally target European markets as a high priority and, because of the extremely high costs of launching a life science product, the faster clearance of products in Europe gives these firms the very great advantage of recovering their costs more rapidly. The European Economic Community is working hard to propose standard biotechnology guidelines for registration at this time, while individual countries have recombinant products cleared or in the pipeline.

Property rights, like regulation, could be a major factor in international competitiveness. Property rights have patent law as their cornerstone, but that is by no means the end of it. There are serious issues over production of data that if allowed to be used improperly can and does lead to piracy followed by illegal production of what were supposed to be protected materials in various countries around the world. Where legitimate, there is a need to patent biological systems, including seeds. There is a need to extend patent life for all products with a protected commercial life that is affected by regulation. There is a need to prevent pirates from using data the inventor has produced at great time and expense from registering the product in another country for essentially no cost. There is a need for reciprocal trade agreements that require respect for property rights. Countries or world areas that have these property rights will have a very significant advantage.

Your observations on university-industry relations have identified the key issues. My own feelings are that a strong relationship between academic and industry is probably far more beneficial than harmful if

properly managed. I have found to my surprise that both in Europe and Japan there is, if anything, a closer relationship between the academic community and industry than in the United States, despite some of the very large funding programs in the United States. Your conclusions are certainly valid based on the current situation. However, I would advise anyone involved in this field to keep in mind that fine old baseball dictum, "It ain't over until it's over." In other words, run smart, fast, and scared.

Enhancing Competitiveness: Infrastructure and Agriculture

Ray A. Goldberg

In this paper, I broaden the term "infrastructure" to mean the total **support structure** of a global **agribusiness** system and the **institutions** and arrangements that help to coordinate the **functions** and flows of the system as well as the **functions** that are performed in the system. These **functions include input farm supplies**, farming, assembling, transporting, storing, processing and distributing final food and fiber **products** to the **ultimate** domestic and international consumer.

To assess how U.S. **agribusiness** has **used infrastructure** and **institutional** arrangements to compete in global **agribusiness**, one has to place U.S. **agribusiness** in its historical setting.¹ After World War II, the objective of U.S. farm policy was to maintain relatively high price supports so that the farmer **would** not bear the major **burden** of adjustment as the U.S. food system made the transition from a wartime to a peace time economy. **During** this **adjustment** period, high domestic price **supports** enabled farmers to **continue purchasing** farm supplies and capital improvements for their farms. **Because** these high price **supports** acted as a price **umbrella** for our global grain competitors, the United States became a **residual supplier** to the export market. The government paid a cost differential between the lower world price for U.S. **farms** commodities and the domestic high price **supports** to exporters so they **could** sell in the world market.

¹ Agribusiness, as developed at the Harvard Business School, includes all of the interrelated private and public policymaking enterprises, from farm supply, farming, and processing through distribution to the ultimate consumer — including all private and public coordinating mechanisms that hold the commodity system together and enable them to adjust to technological, political, social, and economic change. Agribusiness contains large and small-scale participants, irrespective of the economic and political systems involved.

Even with the **PL. 480** Program that shipped some \$25 billion worth of commodities overseas, surpluses began to build up in the United States. These surpluses, in turn, resulted in a subsidized storage program to store the surpluses and a guaranteed occupancy and payment program for storage at both the on-farm and off-farm levels. Similarly, both political parties encouraged farmers to play a more active role in manufacturing and supplying their inputs and processing and distributing their food products, as well as making full use of the government storage program through the improved credit facilities of the Farm Credit Bank for Cooperatives. The domestic storage program resulted in the development of a grain storage capacity large enough to hold grain reserves not only for the United States but for the world. We became, in essence, the buffer zone or shock absorber for any change in the global food system. We could afford to do so in a less volatile surplus food production-oriented world, with low interest rates, fixed exchange rates, and prices that, except for wartime explosions, varied less than 10 to 25 cents a bushel. Our concessional **PL. 480** sales and our contributions to the World Bank were used to build up postwar economies, especially those of the developing world. At least 25 percent of these expenditures were for agribusiness projects with major emphasis on infrastructure, such as roads, irrigation, credit, and farm extension systems.

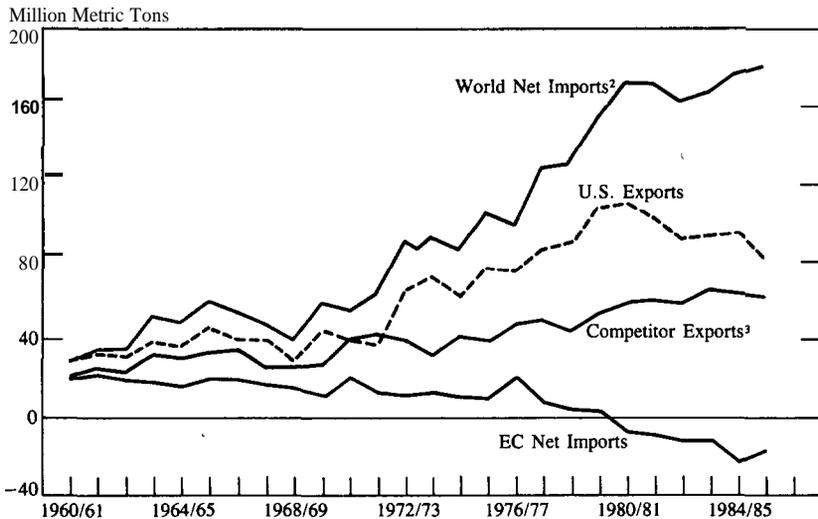
In 1972, when the Soviet Union changed from a global agricultural commodity exporter to an importer, a global food economy changed from "buyers market" to a "sellers market". Product differentiated food processors found that they really were part of an agribusiness vertical food chain, as did fast-food operators. Instead of the U.S. government price support program being a substitute futures market, commodity futures markets came into their own prominence. Risk management tools in the form of long-term futures contracts became critical to all participants in the food system. Just as sourcing became global, so did marketing. By the early 1980s, over 40 countries imported one million tons or more of grain a year compared with a handful a few decades before.

Consolidation in the number of firms has occurred in every aspect of on-farm and off-farm activity at a national level at the same time global competition has increased at every level. You can buy **Coca-Cola** and **Pepsi-Cola** on a global basis. You can find **McDonalds**, **Dunkin' Donuts**, and **Kentucky Fried Chicken** outlets circling the globe. Farm machinery, pesticides, and fertilizer firms compete the

world over, as do processed food companies from Heineken Beer to Cadbury-Schweppes products. Yet these sales are also tied to the same governmental market access constraints as confront the agricultural commodity firms.

By 1985, as previous speakers have noted, we once again live in a surplus food economy, with those nations and individuals that need the food the most not having the funds to buy it or the resources to produce it. Not only have we moved from a sellers to a buyers market, but the global interdependency of the 1970s and early 1980s has developed market structures and **processing capacities** to more efficiently serve that market. We built a totally vertical food system and trading system around an expanding global market that not only stopped expanding but went into a decline. The United States, in essence, has a declining market share of a declining global food system (Chart I). Excess capacity exists in each vertical structure from input farm supplies, farming, transportation, **processing**, and distribution. Once again major countries and economic regions have insulated their agribusiness

CHART 1
Major Components of World Grain Markets¹



¹Total wheat and coarse grain

²Net imports by world less U.S., EC, and competitors

³Canada, Australia, Argentina, South Africa, and Thailand

food system from the world food system, with the result that the United States and the developing world become the buffer for the system. Those that are in the weakest position to make the adjustment are forced into adjustment, namely, the U.S. farmer, the U.S. consumer, and selected developing country producers and consumers. Many countries that believe in global free markets in expanding markets and rising price levels find it economically, politically, and socially difficult to make downward price shifts to world price levels that drop suddenly over a short period of time.

1985 and beyond

How then do current structures affect the U.S. agribusiness competitive position in the future and what actions can private and public managers take both to restructure U.S. agribusiness and to make it more competitive? What global strategies are available to U.S. agribusiness firms and institutions?

In 1985, taking a system's approach to global agribusiness, one notes the overall commercialization of global agribusiness with an increase in purchased farm supplies and food processing and distribution (Table 1). As mentioned previously, there is a large carryover of cereal

TABLE 1
Global Agribusiness Estimates for 1950 and 1980
(billions of current dollars)

	<u>1950</u>	<u>1980</u>
Farm Supplies	44	375
Farming	125	750
Processing & Distribution	250	2,000

Source: Author's estimates based on discussions with USDA economists.

stocks—almost reaching the 1982-83 levels. The United States continues to be the major inventory holder in the world. These carryovers, together with net international transfers from the developing countries, have resulted in a decrease in purchasing power that has led to a decrease in major commodity prices on a global basis. This has occurred even though global food production per capita has been **increas-**

ing at a decreasing rate (Table 2). At the same time, most nations' food policy priorities are such that they prefer to be as self-sufficient as possible.

TABLE 2
Global **Food** Production Per Capita

<u>1951-53—1959-61</u>	<u>1959-61—1968-71</u>	<u>1969-71—1979-81</u>
1.42%	0.62%	0.23%

Sources: U.S. Department of Agriculture and FAO

This has led to an increase in the commercialization of agribusiness in both developed and developing countries as sophisticated input and processing operations have been created. The infrastructure of the key players, such as China, India, and the USSR, has also increased. World agribusiness still employs about 50 percent of those employed in the world and major agribusiness systems in major countries account for 26 percent of the world's GDP. Similarly, while 48 percent of consumer expenditures are still spent on agribusiness products, the commercialization of agribusiness has seen this reduced from 69 percent in 1950 (Table 3). Although export markets are critical for U.S. agribusiness,

TABLE 3
Agribusiness as a Percent of GDP
Of Selected Major Agribusiness Countries
(weighted average)

<u>1950</u>	<u>1960</u>	<u>1970</u>	<u>1980</u>
41%	34%	27%	26%

Source: U.S. Department of Agriculture and FAO

the industrialization of the world economy has reduced agribusiness trade as a percentage of total global merchandise trade even during the sellers market of 1980 from 46 percent in 1950 to 20 percent in 1980. This is one indication of why our trade representative can look at agri-

business as only one bargaining chip at the global trade table (Table 4).

TABLE 4
**Agribusiness Trade as a Percentage of Total
Merchandise Trade of Major Exporting Countries**

<u>1950</u>	<u>1960</u>	<u>1970</u>	<u>1980</u>
46%	39%	24%	20%

Source: U.S. Department of Agriculture and FAO

To be competitive in this new buyers market, the global agribusiness economy becomes even more difficult when one realizes that one does not make a sale on price alone. Most sales involve long-term agreements and many of the purchases are made by state trading organizations (Tables 5 and 6). Countries want to know not only how the sale

TABLE 5
Bilateral Agreements as a Proportion of World Trade

<u>Selected Countries</u>	<u>Wheat</u>	<u>Coarse Grains</u>
Range of Percentages of Average Imports 1979-82		
Brazil	12%–47%	—
China	89%–100%	100%
Egypt	16%	—
Libya	67%	100%
Mexico	20%–40%	17%
Poland	15%	15%–25%
U.S.S.R.	31%–50%	48%–53%
Yemen	67%–83%	—
World Total	43%–56%	37%–45%

Source: FAO

TABLE 6
**Wheat Imports
(percent)**

	<u>1960</u>	<u>1965</u>	<u>1970</u>	<u>1975</u>	<u>1980</u>
Free Traders	2.9	2.7	5.2	4.3	3.2
State Traders	62.6	77.9	65.4	75.1	80.9
Variable Levies	34.5	19.4	29.4	20.6	13.6
Licensing	0	0	0	0	2.3

Source: U.S. Department of Agriculture

helps them but what type of reciprocal trade agreement can be made for their products and what type of technology accompanies the product to aid in the development of their country. This, in turn, leads to new types of firms, institutions, and joint ventures to respond to these new market needs.

The consolidation of global agribusiness has also developed new types of organizations to serve the customer on a more direct basis. For example, Conagra, through acquisitions, now has a billion dollar agricultural chemical distribution system in the United States and, with the recent acquisitions of a German trading firm, cannot help but look at the global market in a similar fashion. It is striking to note that one million farmers each with over 200 hectares of land account for most of the commercial farm commodity sales in the world, even though there are a total of 140 million farmers (Table 7). Similar consolidation is occurring at every level of operation in every nation.

TABLE 7
Number of Farms in the World
(millions)

	<u>1950</u>	<u>1960</u>	<u>1970</u>	<u>1980</u>
World	92	109	133	140
Under 5 Hectares	72	84	108	118
Over 200 Hectares	0.7	0.9	1.0	1.0

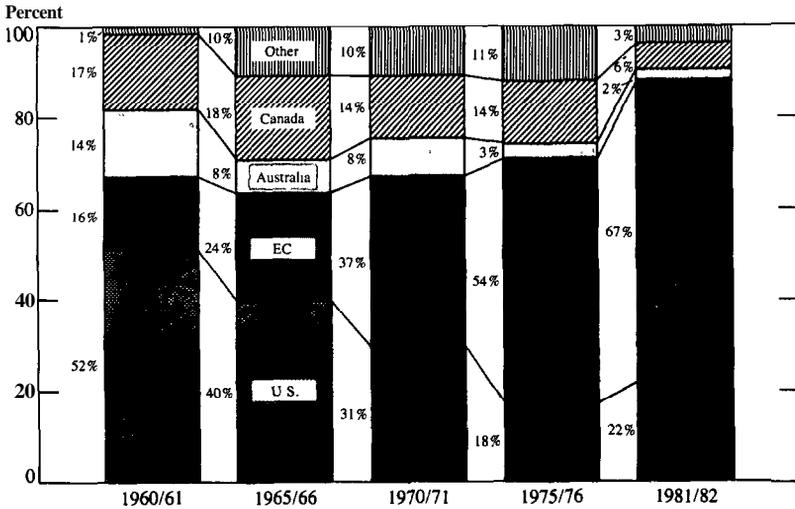
Source: World Bank

The competition has become globalized for sourcing and for markets. Market orientation, product differentiation, service differentiation, and financing engineering as well as market access, are the competitive tools required by every segment of U.S. agribusiness. Our potential strength in value-added products has not been fully developed, partially because we were lulled to sleep first by historical high domestic price supports in the previous buyers market of the 1950s, 1960s, and early 1970s. We were then further lulled to sleep by the sellers market of 1972-81. That luxury is no longer available to us.

In addition to fighting traditional market-oriented battles on a global basis, we have to compete with such regions as the European Community (EC), which have insulated their producers to the point that they produced surpluses for their domestic market. They then turned to processing as an answer that, in turn, shifted the surplus

from raw commodity to processed product. They then subsidized the processed product in the international market and the result is shown in Chart 2. The EC global share of the flour market increased from 16

CHART 2
Relative Share of World Exports of Wheat Flour
Commercial and Special Transactions
(1960/61—1981/82)



Source: IWC Record of Operations; USDA

percent to 67 percent in 1981-82. We have to place global agribusiness under the trade jurisdiction of GATT, with or without the EC's participation, to create a global climate in which there is a new understanding of the rules of the game.

In addition to the new types of markets and new types of competition, our former customers are becoming our competitors, thus making a complicated global agribusiness market even more competitive. India now has 34 percent of its cropland irrigated, using 50 percent high-yielding varieties in a variety of crops, going from 294,000 tons of fertilizer in 1960 to 7.8 million tons in 1984. They also have had credit available to their producers increase from \$286 million to \$2.9 billion. In addition to this type of infrastructure change, they have created

imaginative institutions such as the Amul Dairy Cooperative, not only to involve their landless labor and small-scale and medium-scale producers but in a way that **improved** the quality of their dairy and buffalo herds, their end consumer products, and their byproducts. Amul Dairy developed brand names of chocolate candies, drinks, and quality cheese products as part of a practical market-oriented dairy **system**—paralleling in many ways the creative market orientation of successful U.S. **cooperatives**, such as Ocean Spray, that not only develop products based on their producer's crop but practice "creative destruction" by utilizing other flavors—natural and synthetic—to broaden the base of the market opportunities for their producer-owners.

Similarly, the USSR has increased its infrastructure through an increase in irrigation, fertilizer, farm machines, and chemicals. Irrigated land now accounts for 12 percent of the land on which 25 percent of their major crops are produced. The country is making a major effort to improve roads, storage facilities, and communication to develop more specialized agribusiness sectors in every major region of the country. There is no doubt that firms such as Archer Daniels Midland (ADM), proposing turnkey operations to the USSR for efficient corn and soybean processing operations as well as drying and **assembling** equipment to cut down waste, are providing services that fit into the new long-term agribusiness development of the country. It is conceivable that over the next several years the USSR will again become a major exporter of food rather than a major importer. It is also true that just as the EC has encouraged agribusiness intra-trade within its system, so has the Soviet Union with its partners in COMECON.

China, too, has made great strides in freeing up its rural economy, increasing rural incomes by 40 percent and ending up exporting corn and soybean meal as well as reducing its imports of wheat. In addition, China has welcomed joint ventures between cooperative and proprietary corporations and provincial governments. Many of these projects are long-term in nature, from a 20-year integrated hog operation producing over \$2 billion of hogs for the Hong Kong market to an integrated vineyard producing wine and brandy for **Remy Martin** and the domestic **and export** market. China also has benefited from **World Bank** loans that started out at the \$200 million level and are currently at the \$2 billion level.

In addition to the existing technology being better utilized in many of the major developing and centrally planned economies together with the improvement in their infrastructure and the development of

private-public joint ventures in agribusiness, many of these nations are most interested in having their agribusiness systems leap-frog the development process through the use of biotechnology. Incentives are given in each of the countries cited above to develop their own internal biotechnology and work with other private and public entities to acquire this knowledge that could be utilized in special country problems from lactose toleration to the improvement of drought, cold, and salt resistance varieties of seed. Technology and turnkey operations are specific ways of differentiating the sellers of other inputs and food and commodity products to the developing and centrally planned economies.

Tables 8 and 9 highlight ways the \$3 billion biotechnological investment in the United States may affect agribusiness. U.S. firms have

TABLE 8
Entry Points for Biotechnology in Agribusiness

Farm Input	Seeds, fertilizer, disease, pesticides, growth hormones, herbicides, fungicides, plant growth regulators, feed additives, vaccines, antibiotics, bacteria
Processing	. Low cost processing of fructose and aspartame
Distribution	Vege-snacks, milk shakes
Consumption	Diagnostic and therapeutics for cancer, cell functions

TABLE 9
Biotechnological Trends

1. Number and type will grow
2. Shorten cycles
3. Breed of hybrid managers
4. Private and public cooperation
5. Entrepreneurship
6. Market access

been investing at the rate of \$550 million a year; the EC has been investing \$355 million a year, and Japan \$150 million. Dr. Michael Phillips' paper does an excellent job of setting forth the potential of this new technology. Thus far, the scientific projections have erred on the side of conservatism. Scientists have been making breakthroughs at a faster rate than they anticipated. Therefore, I would assume that the

application of these findings will also occur more rapidly, from the growth protein for milk cows to phenylalanine from corn to specially created vege-snacks for consumers. This technology may lead to direct selling of selected agricultural chemical products to large-scale producers, as well as to joint ventures with global grain firms to provide an international market intelligence system for their technical products. This technology will shorten production and estrus cycles, lead to greater private and public cooperation, and produce a new breed of management leaders from the technical and R&D sections of many corporations and cooperatives.

Implications for U.S. agribusiness competitiveness

U.S. agribusiness is faced with a further decline in its traditional developed and centrally planned agribusiness markets. It will have to renew efforts to capture the growth markets of Southeast Asia, Latin America, Africa, and the Middle East. To capture these new markets will require bridge loans from the World Bank and others and a better understanding and utilization of these financial institutions than currently exists in many U.S. corporations and cooperatives.

Global competition requires a restructuring of U.S. agribusiness both internally and externally. New alliances are occurring, such as **ADM-Toepler-Growmark**, that encourage domestic sourcing and global market intelligence. Other alliances, such as Continental Grain and the A. E. Staley Co. and American Maize and Quincy Soybean Company, will become more common to provide product quality differentiation in response to specific market, product, and logistics needs of global consumers.

Global customers require a complete package of goods and services, including financial and turnkey engineering. A new joint venture of the Louis Dreyfus Company and the German metallurgical firm **Metallgesellschaft Services Inc.**, provides these services together with counter-trade that enables effective sourcing and market access. This is only one example of firms responding to these needs.

U.S. farmers are not the enemies of farmers in other lands. They work out joint ventures, such as in the case of U.S. and EC farmers in their joint ownership of Toepler (a German trading firm) with ADM, the other owner. A raspberry farmer in Oregon has a joint venture with a raspberry farmer in Chile, so that together they have seasonal overlaps to satisfy the raspberry market in the United States.

Successful U.S. food processors use European technology and Euro-

pean flavoring to develop products for the U.S. market and for global markets. In essence, they use the technology of competing firms in competing markets just as others use American technology to compete in U.S. markets.

Historically, the U.S. agribusiness system has not had to compete on a global basis. We have been order takers, government program suppliers, or have had people beat a path to our door for technology. We must now compete as never before. We have to maintain the technological lead that we have in molecular genetics and utilize this technology through the creative managers we have in this country to satisfy global food needs in an imaginative and market-oriented basis. We also need to cooperate with nations that want to have agribusiness placed under GATT and abide by new trading rules to have a common trading system with or without the EC. Finally, we have to continue to build on our managerial strengths in both the private and public sector and build unique global institutions and arrangements that bypass the national political pressure groups that keep governments from working together more effectively to improve a truly global interdependent agribusiness system.

Enhancing Competitiveness: U.S. Agricultural Policy

Richard E. Lyng

When this symposium was being planned six or seven months ago, I was invited to prepare this paper, to be entitled "U.S. Agricultural Policy." I was asked to consider particularly the effect of U.S. policy on agricultural export competitiveness. Six months ago, this seemed a challenging but not impossible assignment. Now, because as I prepare the paper U.S. farm policy is still to be decided, the task is more nearly impossible than challenging.

The House of Representatives has suffered through many days of vigorous debate and has finally approved the Food Security Act of 1985. The House bill differs sharply in many areas from the bill passed by the Senate Committee on Agriculture, Nutrition, and Forestry. They call their bill the Agriculture, Food, Trade, and Conservation Act of 1985. Earlier, the administration's farm bill proposals had been almost totally ignored and its spokesmen were terming much of what had passed the committee as unacceptable—so unacceptable, in fact, that there may be a veto.

Well, by the time I speak at the symposium, we will know how it all turned out. If it did turn out, that is. I am submitting this paper on October 10, as requested. It would have been easier to have waited until Congress, in its wisdom, had completed action. But, unable to wait, I will make assumptions that will prove how little I was able to predict the outcome.

It is a little like forecasting the outcome of the Civil War, knowing that the battles of Antietam and Gettysburg are coming up soon but not knowing which army will prevail. Actually, though, there's nothing new in this. Those of us talking about agricultural policy do so most of the time without accurate knowledge of what is going to happen. It has

always been that way.

A golden age for farm exports

As this nation moved from steadily expanding agricultural exports during the 13 years prior to 1982, we paid relatively little attention to our domestic farm policy. There was no strong reason to spend much time on farm policy legislation because so much was moving so fast that our farm programs played an almost insignificant role. A weakening dollar made for a period in which, it is now clear, we had a truly golden age for U.S. farm exports. Steady, accelerating inflation during the 1970s made commodity target prices and loan levels play very minor roles in a happy drama in which there was a sense of everlasting farm prosperity.

In this cheerful milieu, the need seemed slight to worry about a farm policy that would have a long-term beneficial effect on U.S. farm exports. Policymakers and politicians gave lip service to it, but the vast majority assumed a trend line that would assure the U.S. a place in world farm trade of long-term, steady, profitable growth. Three successive administrations interrupted our exports with embargoes. They did this without apparent concern about long-term consequences. Expansion seemed our birthright. Land would grow ever more scarce in relation to demand. Almost no price was too high to pay for good farmland. Lenders considered farmland superb collateral and some urged farmers to borrow up to 80 percent of market value.

In late November 1980, at the U.S. Department of **Agriculture's** 57th Annual Outlook Conference, the general conclusion was that the world demand for food was growing so fast that the United States could no longer be the breadbasket of the world. The *Wall Street Journal* reported that 'officials' and guest experts described the farm and food situation in such bleak terms as 'precarious: 'dangerous: and 'worse than before.'

Experts on the program said that food in the 1980s would be what oil became in the 1970s—scarce and expensive. One well known economist said, "What it gets down to is **we've** only got so much grain. Are consumers willing to pay more for their food to keep the grain at home than importing countries are to ship the grain there?"

The chief economist at USDA predicted that demand for U.S. grain exports would increase 8 percent a year for the first half of the 1980s. Some of those present thought his estimate too conservative.

In 1981, it was in this environment, in a nation and a world where

“food security”ⁿ had become a buzz phrase, that the new Reagan administration and Congress went to work to draw up the Farm Act of 1981.

Domestic farm policy stimulated increased production worldwide

With the clear sharp vision of hindsight, it is quite evident that the errors of the 1981 legislation were numerous and significant. Not only did Congress erroneously anticipate continued inflation, but too many of us almost totally ignored the incentive that our commodity loan levels give other nations throughout the world to produce more corn, more wheat, more cotton, more rice, more honey, and on and on, wherever we had loan levels that were too high.

The result, of course, has been steadily expanding production all over the globe. We actually have, through our farm policy, established loan levels that are so high they have forced the United States to become the residual supplier in export markets. Our competitors simply price their commodity just a little under our loan level. When their stocks are sold, the buyer turns to the United States. And every year our sales slip a little more.

The strength of the dollar made the production of wheat, corn, other feed grains, cotton, and rice at U.S. loan rates look like good business in Argentina, Brazil, China, Thailand, the European Community, India, and dozens of other areas. U.S. exports, which went up to **\$43 billion** in 1981, will be down by a fourth this crop year. USDA forecasts farm exports as the lowest in the past eight years. This bad news comes at a time of large crops and already heavy stocks.

U.S. farm export volume in 1985 is expected to be down 20 percent from 1981, while farm exports in the rest of the world are up 14 percent. At the same time, U.S. agricultural imports have increased 29 percent since the early 1980s.

Lower loan rates will increase our ability to compete

All this is well known now. The folly of keeping loans levels too high is more clearly understood than it was in 1981. Both Houses of Congress are supporting lower loan rates, sharply lower loan rates, with authority for the Secretary of Agriculture to drop them further if the market requires. This action in 1985 will make the farm exports of the United States far more competitive as we move into the 1986 crop year.

No longer will the loan levels be the support price. There is, in fact, no such thing for wheat, corn, rice, cotton, or feed grains under the

1985 legislation. In the 1981 Act, our loan level became the support price for our competitors. We are going to stop that. This will mean, for example, that if the European Community wishes to continue to expand its exports and take our wheat and wheat flour customers away from us, they will need to reach much farther down in their pockets to pay a much larger export subsidy.

If the dollar should weaken in an important amount, that will help make U.S. farm products more competitive throughout the world. But the action on the loan levels will begin to help, regardless of the value of the dollar.

If this is such a good idea—this lowering of the loan level—why didn't we do it before? Well, it costs a lot of money, for one thing, if you offset the decline in the loan level with a larger deficiency payment or a marketing loan adjustment or "forgiveness" amount. At a time when farm incomes are far too low, it has been impossible to lower loan levels without increasing the government contribution to farm income. The problem is, of course, that the exposure will be great for mammoth federal outlays, even larger than during 1983 and 1985. At a time of record deficits, the cost of our farm program is not pleasant for the administration or Congress to accept.

But it has been clearly evident in 1985 that it is impossible for Congress, faced with economic disaster in farm areas everywhere, to adopt a farm policy that does not include at least some actions to bolster farm income.

The Farm Bill of 1985, or whatever it is called, will be historic in establishing a new approach to crop loans and in eliminating a major impediment to export sales. The United States will definitely be more competitive on the commodities for which the Farm Bill provides loans and target prices.

Is this, then, good legislation? Does it solve the problems of agriculture? In my view, it most emphatically does not. As we move into the five-year period 1986-1990, we will begin to see improvements in exports. But we will see some other developments that will have negative impacts on long-term agricultural growth.

The problem of acreage reduction programs

However necessary it is to freeze target prices to ensure enough farm income at this depressed time, the incentive for farmers to produce more than we can use or sell will be strong. We will almost certainly continue to produce too much. And that means a continuation of

larger and larger acreage reduction programs—probably more and more acreage taken out and increasing production at the same time.

In 1985, even with heavy reductions—10 percent in corn, 30 percent in wheat, 30 percent in cotton, and 35 percent in rice—we are actually adding to our inventories in all of these commodities. The budget busting costs of the commodity programs will cause further reductions next year, perhaps to as much as 20 percent in corn, 30 percent in wheat, 40 percent in cotton, and 50 percent in rice. With this dimension of massive acreage reduction, we will have a seriously flawed farm program. So while we may applaud the reduction of loan levels for making our exports more competitive, the failure to reduce the target prices that stimulate overproduction—forcing cutbacks—leaves a far from satisfactory farm policy.

The question is sometimes asked, particularly in recent years, "Can the U.S. farmer compete with farmers elsewhere in the world?" The answer is, yes, he can, in most of our major crops, but only if we allow farmers to reduce their costs. To remain competitive, farmers must be given every opportunity to reduce their per unit costs to the barest minimum possible.

Acreage reduction programs take away a big part of the farmer's opportunity to reach peak efficiency. When a farmer is equipped to grow a crop of rice on 300 acres—when he has the capital invested in tractors, planters, a harvester, trucks, a dryer, and storage facilities—and he is told, "You can't participate in the target price program unless you reduce your acreage to 150 acres," he knows his cost per ton must go up. His fixed costs will have to be spread over fewer units of output. It sounds fair to let everyone share in producing the rice we need, but the sad fact is that a great deal of our efficiency is lost.

Now I realize that if one talks about agricultural efficiencies in anything approaching industrial terms, the door flies wide open to criticism that you are ignoring the human equation, that the small family farm is the target of your policy proposal, that you have no heart for the rural areas of America, and that you threaten basic values that are vital and essential in our society, our culture.

When one compares our acreage production cutbacks with cutbacks in industry, the difference is apparent. Example: Company A manufacturing widgets in two factories becomes faced with a global widget surplus and a 50 percent cut in demand. What do they do? If they used the acreage reduction program of our farm programs they would reduce each plant's production by half. But if they did that the

cost per widget would go up. It would be far higher than if they closed down one plant, the least efficient one, and operated the remaining plant at full capacity.

Let's further assume that the company's management, with great concern over the employees and the communities involved, decides to operate each plant at 50 percent, thereby spreading the suffering. Suddenly, they find that even though their costs are higher, the market price for widgets goes down because a competitor, Company B, is running its most efficient plants at full tilt, seeking to be the world's most efficient. Company A cuts from 50 percent to 60 percent and so on and on. Company A may eventually have to shut down both plants or additional inefficiencies are forced.

I agree with the critics. One must not try to develop a farm policy that would emphasize efficiency of production and improved competitiveness without recognizing where the U.S. agricultural community has been, where it is today, and where we would like it to be. In adopting policies that are even partially clear as to where we would like to be, those who would be disadvantaged in the farm factory that is closed must be considered. But it must also be recognized that the most efficient farm may not be the largest and the most inefficient farm may not be the smallest. There is some evidence to suggest that the small family farm may be the one that has been and still is being disadvantaged by the farm policies we have followed.

With stocks as large as they are, and target prices as high as they are, we are, sadly, going to need to continue to have these inefficient acreage reduction programs. But we should, I would hope, begin to see that there is a better way. We should phase out acreage reduction programs and allow those that can produce more efficiently to do so. This in combination with the new loan policy could, in a few years, pay big dividends in restoring our exports and give the economies of rural America a big boost. We must make these changes soon, before our competition further increases its market share and makes U.S. agriculture less efficient.

The 1985 farm bill is once again an omnibus bill with close to two dozen titles. It touches sugar, dairy, wool, wheat, feed grains, cotton, rice, peanuts, soybeans, trade, conservation, farm credit, research, extension, food stamps, nutrition programs, and it even establishes a National Agricultural Policy Commission.

A number of these titles continue programs very much as they have been in the past. Some changes that should have been made were not

made. And some changes that were made should not have been made. But it was ever thus.

Because this symposium is focused on the world marketplace, I have not attempted to talk about those parts of the omnibus farm legislation that involve the commodities we produce largely for domestic production. Some of these, like our dairy and sugar programs, are highly protectionist. Others, like honey, open the door to imports and discourage domestic consumption (though not domestic production) of the U.S. product. What I have tried to address are policies for our major export crops—wheat, corn, cotton, and rice—crops that have, to one extent or another, lost their competitive edge, partly through our farm policies.

There are, of course, a number of other factors that importantly affect farm trade. Other speakers here will address such things as the impact of macroeconomic policies and international trade policies, including tariff and non-tariff barriers. If one or more of these policies are wrongheaded from the U.S. farm export point of view, it will, to one extent or another, affect the competitiveness of U.S. farm products.

Reliability: an essential factor

Even if all of these major or minor factors were shaped as favorably for exports as we could wish, we would still have a less than perfect competitiveness if we neglect one factor important to our buyer. That is reliability. Foreign buyers of our farm commodities must be absolutely assured that the deliveries of what they need will be invariably and reliably made.

President Reagan came to an early understanding of this in his first term. He not only ended the Soviet grain embargo but, on March 22, 1982, he proclaimed a new U.S. policy on agricultural exports. Let me remind you of his statement that, "In the past eight years, our stop-and-go export actions have weakened our reputation as a reliable supplier. If we are to take full advantage of our agricultural resources, we must establish a clear policy for the benefit of our farmers, those who market our crops, and those who buy our commodities at home and abroad."

The President went on to say, "For this reason, I am presenting today the U.S.'s long-term policy on farm exports. The agriculture export policy of the United States will ensure three essential priorities:

First, no restrictions will be imposed on the exportation of farm

products because of rising domestic prices. Farm prices go up and farm prices go down. High prices signal market-oriented farmers to produce more, and they will, if we allow them to compete freely in export markets. This is best for everyone, from farmer to consumer.

Second, farm exports, as I have already indicated, will not be used as an instrument of foreign policy, except in extreme situations and as part of a broader embargo. Agricultural commodities are fungible; that is, they are easily interchanged for the same commodity from other nations. For this reason, the embargo of 1980 was almost totally ineffective. Yet it caused great economic hardship to U.S. agriculture. We will not repeat such action.

Third, world markets must be freed of trade barriers and unfair trade practices. We must continue to pursue this objective aggressively. World economic health will be improved and strengthened by freer agricultural trade. Our great agricultural system must be turned loose to benefit not only Americans but people throughout the entire world."

This statement of policy has been widely heard. I can tell you that it has been translated into dozens of languages and read carefully all over the globe. But there is an aged expression that people remember, "Handsome is as handsome does." To be known as reliable, we must actually be reliable and keep it up for a long time. After all, no national leader can risk depending on imported foods or fibers if the reliability of supply is not absolutely certain. It is vital that everyone involved in our U.S. policy formation have a clear understanding of the importance of reliability.

Do we neglect quality?

Another factor of growing importance is export quality. More and more frequently we hear foreign buyers charge that U.S. products are inferior to those of a competitor. Some of these claims are invalid, as is always true in trade. But I suspect some are fully valid and reflect a lack of effort on our part to be as vigorous as possible in learning what quality our foreign buyer wants and then providing it for him. It may be in the raw product itself. Perhaps the farmer is still growing a quality that is not quite good enough. But has anyone told him what is wanted or paid him to improve his quality?

Quality demands are changing at home and abroad at an unprecedented pace. **U.S.** agriculture must sharpen its understanding of this and move rapidly, at the very least, to keep up with the competition.

Conclusion

When I attempt to wrap it all up, to summarize this talk on **U.S.** agricultural policy and its impact on enhancing our competitiveness, I come, **regretfully**, to the conclusion that while some of our policy modifications may improve the nation's competitiveness, there will continue to be grievous problems that will require attention in the days ahead. And although our agricultural policy plays a major role, even if we were wise enough to design and implement a perfect **U.S.** policy, it would be insufficient unless domestic and international economic and trade policies were harmonious.

Commentary on 'Enhancing Competitiveness: U.S. Agricultural Policy'

Harold F. Breimyer

My comments consist of ten observations that I make briefly and to the point. For the most part, they do not take issue with Mr. Lyng's presentation. I will stress, however, how little is known for certain about the foreign world where trade in farm products is concerned.

First, I draw on my long association with farm programs, which began in August 1933 as I worked for the Agricultural Adjustment Administration. As early as the 1930s I heard a number of the objections to programs that are commonplace today and are included in Mr. Lyng's remarks. We were told early that we were pricing ourselves out of the world market, and that our price supports were supporting not only our own farmers but farmers all over the world. I do not suggest that these observations were entirely wrong then, nor are entirely wrong now. But they become a sort of chant, a litany.

Second, the big world outside our national boundaries carries an air of mystery. We understand trading on our own soil, but that big murky void 'out there' is hard to fathom. Moreover, it is often thought of as a big black **hole into** which all our surpluses can be dumped and our problems resolved. George Peek had such an idea in 1922. The export debenture proposal was circulated in the 1920s. I even think export-PIK has a little of that philosophy in it—the idea that the foreign world can somehow be induced to take our surplus products.

Third, we do not know much about the coefficients of demand and supply in world trade in commodities. Any intrepid economist is at liberty to advance his own estimates, confident that they cannot be refuted. A wide range of figures is being bandied about. I am not sure it is useful even to try to compute elasticity estimates. Data of that kind fit our market but may have little validity on the world scene.

Fourth, lacking a clear understanding of the trading world, we draw our favorite mental pictures. I am pleased that Mr. Lyng does not use the term, "world market." I wince whenever I hear it. I use the language of economists to remind that it is not possible to **extrapolate** from the micro to the macro. The experience of the Andersons, Continental, and Cargill in rivalry for grain sales is germane with regard to current transactions but does not tell us much about the makeup of, or evolutionary trends in, world trade. In the compass of our planet there is no "world market" as the equivalent of the Kansas City Board of Trade.

Fifth, I have become impressed with how politicized world trading is. Almost every country maintains a capacity to influence the terms of trading—buying and selling. Few countries really trust open market pricing as a world equilibrating instrument, and certainly not in a market-clearing sense.

Sixth, Mr. Lyng asks that farm exports not be "used as an instrument of foreign policy: then quickly adds an exception. In my judgment, he should add lots of exceptions. We do use export trade as an instrument of foreign policy. We deal differently with our good friends than with our lukewarm friends or our non-friends. We are not likely to offer export-PIK to Mr. Khadaffi. Nor, for that matter, are we likely to use our power in soybean trade to grind Brazil into the dust, nor our power in feed grains to turn the vice tight against Argentina, a nation struggling with democracy. We would address trade problems more usefully if we would be honest about the political element. It is there.

Seventh, do our price supports impede sales? Sometimes. How much? No one knows. But for any analysis, we must first convert the support price in dollars to the equivalent in the appropriate foreign currency. In the last few years, support prices have not been the impediment of first importance. That unwelcome status attaches to the exceptionally high exchange value of the U.S. dollar, and to the overblown size of the 1983 PIK program. (I did not object to PIK, but I said then, and say now, that it was too large.)

Could we sell all our stuff at a sharply reduced price? Only if our competitors did not reduce price alongside us. Do we want to start a world fire sale? I do not think so.

My next comment does not quite fit the above sequence but I endorse fully Mr. Lyng's concern about quality standards. For five years, I was economist for the Agricultural Marketing Service. I remember vividly how embarrassed I was that my administrator should take so much heat when he tried to tighten standards for export grades. The

exporting companies, including cooperatives, violently opposed any change.

Ninth, my mental picture of world trade is one of price leadership. In my judgment, the United States exerts price leadership for corn and soybeans. We establish the price. Other countries only nibble at the edge. For rice, my guess is that we have relatively little influence. I cannot decide where we stand with regard to wheat. The wheat trade seems to defy rational characterization. This means we have a considerable latitude in pricing policy for feed grains and soybeans, little for rice, and some degree of influence in wheat.

And finally, the really central part of the world topic—the one genuine verity—is that making export pricing hostage to internal price supports is a major obstacle, and the more so insofar as we try to choose the price supports to conform to goals of income for farmers. One way to dig out of the dilemma is to end all commodity price supports. That will not happen.

I must insist that the matter cannot be resolved by legislating support and release prices every four years—or even every year. Two years ago, the proposal was advanced that an export authority be set up to play the game of world trading. It would not be tied closely to price supports. It would be free to two-price, and it would require considerable funding. The proposal has not been discussed lately, but I regard it as an idea whose time will eventually come.

With or without an export authority, any program must include provisions for year-to-year carryover stocks. Radical notions are sometimes advanced, calling for an end to all Commodity Credit Corporation storage. That would be a calamity. Only the government is in position to keep a reserve stock on hand as a way of guaranteeing continuity in our ability to send our farm products overseas.

Enhancing Competitiveness: International Economic Policies

Graham J.L. Avery

The United States is the world's leading exporter of agricultural and food products. The European Community is the world's leading importer of such products, and it is also one of the U.S. farmers' best customers. Even in fiscal 1984, with the strong dollar discouraging U.S. exports, the European Community bought \$6.7 billion worth of U.S. farm products and ran a farm trade deficit of \$3.6 billion with the United States. It is proper, therefore, that a symposium devoted to the world's agricultural marketplace should bring together representatives from both sides of the Atlantic to examine the present situation and prospects.

This paper sets out some reflections, from the point of view of a European, on the issues that face us. We both have a dynamic modern agriculture, enjoying the benefits of technical progress that have caused rapid increases in production in the last decades. Consequently we are both more and more dependent on exports for the marketing of our production. But we both face severe difficulties of demand on world markets, resulting principally from slow economic growth in the importing countries. In the case of the developing countries, the lack of demand stems not from a lack of mouths hungry for food, but from desperate problems of indebtedness on the external account and an incapacity to pay.

It follows, therefore, that the biggest contribution we could make to the stimulation of international demand for food products is action on a scale wider than agriculture to create a better economic order by promoting world development. The prescriptions of the Brandt report, including a combined effort by the rich countries to step up development aid and a reform of the international financial system, remain unful-

filled. This is a challenge that above all faces the United States, Japan, and the Europeans. We can never solve our problems of agricultural trade by agricultural actions alone. We need, on the part of our leaders, a much wider effort of political will.

In Europe, we are conscious of a historic precedent, created through the foresight of the United States. From the ruins of the war, in which we Europeans exhausted ourselves politically and economically, the Marshall Plan helped us recreate our productive capacity. It provided conditions in which at last the nation states of Europe could embark on the path of political union—a path we are still treading, as in January 1986 Spain and Portugal join the existing ten members of the European Community (Germany, France, Italy, Britain, Holland, Belgium, Luxembourg, Denmark, Ireland, and Greece). For the United States, it was an act of enlightened self-interest that permitted stability and growth in Europe and laid the foundations for a transatlantic understanding that has helped us both to make the world a safer place. It is for similar reasons that, 40 years later, the rich countries of the North need to aid our partners of the South.

This reflection of a global nature is a necessary preface to an examination of the agricultural aspects of the international economic environment. The examination is presented in this paper in two parts. The paper itself sets out some considerations of an economic and political nature concerning the international economic environment in which agricultural trade takes place, the interaction of agricultural policies, particularly of the United States and the European Community, and possible future scenarios. This paper also contains an appendix of a statistical and analytic nature concerning the development of world agricultural trade in the 1970s and early 1980s and the prospects for the future, taking account of recent studies, particularly of the cereals sector.

The international economic environment

Two important conclusions may be drawn from the experience of the last decade in international agricultural affairs: agricultural policies have become more and more open to influences of a general nature and the traditional rules for handling international agricultural questions have been less and less adequate for coping with the problems.

Linkages between agriculture and the general economy

Although agricultural trade has increased less rapidly than trade in

manufactures, it has certainly expanded; and as in the manufacturing sector, there has been increased specialization. The "mixed farming" enterprise is giving way to monoculture or specialized livestock units with their economies of scale. Increased capitalization has involved the farm sector with financial institutions — to the point where in some parts of the United States it is the banks that depend on the farms rather than the farms on the banks. The growing dependence on world markets for disposal of exportable surpluses — and this has been the experience of both the United States and the European Community — has brought agriculture up against the same problems of monetary instability as confront manufacturers. Finally, the large budgetary outlays that central government has devoted to support of agriculture have brought agricultural policy directly into the firing line as finance ministers grapple with budget deficits.

These linkages help explain why in the 1970s and 1980s farm policies on both sides of the Atlantic ran into turbulence as monetary instability, inflation, and high interest rates accompanied the deceleration of growth in incomes and employment. The traditional reaction, to isolate the agricultural sector from such undesirable fluctuations, was neither appropriate nor possible.

Of all these factors, one may perhaps single out monetary instability as the most pernicious, in the sense that it showed the policymakers least able to find a rational solution. In the European Community, the combination of a common price level for agricultural support (expressed by the fixing of prices in 'units of account') with sharp variations in the value of the European currencies against each other led to the creation of "monetary compensatory amounts" that act as taxes or subsidies on farm trade. When these amounts reached the order of more than 15 or 20 percent, they threatened to destroy the common market. But the success of the European monetary system since 1979 in creating a zone of monetary stability within Europe — with periodic, but limited, adjustments of our currencies against the European Currency Unit (ECU)—has much reduced the scale of the problem.

For the United States, monetary instability has had other effects on farming in the 1980s. In the 1970s, there was an enormous growth in U.S. agricultural exports, stimulated by a weak dollar. But then government deficits, accompanied by the inflow of foreign money, drove up the dollar, which had the consequences one might expect on trade, making U.S. farm exports less competitive. On the large share of U.S. farm production going into export, it had the effect of reducing volume

and receipts. From the point of view of an observer on the other side of the Atlantic, this appeared to be a classic case of the Americans shooting themselves in the foot as regards agricultural trade policy. Now that action has been taken to bring down the rate of the dollar—and this was to some extent in response to representations from the Europeans—one could wonder whether we have not done the same trick.

Deficiencies of the international trade rules for agriculture

The rules of the General Agreement on Trade and Tariffs (GATT) governing agricultural trade can be categorized in two parts: rules concerning access for imports and rules concerning competition in export.

Access. With some risk of oversimplification, one may say that there is a basic rule regarding access, to which there is one basic exception. The basic rule is that a country can protect itself only by means of border tariffs and nothing else. The basic exception is that, for agriculture, a government can apply quotas in addition to or in place of tariffs, on the condition that it restrict its production and import at least a minimum quantity of goods. Now these conditions are not difficult to respect, since nobody has ever determined what exactly constitutes a production restriction or a minimum quantity.

Furthermore, the biggest and most powerful trading partner in agricultural goods opted out of the rules at the time they were drawn up—that is, the United States, which obtained a waiver on some of the major rules regarding imports. This waiver or exception, although supposedly temporary, was introduced in 1955 and still exists.

Exports. Here again the rule is fairly simple. Export subsidies for agricultural products are tolerated on condition that they do not result in the country that applies them having more than an equitable share of the world market or in undercutting prices. Since an equitable share for one country tends to appear an inequitable share for its competitors, and prices by their nature fluctuate, irremediable differences of opinion have arisen as to the interpretation of the rule.

These remarks are not intended to decry the existence of GATT. Winston Churchill said of democracy that it was the worst form of government, except for all the alternatives; and so it probably is with GATT. What is worrying is a situation where one or the other partner feels increasing frustration with its operation and is tempted to take action to remedy grievances outside the multilateral context—in bilateral or even unilateral actions damaging to the other partners, who will

subsequently and almost inevitably take further countermeasures. This is plainly a reason for including agriculture in a future round of trade negotiations in GATT, with a view to making the rules operational in ways that are acceptable to all parties.

Interaction of agricultural policies

It is not an exaggeration to state that, among the principal hallmarks of the government of an independent nation state is its wish to defend its territory and to feed its people. From this basic and honorable ambition flow directly the concepts of a defense policy and an agricultural policy that, by an inevitable law of economics, lead sooner rather than later to taxation. To put it another way, there is no developed country in the world that does not have an agricultural policy of some kind, and in the body politic of the nation, this particular element is usually one of the more vital organs. From such a consideration it follows that, in designing and developing its agricultural policy, a country generally gives priority to the interests of its own people, including both its consumers and producers of farm products. The interests of other countries figure in a secondary place. This remark is not intended to be polemic; it is a simple observation of what actually happens, particularly in democratic countries. Those of us who observe the progress of the U.S. Farm Bill do not seriously expect it to be designed in the first place to meet the needs of other countries. In the same way, the reform of the Common Agricultural Policy (CAP) on which the Europeans are embarked must naturally respond to our own political imperatives; and it would be surprising if one imagined otherwise.

But this is not to say that farm policy decisions on both sides of the Atlantic are conducted in a crude beggar-my-neighbor fashion. It is rather to say that trade policy considerations do not normally take precedence over such objectives as the maintenance of stable prices and farm incomes or the limitation of farm budget costs. It is certainly true that trade in agricultural products is generally affected more by domestic governmental policies than trade in industrial products—not only because of the special nature of agricultural markets (variability of supply and inelasticity of demand).

How then should we view the interaction of agricultural policies in the international environment? Perhaps the most positive line of analysis is to consider what similarity of interests exist between the principal actors on the stage—and in this context that means the United

States and the European Community—so as to discern which of the possible responses to domestic political imperatives are likely to frustrate or to further the shared objectives. One may suppose that such an approach is more likely to lead to satisfactory conclusions than an approach based on the idea that the best way to deal with competition is to tell it to go away. This approach is not unknown among farm organizations, whether in Europe or the United States, that may too easily convince themselves that, if there are difficulties with exports, it is because the foreigners are breaking the rules.

If one addresses the questions of similarity of interest, it is rather striking that the conduct of farm policy at the present time on both sides of the Atlantic appears to be based on the objectives of a more market-oriented policy and a limitation of budgetary costs. These, at least, are the themes that figure most often in public declarations, though both sides are faced with the delicate problem of reconciling such objectives with the considerations of farm income.

U.S. agricultural policy

It is well known that the Farm Bill currently before Congress faces a number of conflicting requirements. To meet budget constraints and remain competitive in export markets, support prices should be reduced. But to avoid large-scale farm bankruptcies, income support must be provided. Within a rather short space of time, we should know whether the President will veto the package now emerging from the deliberations of the House and Senate—a package that is certainly on the high side in budgetary terms and could have an important influence on the U.S. budget deficit in the medium term. In the longer term, we shall see what effect it has on U.S. competitiveness in the world marketplace through lower prices. Rather less, one suspects, than in the administration's original concept. But there are two other considerations of a more short-term nature that are of concern to observers in Europe.

The first is that, whatever happens, this legislation will not take effect until 1986 and will not have much influence on the disposal of this year's harvest. But this year's harvest is of very immediate interest—there are large carryover stocks and substantial new crops, in both Europe and the United States, while the Soviet Union is expecting a better harvest.

The second consideration is that, independently of the Farm Bill, the United States is faced with a choice of whether to become a regular

subsidizer of farm exports. The administration's Export Enhancement Program for agriculture took a long time to get off the ground—much to the frustration of Congress which demanded it—but now it appears to be in full swing. It cannot be categorized as anything other than a classic export subsidy program; and although it is limited in time, experience suggests that this type of measure, once it is put into operation, has a lot of staying power. Already there are demands to improve it by the inclusion of additional target markets, such as the Soviet Union. Already there are demands to attack not only the European Community, but other exporters, such as Canada and Argentina. Already the Russians have used the program as an excuse for not buying the minimum quantity of wheat specified in the U.S.-Soviet Union long-term agreement. But these are the details. The basic question is whether the United States intends to continue with this type of export subsidy and whether it is fully aware of the consequences.

The question poses itself, of course, not only in the agricultural sector but also in other sectors such as industrial goods where the Export-Import Bank is making its first allocations from the administration's so-called war chest to help exports of computers, transportation, and power equipment.

One of the consequences certainly has been a downward pressure on world prices, for the prices offered under the Export Enhancement Program have effectively undercut the European Community in certain markets. This obliged the European Community to follow suit to maintain its sales. Who benefits, therefore, from this kind of measure? And who pays?

Another consequence has been to mobilize criticism of the United States not only from the European Community, which was originally the principal target competitor, but also from other agricultural exporting countries. The chairman of the Australian Wheat Board, for example, has strongly attacked the United States for its subsidized sale of wheat to Australia's number one wheat market, Egypt; he described the U.S. action as 'economic lunacy,' and said the United States was hypocritical in claiming to use the Export Enhancement Program to justify attacking the European Community's export subsidies.

Finally, the U.S. action largely undermines the credibility of the recent decision of President Reagan to initiate proceedings under GATT against the European Community's wheat exports. It is not surprising that the reaction on the European side has been astonishment that we are reproached for having depressed world market prices for wheat,

and the announcement of our own challenge to the 'Export Enhancement Program in GATT.

It is all the more ironic that these developments come at a time when analysts on the U.S. side are increasingly pointing to factors other than the European Community as principally responsible for the decline in U.S. exports. Even the U.S. Wheat Associates, in recent testimony to the House Agriculture Committee, listed the following factors which it considered to have caused this decline.

- The value of the U.S. dollar.
- World economic stagnation.
- Debt problems in client countries.
- World wheat prices below those of the United States.
- U.S. trade policy such as embargoes and import restraints.
- Cargo preference.

Common agricultural policy of the European Community

It is not the object of this paper, however, to examine a catalog of current United States/European Community disputes in the agricultural sector. The bilateral questions concerning citrus, canned fruit, wine, or pasta are—we hope—short-term problems that can find durable solutions through responsible decisions on both sides. For wine, the International Trade Commission has recently defused the issue by rejecting the complaint of producers against wine imports from Europe. For the analysis of the international economic environment in which U.S. agriculture has to live, it is probably more useful to describe some of the underlying developments on the European side that will have an influence on our farm policy in the medium term.

The European Community has presided over a spectacular success in the development of agricultural productivity in the last 25 years. To what extent this explosion of production, at an annual rate of the order of 2 percent, has been due to the decisions of politicians or policymakers is a matter of debate. It is probably the backroom experts in agricultural research and development that have made a more profound, if less publicized, contribution to the surge of production. However, it is certainly the case that the framework of price stability created by CAP has permitted Europe's agriculture to develop its productive potential rapidly.

But meanwhile our demographic structure in Europe, with a gen-

eral decline in birth rates, leads to an annual increase of only about 0.5 percent in domestic consumption at best.

These divergent trends have brought CAP to a crisis that has become increasingly severe in the 1980s. On the one hand, the budgetary costs of the farm policy, borne by European Community funds, have increased at a time when those same funds—the European Community's 'own resources'—have reached the limits set in existing rules. On the other hand, the increasing share of the European Community's production going into world markets has brought us into conflict with trading partners.

It has not been easy to persuade the European Community's decision-making body—the Council of Ministers—to take effective action to control the situation. The principle has been accepted in recent years that, if production exceeds a certain level, then the farmers should participate in the cost of disposal of production beyond that level; in other words, that the unlimited price guarantees originally provided under CAP should be subject to certain disciplines. However, the measures to be taken to apply these disciplines have not proved easy to put into practice. This was notably the case in 1985, when the Council of Ministers was unable to agree on how to apply the reduction in cereals prices that should have automatically resulted from the 'guarantee threshold' for cereals being exceeded. In the end, in the absence of a decision, the European Community's executive body—the European Commission—was obliged to step in to apply on an interim basis a price reduction of 1.8 percent.

Despite these difficulties, the European Community has pursued a restrictive price policy under CAP in recent years, with reductions in the level price support in real terms after account is taken of inflation. It has also introduced a quota system for milk production, that led to a decline of 5 percent in supplies in the first year of application. Europe's farm organizations have not easily accepted these measures at a time when milk production in other countries is increasing; they note that U.S. exports of subsidized dairy products, especially milk powder, have expanded rapidly. (Although rarely attaining 15 percent of world trade up to 1982, they now account for more than 25 percent, and this gain has been largely at the expense of the European Community.)

In July 1985, the European Commission published a 'green paper' on the perspectives for CAP in which it underlined the need for a more market-oriented policy and set out some of the options for achieving this policy. From the debate that has taken place on the basis of this

consultative document—that covers a whole range of themes—two points are worth mentioning.

First, at the level of the Council of Ministers—and in this case that means the Ministers of Agriculture—there is a virtual consensus that the development of CAP must take account in the future of both the international constraints and of the domestic budgetary constraints. The explicit acknowledgment of these two elements, which in the past have tended to be sidelined in policy discussions, is an important political fact.

Second, at all levels, there is agreement that action is urgently needed to reform the European Community's cereals policy, which is running into real problems. Evidently the action to be taken on cereals will have important consequences in the medium and long term for U.S./European Community relations. While the European Community does not accept that its restitutions or 'subsidies' have resulted in its taking an unfair share of world cereals markets, it is conscious that the divergence between trends of European cereals production (currently about 140 million tons and rising at an average rate of 2 to 3 percent a year) and consumption (around 117 million tons and rising much less rapidly) will lead to exportable surpluses of a magnitude that neither the world market nor the European Community budget could realistically be expected to bear.

The commission is likely to propose, therefore, a package of measures for cereals, drawing on the elements already outlined in the green paper. These include a restrictive price policy, a more limited use of intervention on the internal market, revised quality standards to avoid the arrival of quantities of feed wheat in public intervention stocks, and a 'co-responsibility levy' by which cereals growers would pay all or part of the cost of disposal of surpluses beyond a certain point.

Possible scenarios for the future

With the prospect of a major international trade negotiation in GATT in 1986 and for which the preliminary discussions are already under way in Geneva, it is essential to look at the possible scenarios that could evolve. At this stage, none of the parties have worked out their position on agriculture in detail. Indeed, in the short term there are continuing disputes, not least between the United States and the European Community, that are clouding the atmosphere in the agricultural sector and also in the case of industrial goods, where steel is a notable example.

Altogether, the United States and the European Community share a two-way bilateral trade flow of \$100 billion. We are each other's biggest customers. Only a small proportion of this bilateral trade flow gives rise to problems, and we must avoid a situation in which they spill over into our wider trading relationship, with all the damage that could be caused. Moreover, on both sides of the Atlantic, we know that our economic well-being depends on the existence of open markets for our exports. To give in—especially at this stage—to the protectionist pressures to which our public authorities are subjected would be a disaster. It need hardly be said that a wave of protectionism would be particularly disastrous for the U.S. farm sector, dependent as it is on exports.

That is why the European Community has recently taken steps to accelerate the tariff reductions agreed in the last multilateral negotiations. That is why we applaud the stand the U.S. administration has taken against protectionist tendencies in Congress. Two further remarks, which go wider than agriculture, are also in order.

- Progress in the monetary field should be sought in parallel with progress in the trade talks, to avoid disruptive currency movements that undermine or even negate achievements in the trade field. There is not much point in seeking solutions by trade negotiations to problems with root causes in the monetary and financial fields.
- In future trade talks, the cooperation of the United States and the European Community will continue to be crucial, but a special responsibility must fall to Japan, which must show a willingness to assume its fair share of the burden for supporting the open multilateral trading system, in line with the benefits which Japan has drawn from it, particularly for manufactured exports.

On the side of the European Community are a number of basic assumptions that are necessary in our approach to negotiations on agricultural trade. These are that they will:

- Maintain its position on world markets for import and export of agricultural products. We cannot enter a negotiation, for example, on the basis that our agricultural sector will be sacrificed in the interest of other sectors of economic activity which are important for the trade balance.
- Retain a system of variable import levies and variable export re-

funds as a mechanism for stabilizing its internal agricultural market. This does not exclude improvements and adjustments to the mechanisms in the interest of more orderly world trade, but it does mean that the European Community, which has paid with concessions in earlier negotiations for the right to apply these mechanisms, will defend its rights.

- Keep the concept of "Community preference" in the agricultural sector, that is, the transposition at the European Community level of the priority given to domestic produce on national markets.

Within this framework, the European Community accepts very well that its expanding role in world trade in agricultural products gives it a responsibility toward the world market. It has become the major exporter of dairy produce and beef, the second exporter of cereals and sugar, and a leading exporter of wine, spirituous beverages, and processed products. As regards relations with the United States, however, this calls for two remarks.

- The European Community is not in fact a competitor for most U.S. farm products on export markets. Some 75 percent of U.S. farm exports are products where competition from the European Community is either nonexistent or indirect, for example, soybeans, cotton, and corn.
- Most U.S. farm exports enter the European Community free of import charges. In 1984, despite having ample supplies of its own cheap feed wheat, the European Community imported free of levy or duty one-third of all U.S. soybean exports and almost half of all U.S. soybean meal sales overseas.

Exports

It is part of the European Community's approach to reforming farm policy that our own agricultural producers must participate in the cost of disposal of production beyond a certain point. The practical implication of this for exports of products for which we are a principal actor in the world markets is that there should be arrangements whereby producers themselves can take over export risks. Schematically, this approach can be expressed in the following ways:

- Restricting the price and disposal guarantees granted by the European Community to specific quantities, beyond which disposal at

world market prices would be the responsibility of producers. This could be implemented either by means of a quota on production or a levy paid by the producers. Although the European Community already has production quotas for sugar and milk, it would not be desirable to extend these types of physical limitations to other sectors. Therefore, a levy paid by the producers to cover some or all of the export costs (co-responsibility levy) seems the more likely course.

- In the longer-term, fixing European Community support prices at levels closer to those of other exporting countries. This would be logical, especially for products where the world market accounts for a significant part of the European Community production.

Imports

When the European Community set up its import system 20 years ago, it opted for a protection based on variable import levies for the staple farm products and little or no protection for products for which at the time it was far from self-sufficient. It negotiated this system in GATT, the concession of freedom to impose import charges on certain products being offset by the reciprocal concession of low or nil protection "bound" in GATT for other products. Thus, there is little or no external protection against imports of vegetable fats, vegetable proteins, and certain energy products for animal feed. This negotiated system has had two main consequences for the European Community.

- It has had to introduce in its arrangements for many products either consumption aids (to enable the European Community product to compete with corresponding imports) or production aids (deficiency payments to support the farmers' incomes). This has been the case for olive oil, oilseeds, butter, skimmed milk powder for animal feed, and certain processed fruits and vegetables.
- Imports of products subject to low or zero protection, especially various feed stuffs, have expanded considerably because of their price advantage and have discouraged the use of European Community cereals in animal feed. This, in turn, has contributed to the surpluses of livestock products and cereals.

As agricultural output in the European Community has increased, the subsidies resulting from these factors have become more and more costly for the budget. The imbalances in our external trade system

have also contributed to the artificial maintenance of production structures and trade flows that owe their existence largely to the difference in prices for competing products.

Is there a way of changing this situation? One approach under GATT rules might be a **tradeoff** between high protection and low protection, without increasing the average level of protection of European agriculture. This would make it possible to diversify agricultural production and uses of agricultural products in the European Community, achieve budget savings, and reorient the European Community's price policy in a more rational way.

On the U.S. side, such an approach also deserves reflection. It is not always recognized that serious imbalances exist in the U.S. external trade arrangements, which cause distortions within the U.S. farm sector and spill-over effects on world agricultural markets. With the benefit of the waiver in GATT concerning U.S. imports, high rates of effective protection are maintained for several products.

For example, there is an import quota for sugar, whose protective effect has been reinforced by the recent reductions in the level of the quota. Meanwhile, the support for corn is relatively moderate. Consequently, under the umbrella of the high sugar protection, the production of corn sweeteners has developed profitably and rapidly. This has had consequences on the external trade front. U.S. raw sugar imports have been reduced from a high point of 5 million tons at the end of the 1970s to less than 2 million tons in 1985-86, leading to considerable difficulties on the international sugar market, which has thus contracted from about 20 million tons to 17 million tons. There has also been an increased production and export of corn gluten feed, which profits from the imbalance in the European Community's own trade arrangements.

Another example is the high level of support given to U.S. milk production, combined with the relatively low price of animal feed. This state of affairs has consistently frustrated the administration's efforts to control milk production and has led to the accumulation of very large public stocks of dairy products and subsidized sales by the United States in a world market already suffering from grave oversupply.

The foregoing remarks are a long way from the philosophy of "free trade" that is commonly believed in U.S. circles to be the sovereign remedy for agricultural difficulties. The facts of international life are rather different, notably because of the domestic political imperatives that lead governments to intervene in agricultural markets. While it

may be possible to demonstrate theoretically that free trade conditions would lead to adjustments within agriculture that could yield economic advantages in the long run, there is no evidence that democratically elected governments of the developed countries wish to make the sacrifices that would be necessary in the short and medium term.

Nevertheless, a better comprehension by the major agricultural exporters—including the United States and the European Community—of those objectives they share in their agricultural policies must lead to better cooperation. These objectives include a better control of production, particularly for products in oversupply, the limitation of budgetary expenditure, a more rational structure of external protection, a more market-oriented price policy, and perhaps above all the progressive integration of agriculture into the general economy.

The prospect of a new multilateral round of trade negotiations—against the background of poor prospects for expansion of demand on world food markets—must raise hope that trade tensions in agriculture will be alleviated. The challenge is to make the trends, which already exist in domestic agricultural policies, converge internationally in terms of accepted policy aims and procedures.

Appendix

The development of world agricultural trade

Introduction

The spectacular progress of world trade has been one of the most striking developments on the international scene in the last 25 years. World trade increased in volume by a factor of 3.5 during the period from 1960 to 1980, that is, at an annual rate of 8.2 percent. Agricultural trade meanwhile increased at a rate of 4.6 percent a year, a rate that although less than that of total trade was nearly twice the average rate of increase of world agricultural production (2.5 percent a year) during the period.

Table 1 shows the rate of growth in volume of world trade in agricultural products, broken down by product groups. Products for which trade increased most rapidly were, for the most part, sources of protein for human consumption (meat and dairy products) or constituents of animal feed (fodder cereals and oilseeds).

TABLE 1
Rate of Increase in Volume in World Trade
of the Main Agricultural Products, 1960-80

	<u>Annual Rate of Increase (percent)</u>
Meat	6.8
Dairy products	5.4
Cereals and cereal-based products for human consumption	4.0
Cereals for animal feed	7.6
Oilseeds and derived products	11.3
Fruits	3.2
Vegetables	2.7
Sugar	2.5
Textile fibers	0.0
Total	4.6

Source: OECD figures based on FAO statistics

Table 2 shows the development of world agricultural trade in volume for the main groups of countries from 1967-69 to 1983. The group of developed countries, particularly North America and Western Europe, more than doubled their agricultural exports, while their imports grew by scarcely a third. A quite different development took place in the case of the developing countries, whose imports practically tripled, while their exports increased by little more than a third. The state-planned economies saw their imports more than double, while their exports decreased.

Highlights of the 1970s and the early 1980s

In the 1970s, world agricultural trade increased more rapidly than in the 1960s. But despite this rapid expansion, agricultural markets experienced greater instability. In fact, five of the eight principal disturbances recorded since 1945 took place between 1972 and 1980.

In addition, the trade flows polarized around three principal lines of development.

- The increasingly dominant position of certain developed countries in world exports, particularly North America. Between 1970 and 1982, nearly two-thirds of the additional cereals entering

TABLE 2
Development in Volume of World Agricultural Trade
According to the Main Regions (1967-69 = 100)

	Imports			Exports		
	<u>1974-76</u>	<u>1978-80</u>	<u>1983</u>	<u>1974-76</u>	<u>1978-80</u>	<u>1983</u>
Developed countries with market economy	121	134	138	152	203	223
North America	112	116	116	159	226	234
Western Europe	122	137	142	160	208	250
Centrally planned economies	161	216	232	99	98	98
Soviet Union and Eastern Europe	165	205	224	97	95	93
Developing countries	144	225	271	109	123	138
Africa	146	241	298	100	87	89
Latin America	149	248	267	112	135	150
Near East	206	337	476	100	95	126
Far East	121	156	188	121	150	171
Total	130	161	176	128	175	

Source: Based on FAO statistics

world trade came from this region, more than half of the increase being attributable to the United States.

- The growing dependence of the majority of developing countries on food imported from elsewhere. The developing countries alone absorbed more than 85 percent of the increase in world cereals imports between 1972–73 and 1982–83.
- The appearance on world agricultural markets from 1972 onward of a new actor destined to play a fundamental role in the increase of trade but also in the instability of markets—that is, the Soviet Union. Following a series of disastrous harvests, the cereals imports of the Soviet Union went from 4 million tons in 1971 to 16 million tons in 1972 and to 24 million tons in 1973, then fell to 8 million tons in 1974 and increased to 17 million tons in 1976.

This growing polarization of trade, particularly for cereals, also appears in Table 3, which shows the main changes in the structure of world trade in cereals during the last half-century. Before 1939, only Western Europe imported more cereals than it exported. Today, Western Europe is, with North America and Australia, a net exporter of cereals. On the other hand, Africa, together with Eastern Europe and the Soviet Union, who before World War II were all self-sufficient or even net exporters, has become a net importer of increasing quantities.

Since 1960, the market for coarse grains has shown greater dynamism than that for wheat, which evidently results from the spread of animal feeding systems based on the use of concentrates. World trade in coarse grains, such as barley and corn, has more than quadrupled in two decades, first with increased demand in Western Europe and Japan, and then from the mid-1970s with demand from the centrally planned economies and the developing countries.

But since 1981–82, there has been a distinct slowing down of world cereals trade, affecting especially the developing countries and the centrally planned economies. This slowing down has been less marked for wheat than for coarse grains.

Another phenomenon of world agricultural trade in the 1970s has been the considerable increase in imports of cereals, particularly wheat, by China, especially since 1977. Because of increased urban demand and the appearance of grain deficits in rural regions, China's cereals imports went from 4 million tons in 1975 to 9 million tons in 1980. Several long-term agreements for the supply of cereals have been

TABLE 3
Development of World Trade in Cereals
(net exports (+) or imports (-) in million tons)

	<u>1934-38</u>	<u>1948-52</u>	<u>1960</u>	<u>1970</u>	<u>1980</u>	<u>1982-83</u>	<u>1983-84</u>	<u>1984-85</u>
North America	+5	+23	+38	56	+13	+118.2	+120.9	+118.2
Latin America	+9	+1	0	+4	-1	-2.3	-0.8	-0.9
Western Europe	-24	-22	-28	-30	-1	0	+2.9	+13.9
Economic Community	---	---	-7	-17+	-	+8.5	+10.1	+17.2
Eastern Europe and Soviet Union	+5	n.a.	0	+1	43	-36.6	-37.5	-47.8
Africa	+1	0	-2	-5	-8	-16.2	-26.2	-29.6
Asia	+2	-6	-17	-37	-2	-75.9	-72.5	-71.2
Australia and New Zealand	+3	+3	+6	+12	40	+9.7	+14.4	+19.4

*European Community of six member states, 1959-60 average

+European Community of nine member states, 1973

concluded in recent years between China and the exporting countries. However, most observers believe **that** the increases in imports by China are unlikely to continue, and it is more probable that they will stabilize around 10 to 15 million tons.

As regards the developing countries, their exports of agricultural products have increased less rapidly, both in volume and value, and since 1980 their agricultural trade balances have gone from surplus to deficit. This has aggravated their balance-of-payments problems. Among the developing countries, the rapid economic growth of OPEC and the newly industrialized countries has made them the principal new markets for agricultural exports of the developed world. The food deficit of the Arab region especially has greatly increased during the last two decades. In ten years, their cereals imports have tripled, and their imports of oils, eggs, and meat have increased even more rapidly. In these countries, the rapid population growth, accelerated urbanization, and increased incomes have transformed food habits. Combined with limited local agricultural production, this has led to a sudden increase of imports.

While agricultural trade in the 1970s increased at a steady rate, it slowed down in 1981 and 1982 with the world economic recession and the stagnation of effective demand.

Meanwhile, the structural surpluses in the producing countries became larger and more widespread because of the continued production increases. Thus, competition between the main exporting countries became more acute, which aggravated the depression of prices on world markets. Increased commercial aggressivity manifested itself in the development of long-term agreements often based on special measures for credit, in the greater use of subsidies, and even in the use of barter deals.

Prospects for the future

Numerous studies have been made in recent years of the future development of world production, consumption, and trade in agricultural products. The following paragraphs mention some of the principal studies and summarize their results in broad quantitative and qualitative terms.

Evidently, no forecast of agricultural trade can be made in isolation from forecasts concerning the development of the general world economic and demographic situation, and the prediction of such macroeconomic variables is particularly hazardous in a period of world

economic recession. Moreover, it must be emphasized that the results of such projections or forecasts are by no means neutral from the political and economic point of view. Insofar as they indicate what will happen in the future if certain hypotheses are fulfilled or if past trends continue, they can very well result in the political authorities taking decisions or initiatives that will modify the results of the forecasts.

Among the principal forecasts of medium and long-term agricultural developments are four reports that are summarized in the following paragraphs.

Agriculture, Horizon 2000: United Nations' Food and Agriculture Organization (FAO)

The first version of the **FAO** study was made in 1979, and after revision it was published in 1981. It focuses particularly on the developing countries and on three scenarios.

- A. More rapid growth (optimistic scenario).
- B. Small improvement in growth (less optimistic scenario).
- C. Continuation of present trends (pessimistic scenario).

For the developed countries, the annual rates of growth in agricultural production forecast in both Scenarios A and B are lower than the trend (1.5 percent). The developing countries, on the other hand, would have rates of growth in agricultural production in both scenarios higher than the trend (2.8 percent). But these scenarios assumed rates of growth of GNP in the developing countries (Scenario A: 7 percent and Scenario B: 5.7 percent), that now appear rather high compared with the average rate in the 1970s of 5.3 percent.

Table 4 shows the self-sufficiency forecasts for the main agricultural

TABLE 4
Self-Sufficiency in Agricultural Products
in the Year 2000 According to the FAO
(net exports (+) or (-) in million tons)

	Trend		Scenario A	Scenario B
	Developed Countries	Developing Countries	Developing Countries	Developing Countries
Cereals	+ 213	- 165	- 81	- 132
Sugar	- 13.5	+ 20.7	+ 20	+ 18
Vegetable oils	- 2.8	+ 6.0	+ 8	+ 7
Meat	+ 12.3	+ 3.0	- 1	0
Milk	+ 17.5	- 25.0	n.a.	n.a.

products in the year 2000 according to the different scenarios. The continuation of the trend implies an increase in surpluses for several products in the developed countries, despite the increase in the potential deficit of the developing countries. Meanwhile, in both Scenarios A and B, the deficits of the developing countries would be much lower. As regards cereals, the forecast deficits of the developing countries in the year 2000 (trend: 165 million tons, Scenario A: 81 million tons, and Scenario B: 132 million tons) should be compared with the historic deficits (1961–65: 17 million tons and 1978–79: 53 million tons).

The general conclusion of the FAO study regarding the cereal deficits of the developing countries—and particularly the most vulnerable countries—is that because of their lack of resources to finance such imports, only a massive increase in food aid would allow an increase in consumption and in levels of nutrition.

Global 2000: Report to the President of the United States by the Council of Environmental Quality and the Department of State

The Global 2000 report, published in 1980, studied the long-term consequences of present policies. The agricultural projections, derived from a USDA model, were based on three series of hypotheses.

- Variant 1—Continuation of present trends.
- Variant 2—Optimistic.
- Variant 3—Pessimistic.

The main conclusion of the report is that the world has the economic and physical capacity to produce sufficient food to meet the big increase in demand by 2000. However, production would have to increase at unprecedented rates merely to keep consumption per head at the level of the early 1970s. This implies substantial productivity gains and a pressure on natural resources.

As regards cereals, the volume of world trade in the year 2000 would be 220 million tons according to Variant 1, 178 million tons according to Variant 2, and 240 million tons according to Variant 3, compared with the average of 114 million tons in 1973–75.

The report concludes that only the most prosperous of the developing countries could satisfy their needs from the commercial market, while the poorer ones would rely more and more on food aid.

Interfutures: Organization for Economic Cooperation and Development (OECD)

This report, made in 1979, is based on six scenarios that aim to define the challenges facing the member countries of the OECD in the year 2000. As regards cereals, the OECD study forecasts a decline in the rate of increase of demand in developed countries and an increase in developing countries—mainly as a result of population increase. The report is optimistic concerning the resources available to meet the need forecast for the end of the century, except for some developing countries and the OPEC countries. In the long term, the cultivated area could be increased by 50 percent in the developed countries (except for Japan and Western Europe) and doubled in the developing countries (except for South Asia). The implied increase in yields (from 50 percent to 150 percent by the year 2000) would not be subject to biological limits, even in Western Europe; the energy requirement could be moderated by means of technological progress, allowing more efficient use; and supplies of natural fertilizers would be sufficient.

International Wheat Council (IWC)

In 1983, the IWC carried out an independent study of the long-term prospects for world production, consumption, and trade in cereals. It reckons that past trends no longer provide a sure indication of future development, because too many factors influencing production and consumption have changed in recent years. According to the hypotheses used for population growth, economic development, and the degree to which different countries attain their own objectives, world consumption of wheat would increase by 50 percent in the next 20 years. It would reach 2,180 million tons by the end of the century, compared with 1,451 million tons in 1980. This increase would be much slower than in the last two decades. Contrary to past trends, consumption of cereals for animal feed would increase less rapidly than for human use.

Table 5 shows the IWC forecasts for world trade in cereals, which would increase in the next two decades at a rather slower rate than recently, reaching a level of 265 million tons (27 percent more than the 1980 level). It should be recalled that between 1960 and 1980 it experienced a spectacular leap of 1980 percent.

TABLE 5
World Trade in Cereals According to
the International Wheat Council

	1980		2000	
	million tons	percent	million tons	percent
<u>Exports</u>				
Six main exporters*	190	91	248	93
Others	19	9	17	7
Total exports	209	100	265	100
<u>Imports</u>				
Developing countries	79	38	144	54
Low-income countries	23	11	64	24
Others	57	27	80	30
Centrally planned economies	68	33	52	20
Soviet Union, Eastern Europe, Cuba	54	26	27	10
China, East Asia	14	7	25	10
Developed countries	60	33	52	10
Total exports	209	100	265	100

*United States, Argentina, Australia, Canada, European Community (ten members), and South Africa

According to the IWC, the shares of world trade taken by the various groups will probably change markedly. Contrary to recent trends, the share of centrally planned economies could fall from 33 percent in 1980 to 10 percent in 2000, while that of developed countries would continue to fall, going from 29 percent to 26 percent. The imports of developing countries would practically double, with their share reaching 54 percent, compared with 38 percent in 1980. The low-income countries would be largely responsible for this increase.

The IWC observes that the expansion of world cereals trade could exceed 265 million tons, if economic growth is more rapid than assumed, but could also be inhibited by other factors, particularly the difficulties that developing countries may encounter in financing their imports.

The indebtedness of the developing countries is a problem whose ramifications go well beyond the field of trade in cereals. The granting of credit facilities by the cereals exporting countries would constitute at best a partial and temporary solution. Any significant

increase in the price of cereals would result in a further burden on the balance of payments of many developing countries. In real terms, export prices are now at their lowest level since the 1930s. Some exporting countries have taken steps to reduce their production, which could result quite soon in a shortage of supply. The cereals economy would thus commence another phase in its cycle, going from surplus to shortage and back again.

In 1984 the IWC held a symposium in Ottawa on the prospects for the world cereals trade at which Professor D. Gale Johnson of the University of Chicago expressed himself pessimistic on the prospect for the long-term development of world trade in cereals "but not so pessimistic as the USDA or the IWC Secretariat." According to Professor Johnson, the increase in world trade in cereals to the year 2000 is not likely to be more than half of that recorded in the 1970s. The price of cereals on the international market would continue to decline in real terms, as supply would continue to increase more rapidly than demand.

Conclusion

It is evident from this rapid survey of different projections that forecasts of the development of world trade differ according to the hypotheses used for population and incomes. For example, estimates of the cereals import needs of developing countries by the year 2000 vary from 30 million tons (Variant 2 of the Global 2000 report) to 144 million tons (IWC), while another set of forecasts (FAO) puts them between 81 and 132 million tons according to different scenarios. For the centrally planned economies, estimates vary from 10 million tons (Variant 2 of the **Global 2000** report) to 52 million tons (IWC).

Despite these wide differences, the forecasts show, in general, that the rate of increase in agricultural trade up to the year 2000 is likely to slow down, because of the slackening demand in the developed countries; at the same time the variability in the food imports of the centrally planned economies is likely to continue, with destabilizing consequences for the agriculture-exporting countries.

Commentary on 'Enhancing Competitiveness: International Economic Policies'

D. Gale Johnson

Given the time limits imposed on me, I do not have time to treat Mr. Avery's paper as politely as one should treat a guest. So I apologize to Mr. Avery at the start for some comments and criticisms that may appear a little sharp in order to make a point in a brief amount of time.

Mr. Avery has some rather harsh things to say about export subsidies, especially when used by the United States. Referring to U.S. export subsidies he asks these rhetorical questions:

"Who benefits therefore from this kind of measure? And who pays?"

But what about European Community export subsidies, which have involved the following amounts in European Units of Account (EUAs):

1979	6.44 billion
1980	7.60 billion
1981	5.50 billion
,1982	4.70 billion
1983	5.10 billion
1984	5.30 billion

Yet the EC is concerned about a curiously administered \$2 billion fund to be expended over a three-year period. This fund is now tied up with a cargo preference ruling issued by a federal judge. Has the EC ever considered that its use of export subsidies could go unchallenged forever?

Mr. Avery discusses U.S. dairy policy and U.S. export subsidies, claiming that the United States captured a large share of the export market for one dairy product—dry skim milk and that for one year, **1982**. Let us look at what has happened to world dairy exports since the beginning of the **1970s**.

Essentially all dairy products exported from the EC have been subsidized for the past 15 years. It is thus interesting to compare what changes have taken place in world dairy trade since 1969–70. The net exports of four leading dairy producers were as follows for the years indicated (whole milk equivalent in tons):

	<u>1969–70</u>	<u>1982</u>
European Community	Zero net exports	17.0 million
Australia	3.1 million	1.3 million
New Zealand	6.2 million	6.3 million
United States	1.0 million	1.8 million

One might ask, as does Mr. Avery, why the world market suffers from gross oversupply of dairy products? The data seem quite clear on this point. Only one of the four major dairy producers substantially increased dairy exports. One low-cost producer—Australia—actually decreased exports and the world's lowest cost producer of dairy products—New Zealand—was able only to hold its absolute level of exports constant but lost market share in world dairy trade.

I found much of his discussion of the position that EC will take into GATT negotiations either very vague or very disturbing. These positions are enunciated:

- EC will maintain its position for import and export of agricultural products. Does this mean the status quo is to be maintained with the EC as an exporter of grain and the world's largest exporter of dairy products, beef, and sugar?
- EC will retain a system of variable import duties and export refunds (subsidies) to stabilize its internal markets. He says this does not preclude improvements in the system. But what improvements would be considered? Basing threshold prices on some relation to world market prices of past three years? Or a stated reduction in target prices—say 2 percent per year—until some relationship to world prices is reached? It is not clear what improvements are envisaged.

I find quite disturbing the comment that the EC will retain variable levies and subsidies because they "paid with concessions in earlier negotiations for the right to apply these mechanisms." What was paid? Actually what was paid was the binding of tariff duties on what were then considered to be insignificant feed products. But the EC has be-

come increasingly unwilling to live up to these commitments. It has already 'weaseled' its way out of its binding on manioc flour by negotiating agreements with weaker trading partners to limit their export to the EC. It has tried to tax vegetable oils, though not butter, which the EC produces in large quantities.

The EC has heavily subsidized farm products that compete with soybeans and other similar products. As Mr. Avery notes, such subsidies, called production aids or deficiency payments—for olive oil, oilseeds, butter, skimmed milk powder for animal feed, and certain processed fruits and vegetables—have been paid for several years. Is it possible by those means largely to negate the 'price EC paid for its variable levies and subsidies?' "Is it intended to continue with these policies in the EC? Mr. Avery is not clear. Such policies will almost certainly further reduce EC imports of agricultural products.

And, in any case, even if the EC paid a lot, is this a good argument for continuing a policy of variable levies and export subsidies that may be counterproductive?

The main hope for the future concerning EC policies is the statement: 'In the longer term, the support prices fixed by EC could be fixed at levels closer to those of other exporting countries.' However, you should not let your enthusiasm run wild—note the qualification, 'this would be logical especially for those producers where the world market accounts for a significant part of EC production.' Does this mean that maize or corn would be excluded since EC is not now an exporter? Or that oilseed support would continue to increase because the EC is a large importer of oilseed and vegetable meals and oils? It is not clear exactly what is intended.

But this is enough about particular policy measures in the EC. I will close by commenting about the very serious problem the EC and U.S. agricultural policies have created. Neither Mr. Avery nor Mr. Amstutz gave adequate consideration to some of the long-run problems our agricultures face.

We have created a substantial excess productive capacity in agriculture that will haunt us for most of the rest of this century. Even if appropriate policies started tomorrow, it would take the EC and the United States nearly a decade to eliminate this excess capacity and return to a situation in which market prices would provide adequate incentives for a renewal of slow output growth.

If we continue with the kind of policies that seem implied by EC discussions and the farm legislation now under discussion in Washing-

ton, we will be haunted by large expenditures, competitive export subsidies, and increasing tensions between us. What needs to be recognized in both the EC and the United States is that our policies have been responsible for depressing world market prices for most farm products. The declines range from 15 to 25 percent for wheat, 10 to 15 percent for coarse grains, by as much as 50 percent for dairy products, a quarter for beef and, currently, by 70 to 75 percent for sugar. While the available empirical estimates attribute greater responsibility to the EC than to the United States for this state of affairs, U.S. responsibility is probably greater than these studies indicate. No study has adequately modeled the effects of our target prices on grain and cotton production and it has not been possible to reflect adequately the impact of our current sugar policy on world demand for beet and cane sugar.

Two final points. First, we may not have seen the end of the decline in rate of growth in international trade. All of the projections I am familiar with project Chinese grain imports at or above the levels of the early 1980s. However, the Chinese economic reforms are working. China is unlikely to be a net importer of grain by the end of this decade. But even with Chinese grain imports continuing at recent levels and East European grain imports at the 1980 level, the projections of world exports of agricultural products are projected to grow from 1980 to 2000 at only half the growth rate of the 1970s. But East European grain imports are now only half what they were only five years ago. And it is unreasonable to expect further large increases in agricultural imports by the USSR.

Second, one can only hope and pray that the EC and the United States, along with Canada and Australia, can recognize the seriousness of the situation that they and their farmers face for the rest of this century. This will require the EC to take a much less defensive attitude toward the CAP, to recognize emotionally and intellectually the impact that the CAP has had on the level and stability of international market prices, and to be willing to seek alternative ways of meeting the income needs of the less developed areas of the EC.

The United States must face up to its failures to follow a liberal trade policy in agriculture and a market-oriented policy domestically. We have to give up the 1955 GATT waiver. We should abolish our quantitative import restrictions for beef, sugar, long staple cotton, and dairy products. We need to recognize that our deficiency payments are first of all a subsidy and indirectly are an export subsidy. Except for our

efforts to do something about our dairy output—though at best I think our intention is only to reach self-sufficiency—we have done not one thing since 1981 or since 1977 to make our domestic farm policies consistent with a liberal trade policy.

I agree that some of the decline in U.S. exports of agricultural products since 1981 has been due to the overvalued dollar, our high price supports, EC export subsidies, and the response of some of our competitors to U.S. output restraints, such as those that existed in 1982. But to expect that a declining value of the dollar and a sharp reduction in our price supports will result in our quickly regaining the 1981 value of agricultural exports is being wildly optimistic. I hope I have made it clear that the situation U.S. and EC agriculture now face cannot be corrected by merely tinkering with a few policy measures or currency realignment. We can produce more agricultural products than can find markets at prices that will provide a reasonable return for the resources now engaged in agriculture. Just as we did in the late 1950s and through most of the 1960s, the United States faces a long period of difficult adjustments in agriculture. It is necessary to reduce the resources engaged in agriculture. This means the reduction of labor and capital since most of the land will remain in agricultural use.

The adjustments that would be required of U.S. agriculture would be significantly less painful if similar adjustments were underway at the same time in the EC as well as in Japan. Hopefully, the forthcoming round of GATT negotiations will make some progress on this score. Unfortunately, I am dubious about the willingness of either the EC or the United States to face up to the realities of world agriculture and the need to adjust their farm policies. Thus, I am quite pessimistic about the prospects for any real change before the end of this decade.

Enhancing Competitiveness: National Economic Policies

Manuel H. Johnson

This paper discusses the broad outlines of U.S. domestic economic policy in recent years, the resulting effects on economic performance here and abroad, and the implications for American agriculture. The paper does not attempt to deal with the specific problems of American agriculture in any detail. Other contributions to this symposium are designed to meet that need.

It will probably come as no surprise that we in the Reagan administration feel that the contribution of our economic policies has been positive. But we also recognize that economic problems remain and are intense for some parts of the agricultural community. A disinflationary process is still occurring in many primary commodity markets, including those for agricultural products, and agricultural land values are being marked down from previously inflated levels.

The situation is further complicated by its international dimension. The situation of American agriculture cannot safely be viewed from a purely domestic perspective. American agriculture has become an important factor in world markets and derives significant revenue from exports. It is clear that American agriculture must continue to be competitive internationally.

There is little possibility of separating or walling off domestic markets from international markets without suffering heavy losses. Steps have been taken recently in cooperation with the other Group of Five countries (France, Japan, the United Kingdom, and West Germany) to achieve a reduction in the exchange rate of the dollar and stronger growth abroad. This should gradually be beneficial in reducing some of the more intense international competitive pressures on U.S. domestic sectors, including agriculture.

It is easier to identify the cause of some of **agriculture's** problems than to formulate completely satisfactory short-run solutions. American agriculture is in the throes of a difficult adjustment. The very difficulty of the process and the personal hardships involved may account in part for the tendency of some in the agricultural community to look outward to national economic policy in the hope that some modification there can solve the problems of agriculture.

It is all too common to hear that the current problems of agriculture somehow result from the unbridled operation of market forces and could be solved by expanding the amount of governmental intrusion into the market process. The thrust of this paper is just the reverse. The Reagan administration believes that maximum reliance should be placed on a productive private sector that is responsive to market signals. This, in the long run, will bring real benefits to the entire economy, including agriculture. During the current difficult period of transition, targeted financial assistance will have to be available to the agricultural community. But the long-run solution for agriculture will be found in market processes, not in government programs.

The Reagan economic program: goals and accomplishments

The economy inherited by the Reagan administration in early 1981 was in disarray. Inflation was raging with consumer price increases reaching the 12 to 13 percent range in 1979 and 1980. The prime rate of interest hit a record 21.5 percent by the end of 1980 and financial markets were under heavy strain. Real interest rates had been negative for several years and heavily leveraged operations in business and agriculture had become commonplace.

Productivity growth had turned sluggish, averaging less than 1.5 percent per year from 1970 to 1980, only one-half of the pace in the previous decade. To combat soaring inflation and stagnating real growth the administration instituted a new policy approach, moving away from the modified Keynesianism that had governed **U.S.** economic policy throughout the period following World War II.

The Reagan economic program consisted of four parts.

- Federal spending restraint to return productive resources to the private sector.
- Marginal tax rate reduction and depreciation reform to restore incentives and promote growth by lowering labor and capital costs.
- **Regulatory relief** to lower production costs and encourage competition.

- Gradual restraint and stabilization of monetary growth to reduce inflation and to restore confidence to the financial markets.

A new policy emphasis on supply-related factors was embodied in the Economic Recovery Tax Act of 1981, which reduced marginal tax rates on both physical and human capital over a three-year period and thus raised the real after-tax rate of return on productivity activity.¹ In addition, it was expected that monetary policy would provide a gradual reduction in the rate of growth in the money supply (M1) consistent with the projected targets set by the Federal Reserve Board. This phased-in restraint on money growth was expected to offset any demand stimulus from the scheduled tax rate reductions leaving a decline in relative prices for work effort, saving, and investment that would encourage productivity growth.

Things did not work out quite that smoothly. The three-stage tax reduction did not become effective in any significant way during 1981. Meanwhile, there was an abrupt deceleration in monetary growth from a double-digit pace of 13 percent annual rate from January to April to a negative 4 percent annual rate from April to June. Over the whole year (fourth quarter 1980 to fourth quarter 1981) money grew at only a 5 percent rate. The result was the 1981–82 recession and a rather bumpy transition for the economy. While the temporary costs of recession were high (unemployment, lost output, and large budget deficits), inflation was cut very sharply and the stage was set for a strong economic expansion.

Vigorous economic expansion

The ensuing expansion has generally exceeded mainstream expectations. In 1982 and 1983, most economists predicted that large federal budget deficits and high real interest rates would prevent any strong or sustained expansion of the economy. Any recovery that did occur would be stunted and would have to be led by consumers. The actual pattern of developments has been quite different. The economy has expanded rapidly with capital investment rising much more strongly

¹ For studies that estimate the impact of marginal tax rate reductions since 1981, see Allen Sinai, Andrew Lin and Russell Robins, 'Taxes, Saving, and Investment: Some Empirical Evidence' *National Tax Journal*, September 1983, pp. 1-25; Mack Ott, 'Depreciation, Inflation and Investment Incentives: The Effects of the Tax Acts of 1981 and 1982,' *Economic Review*, Federal Reserve Bank of St. Louis, November 1984, pp. 17-30; Stephen A. Meyer, 'Tax Policy Effects on Investment: The 1981 and 1982 Tax Acts,' *Business Review*, November/December 1984, pp. 3-14; and James Gwartney, 'The Impact of the 1981-1984 Tax Cut,' Testimony before the Joint Economic Committee, April 23, 1985

than predicted while consumer behavior has been roughly in line with earlier cyclical patterns.

Many observers underestimated the positive effects of the 1981 tax reductions on the real rate of return to capital and overestimated the negative effects on investment of high financial market real rates of interest. As shown in Charts 1 and 2, there appears to be a much closer relationship in recent U.S. experience between the real after-tax return to capital and investment activity than there is between investment activity and the real rate of interest as measured in financial markets. This conforms with the supply-side perception that after-tax rates of return exert a strong influence on real economic activity.

Real growth was very strong in the first year and a half of the current expansion, averaging more than 7 percent at an annual rate. Last summer, the economy entered a softer phase with real growth slowing to about a 2.5 percent rate over the past year. To some extent, the slowdown was probably a normal response to a more mature stage of economic expansion—after the fastest increase for any comparable period since the Korean War—and the absence of further supply-side stimulus as the effects of the 1981 tax cuts began to fade. The growth slowdown also reflected tighter monetary conditions. Growth in M1 fell from about 10 percent during 1983 to less than 6 percent during 1984 with M1 virtually flat from June to October of 1984.

CHART 1
Real Interest Rate and the
Rate of Investment

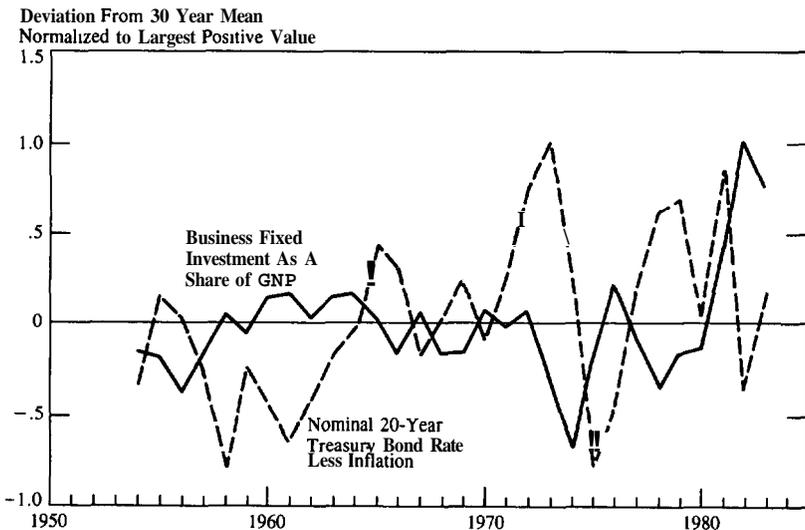
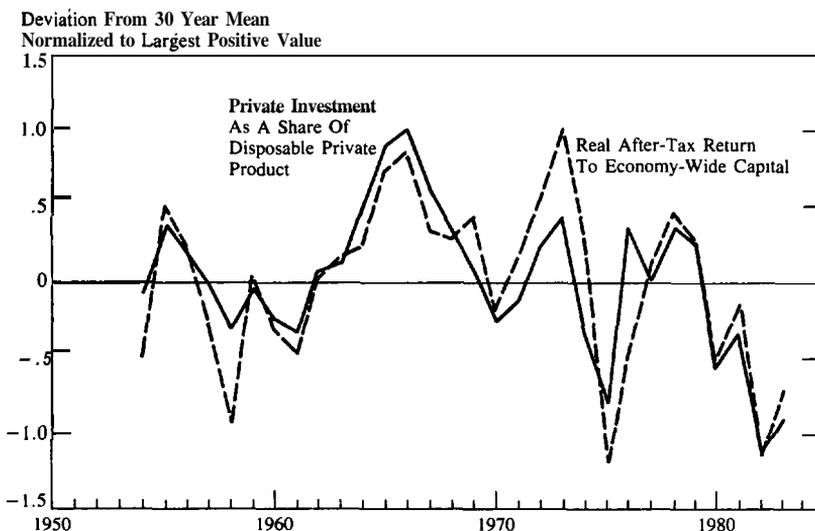


CHART 2

Real After-Tax Return to Capital and Investment's Share



The current situation and the near-term outlook

Monetary growth has resumed since late last year at a relatively rapid pace. The Federal Reserve **rebased** its monetary targets at the middle of this year but M1 is once again above target. Ordinarily, this might be a matter of growing concern on purely monetarist grounds but monetary velocity has not behaved in the expected fashion. Instead of growing near the 3 percent postwar trend rate, velocity has fallen sharply this year at about a 6 percent annual rate through the first three quarters of the year. A temporary decline in velocity, for a quarter or so, would not be unusual as monetary growth accelerated, but the persistence and size of the decline in velocity has puzzled most monetary observers. There are, however, no signs of recession, inflation is very well behaved, and there are now some fairly clear indications that the pace of real growth is beginning to pick up.

The index of leading indicators has risen for five successive months, April through September, and payroll employment has risen strongly since midyear, suggesting that the pace of activity is beginning to increase. The third quarter GNP result may not have seemed particularly strong with real GNP up at a 3.3 percent annual rate, following a 1.9 percent rate of advance in the second quarter. However, the rise in

GNP was held down by a decrease in inventory investment. Real final sales grew at about a 6 percent annual rate during the quarter. Inventory positions now appear to have been drawn down sufficiently so that the continuation of growth in demand would mean more rapid rates of advance in real GNP. Inevitably, there is uncertainty as to the near-term pace and direction of the economy—economic forecasting being what it is—but the prospects for stronger real growth seem to have improved.

Monetary policy has been more accommodative this year with M1 rising at more than a 12 percent annual rate during the first nine months of the year. Interest rates have shifted lower and by late October were below year-earlier levels by about 250 basis points on the short end and 150 basis points on the long end of the credit markets. With sensitive measures of inflation showing few signs of life, the Federal Reserve is under no pressure to alter its monetary stance.

The administration has recently published its Mid-Session Review of the Budget, including its updated economic forecast. Real GNP growth this year is estimated to be 3 percent, measured fourth quarter to fourth quarter. (This assumes growth at about a 5 percent annual rate in the second half, which may still be achieved but will require a very strong fourth quarter.) It is expected that real GNP will rise at a 4 percent pace in 1986 through 1988. Inflation is also expected to remain moderate, with annual consumer price increases in the 4 percent range through 1988. The unemployment rate should still be at about 7 percent by the end of this year but is expected to decline to just over 6 percent by the end of 1988.

The consensus private forecast for the economy is not quite as optimistic as that of the administration, although the differences are not great and are probably within the standard error of anyone's projections. A comparison of the administration and private short-term economic forecasts is shown in Table 1.

The pattern of growth

Real growth of nearly 5 percent in the first 11 quarters of the current expansion has been close to the 5 percent average for previous post-World War II cyclical expansions that lasted this long—excluding the 1949–50 expansion that merged with the Korean War buildup. There has been an even faster pace of growth in domestic demand. Real gross domestic purchases, which adds back U.S. outlays on imports and deducts foreign outlays on U.S. exports, have risen at a 6.3 percent an-

TABLE 1
Comparison of Administration and Private Forecasts

	1985			1986		4Q to 4Q		Year to Year	
	II	III	IV	I	II	1985	1986	1985	1986
Real GNP	<u>Percent change, annual rate</u>								
Data Resources, Inc. (10/85)	1.9	3.1	2.3	1.5	1.6	1.9	2.1	2.4	2.1
Chase Econometrics (9/25/85)	1.9	2.8	2.5	3.3	2.8	1.9	2.4	2.3	2.6
Wharton EFA (9/26/85)	1.9	3.1	3.4	2.4	3.0	1.2	3.5	2.4	3.1
Townsend-Greenspan (8/9/85)	1.7	2.2	4.4	4.6	3.9	2.2	2.1	2.4	3.3
Blue Chip Consensus (10/10/85)	1.9	3.1	3.5	3.3	3.0	2.2	2.9	2.5	3.1
CBO (7/23/85)	n.a.	n.a.	n.a.	n.a.	n.a.	2.6	3.4	2.6	3.6
Administration (7/22/85)	1.7	4.5	5.5	4.0	4.0	3.0	4.0	2.7	4.2
GNP Deflator									
Data Resources, Inc.	2.6	3.0	3.7	3.1	3.0	3.7	3.2	3.7	3.2
Chase Econometrics	2.6	3.2	3.1	4.0	3.3	3.6	3.9	3.6	3.5
Wharton EFA	2.6	2.9	3.7	4.0	3.7	3.6	4.0	3.6	3.7
Townsend-Greenspan	2.8	4.8	4.2	5.5	5.0	4.3	5.7	3.9	5.0
Blue Chip Consensus	2.6	3.1	3.6	3.9	4.0	3.8	4.2	3.7	3.8
CBO	n.a.	n.a.	n.a.	n.a.	n.a.	4.3	4.3	3.9	4.3
Administration	2.8	4.0	4.0	4.3	4.3	4.0	4.3	3.8	4.1
Civilian Unemployment Rate	<u>Percent (average for period or 4th quarter)</u>								
Data Resources, Inc.	7.3	7.2	7.3	7.3	7.4	7.3	7.6	7.3	7.5
Chase Econometrics	7.3	7.2	7.4	7.5	7.4	7.4	7.4	7.3	7.4
Wharton EFA	7.3	7.1	7.0	7.2	7.0	7.0	6.7	7.2	6.9
Townsend-Greenspan	7.3	7.3	7.2	7.1	7.0	7.2	7.6	7.3	7.2
Blue Chip Consensus	7.3	7.2	7.2	7.1	7.1	7.2	7.1	7.2	7.1
CBO	n.a.	n.a.	n.a.	n.a.	n.a.	7.1	6.9	7.2	7.0
Administration	7.3	7.2	7.1	7.0	7.0	7.1	6.9	7.2	6.9

nual rate in contrast to 5.0 percent in the comparable stage of four previous post-World War II expansions.

The pattern of growth in the first 11 quarters of the current and previous expansions is summarized in Table 2. As shown there, capital spending has been a much larger factor in this expansion than in previous expansions, accounting for a little less than one-third of real growth during this expansion or more than twice as much as during comparable periods in past expansions.² Growth in almost all other components of domestic demand has also been stronger this time, but the net export balance has been a large statistical negative reflecting

TABLE 2
GNP Components in the First Eleven Quarters
of the Current and Previous Expansions*

	Real Growth		Contribution to Total Real Growth	
	Average, four past expansions (Percent, annual rate)	Current expansion	Average, four past expansions (—percent of total—)	Current expansion
Real GNP, total	5.1	4.9	100.0	100.0
Consumer spending	4.7	5.0	57.0	67.4
Durables	10.3	12.2	15.9	26.2
Business capital spending	7.6	11.5	14.6	27.3
Structures	4.0	6.0	3.2	4.4
Equipment	9.8	13.9	11.4	22.9
Residential construction	10.7	16.8	8.4	10.5
Inventory investment	n.a.	n.a.	9.7	10.9
Net exports	n.a.	n.a.	2.8	-28.2
Exports	8.8	0.4	10.6	0.7
Imports	7.8	16.7	-7.8	-28.9
Federal purchases	-0.4	4.1	-1.1	7.1
Excluding CCC	n.a.	5.5	n.a.	9.0
State & local purchases	3.7	2.1	8.5	5.0

*Four post-Korean War expansions, excluding the 1958–60 expansion that lasted only eight quarters and the short-lived 1980–81 recovery. In all cases, expansion is measured from the quarter containing the NBER reference cycle trough.

²The strong cyclical expansion of investment has raised the ratio of gross investment to GNP to much more satisfactory levels. The situation is not quite so favorable in terms of net investment. On this point, and for a more critical view of the effect of recent policies, see Barry P. Bosworth, *Tax Incentives and Economic Growth*, The Brookings Institution, 1984, pp. 1-208.

the leakage of demand to overseas suppliers. (In turn, however, the net export balance has been the mirror image of a large voluntary inflow of capital to the U.S. which has supplemented domestic savings and stimulated capital formation.)

Inflation and interest rates

One of the more striking features of recent economic developments is the progress that has been made in reducing inflation. The record is summarized in Table 3. As shown there, in terms of the GNP deflator and the Consumer Price Index, inflation has been pulled down to the 4 percent range or less in recent years. Inflation has been virtually eliminated for producer (wholesale) prices. A disinflationary process, particularly pronounced at early stages of the production process, has been continuing even as real growth has resumed. For example, wholesale prices of crude materials have now declined for ten consecutive months and are more than 10 percent lower than a year earlier. While this has been extremely beneficial in terms of reducing the overall rate of inflation, it has meant economic difficulty for producers of primary products—including large segments of U.S. agriculture.

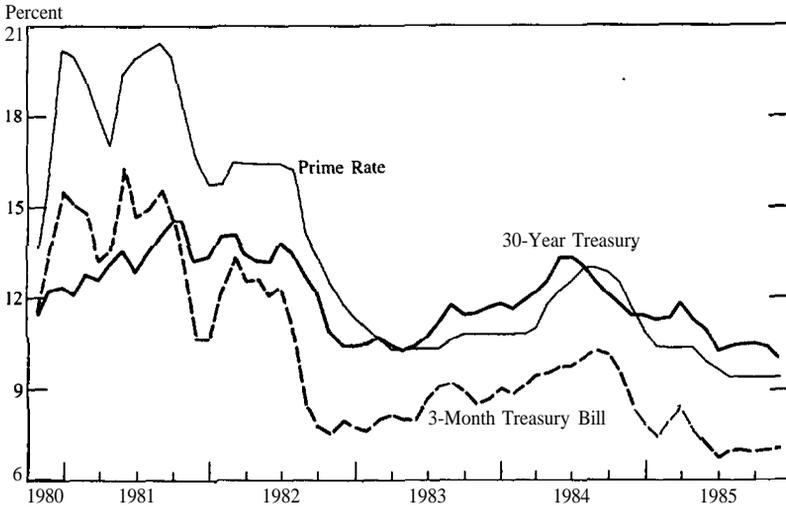
TABLE 3
Recent Progress Against Inflation
(percent change, annual rate, for period indicated)

	1980	1981	1982	1983	1984	1985 to date
GNP: Implicit Price Deflator	10.2	8.9	4.3	3.8	3.6	3.8
Consumer Price Index	12.4	8.9	3.9	3.8	4.0	3.2
Producer Price Index (wholesale prices)	11.8	7.1	3.7	0.6	1.7	-0.1

Note: CPI and PPI through September

There have been sizable declines in nominal interest rates during recent years. Chart 3 shows the record since 1980 for some key interest rates. The prime rate of interest has fallen from its 21.5 percent peak in late 1980 to 9.5 percent at the time of this symposium. The 3-month Treasury bill is currently trading near 7.25 percent, down from a cyclical peak of more than 16 percent at mid-1981 and the 30-year Treasury bond now yields about 10.5 percent in contrast to more than 15 percent at its peak in late 1981.

CHART 3
Key Interest Rates
(Monthly Averages)



Real interest rates have fallen less but seem high mainly in relation to artificially low rates during much of the postwar period because of the pursuit of Keynesian demand management policies. These policies led to serious inflation and negative real rates of interest by the late 1970s. Real interest rates in the U.S. throughout the 19th and early 20th centuries averaged in the 4 to 5 percent range, except for the clear abnormalities of war and depression.³ That is not far from the present level and tax rates are currently much higher than in the earlier period. It is very questionable, therefore, whether U.S. real after-tax rates of interest are much higher than any realistic historical standard.

The point of this brief review of recent economic performance has not been to suggest that the economy is without problems. But the evidence suggests that Reagan economic policies have been remarkably

³An interesting historical review has been provided by Stephen C. Leuthold, 'Interest Rates, Inflation and Deflation: *Financial Analyst Journal*, January-February 1981, pp. 28-41. For a thorough discussion of the measurement of real interest rates, see Robert Mundell, 'Inflation and Real Interest: *Journal of Political Economy*, June 1963; James Tobin, 'Money and Economic Growth: *Econometrics*, October 1965; and Thomas Sargent, 'Rational Expectations, the Real Rate of Interest, and the National Rate of Unemployment: *Brookings Paper on Economic Activity*, 2, 1973.

successful. The recent economic record certainly stands in marked contrast to that of the U.S. economy in the late 1970s and growth has been more vigorous here than in most other major industrial nations.

We are now benefiting from strong growth, low inflation, and rising levels of employment. Hence, we do not see that any drastic alteration in the economic policy setting is required. Quite the contrary, we feel that we need to continue further along present lines by increasing the incentives for private sector activity through a more favorable tax system, reducing the rate of growth of federal spending, and enlarging the scope for the operation of free markets. This can only be accomplished if the rate of inflation is kept securely under control. Reversion to high rates of inflation would eventually undercut the progress that has been made since the late 1970s.

Deficits, interest rates, and the dollar

Reagan economic policies **have** frequently been misinterpreted by viewing them in Keynesian terms. Large budget deficits after 1982 have been viewed as consumption-driven fiscal stimulus that would expand aggregate demand and push up interest rates and crowd out private investment. The actual pattern of results has been very different. Interest rates came down sharply after mid-1982, even while the budget deficit was widening. **Inflation** has fallen very sharply and remained low. Furthermore, the vigorous expansion of the economy has not been driven by the consumer but has featured a very strong expansion of investment in plant and equipment. Clearly, something has been happening that traditional demand-oriented theories cannot explain.

Since 1982, economic growth in the United States has run far above the projections that have been generated from standard macroeconomic models and inflation has been much lower than projected. Efforts to interpret U.S. experience in simple demand-management terms have led many economists to erroneous conclusions and inaccurate projections. The U.S. economic policy approach has not been purely demand-oriented, rather it has emphasized supply-related incentives to increase real output and monetary policy to reduce and contain the rate of inflation.

The demand-oriented view has concentrated on the size of the budget deficit and has alleged that the U.S. policy mix is wrong, with fiscal policy too loose and monetary policy too tight. This, in turn, has required a tortuous and obviously unsatisfactory line of explanation as

to why the U.S. dollar appreciated steadily in the foreign exchange markets from late 1980 to late 1984. Large U.S. budget deficits were viewed as a potent force driving up real interest rates that pulled in foreign capital and strengthened the dollar in the process. The same line of reasoning has been used by many observers in the European countries who tend to use the size of the U.S. budget deficit as a proxy for all that they feel is wrong with the international economy.

The labored nature of such lines of reasoning is all too apparent. For example, a country that ran a large budget deficit because of excessive fiscal stimulus would find domestic demand spilling abroad and its currency depreciating—the exact opposite of what has happened in the U.S. situation. It is unrealistic to argue that there was a head-on collision in the capital markets between public and private demands for credit. The share of federal borrowing in total funds raised in U.S. credit markets has declined from 39.9 percent in 1982 to 35.5 percent in 1983, 27.1 percent in 1984, and an estimated 25.7 percent in the first half of 1985 and interest rates have come down substantially.

The fact of the matter is that the simple budget deficit theory is defective and the alleged systematic linkages to interest rates and international capital flows are weak to nonexistent. In March 1984, the Treasury Department released a comprehensive study dealing with the various economic issues associated with the federal budget deficit.⁴ Probably the most important single conclusion to be drawn from that study is that there are no simple answers about the effects of federal deficits. For example, the notion that higher deficits cause interest rates to rise and the dollar exchange rate to appreciate is not at all certain. The direction in which interest rates and exchange rates move as deficits increase depends on a complex set of factors of which the following are only a few possible examples.

- The state of the business cycle here and abroad.

⁴*The Effect of Deficits on Prices of Financial Assets: Theory and Evidence*, U.S. Treasury Department, Washington, D. C.: U.S. Government Printing Office, March 1984, pp. 1-83. See also, Manuel H. Johnson, Testimony before the Joint Economic Committee, October 21, 1983, and before a Subcommittee of the Joint Economic Committee, September 13, 1984. James Girola, 'The Effects of Federal Deficits on Interest Rates': presented at the American Economic Association Meetings, Dallas, December 1984; and James Girola and Manuel Johnson, 'Do Deficits Raise Interest Rates?: A Structural Analysis of Financial Markets': presented at the Western Economic Association Meetings, Anaheim, California, July 2, 1985. For an interesting historical review, see Paul Evans, 'Do Large Deficits Produce High Interest Rates?', March 1985, *American Economic Review*, Vol. 75, No. 1, pp. 69-87.

- Whether the deficits are occasioned by tax reductions or government spending increases.
- The prevailing pattern of money supply growth and rates of inflation here and abroad.
- The prospective real rates of return in national markets discounted for any anticipated degree of political or economic instability.

Even when all these and similar factors are accounted for, it is still not possible to establish statistically a dependable systematic relationship between federal budget deficits and interest rates. One reason for this is that over the course of the business cycle there is a fairly straightforward empirical relationship between budget deficits and interest rates, but it runs in precisely the opposite direction from that which the conventional wisdom would require. Budget deficits rise in economic recession when interest rates are relatively low and budget deficits narrow in economic recovery when interest rates are relatively high. Therefore, over the business cycle, the largest deficits are associated with low interest rates and smaller deficits have typically been associated with higher interest rates. Even after correction for such cyclical effects, the deficit-interest rate relationship is weak and uncertain at best. This basic empirical finding, which has been duplicated again and again by disinterested academic investigators, stands in marked contrast to the assertions of some financial commentators. The persistence of strongly held opinion in the face of contrary evidence is not unusual in the field of economics but it is certainly very pronounced in this particular case.

One can only conclude that the deficit-interest rate relationship is a derivative and shifting one. As such, it is not particularly useful in terms of explaining current economic performance or predicting probable future developments. The shortcomings of the deficit-oriented view of interest rates and economic performance have been clearly demonstrated in recent years.

The more obvious link has been between economic policies that have improved the investment climate and higher after-tax real rates of return on capital spending for plant, equipment, and structures in the United States. Tax reduction combined with greater freedom of markets in this country, open money and capital markets, and an effective control of inflation has made the United States a uniquely attractive investment outlet, especially when considering anemic growth in Eu-

rope in the last few years and the higher risks associated with **third-world** investment.

The link between U.S. financial market interest rates and capital inflows is taken for granted in many discussions but does not survive even elementary empirical testing. Interest differentials in favor of the dollar were actually wider in 1980 when the inflow of funds and the appreciation of the dollar began than they have been recently. Undoubtedly, interest rate differentials can sometimes play a dominant role in **day-to-day** exchange rate movements, and they are always one element in the picture, but they cannot explain the continuing net capital inflows to the U.S. or the lasting strength of the dollar.

In recent years the U.S. capital account of the balance of payments has been the driving force as investors have been attracted by high real after-tax rates of return in the U.S. economy. This is an entirely different process from a demand-oriented expansion that spills over onto imports and must be financed. The budget deficit, on which some economists place so much emphasis, has more likely played a negative role in attracting capital to the United States. Foreigners invest here despite our budget deficits, not because of them.

The U.S. current account deficit is definitionally equal in amount but opposite in sign to the position on capital account. Causation has run from the capital account to the current account since only that would be consistent with a strong dollar. The current account and trade deficits, in turn, result from the joint influence of a number of factors: a higher rate of growth and resulting demand for imports here than abroad, reduced U.S. exports to LDC countries burdened with heavy debt, and foreign protectionist measures, as well as the strength of the dollar.

Implications for agriculture

The nature of these economic developments in **recent** years has important implications for national economic policy and for agriculture as well.

Federal expenditure growth needs to be cut back. That is the way to reduce the budget deficit. Tax cuts helped shape this investment-led economic expansion and raising taxes could end it. The budget deficit problem is, in fact, a government expenditure problem. Federal outlays, as a percent of GNP, in recent years have surged up to the 24 to 25 percent range, far above previous peacetime levels. On the other hand, tax receipts are about 19 percent of GNP, tracking very closely with

previous experience. The tax base remains intact. The problem is on the outlay side of the budget and that is where the solution should be sought.

The current problems of U.S. agriculture have arisen primarily because of the transition from high rates of inflation in the 1970s to low rates of inflation in the 1980s. This large adjustment has implications for monetary policy. It is, of course, crucially important to avoid a return to an inflationary environment. It must also be recognized, however, that a monetary policy that is too restrictive for too long can put unnecessary upward pressure on the dollar, pull in too much foreign capital, and unleash protectionist forces.

The recent G-5 actions represent a cooperative international effort to cope with some of the pressures induced by a very strong dollar. The best way for other currencies to strengthen against the dollar is for foreign countries to improve the performance of their economies, remove or reduce existing structural rigidities, and raise the rate of return on their capital when it is employed at home. In their recent announcement, finance ministers and central bank governors of the Group of Five industrial countries (United States, France, Germany, Japan, United Kingdom) pointed out that such a process is indeed occurring—that significant progress has been made in narrowing disparities in growth and inflation, and in restoring national vitality and responsiveness. The Group of Five expressed the view that these recent shifts in the fundamentals of economic performance and prospects have not been reflected fully in exchange markets and that a further appreciation of the main non-dollar currencies against the dollar was desirable. Since the announcement, the dollar has experienced further significant declines.

Conclusion

In the last analysis, most of the problems of agriculture appear to be largely transitional and were brought on by the puncturing of the highly inflationary expectations of the late 1970s. It is important that the disinflationary process not be pressed too far or accelerated. That is one of the important current responsibilities of monetary policy. Nevertheless, agriculture and other sectors will have to adjust to the period of relative price stability that lies ahead, an adjustment process that will likely last for a number of years. The administration is committed to helping that adjustment process.

The strength of the dollar in foreign exchange markets is largely a

reflection of the strength of the economy and its improved prospects. It is not realistic to assume that the national or agricultural situations would be improved by reversing the policies of recent years. Weakening the dollar by damaging U.S. economic performance means weakening the overall economy. On the other hand, an appreciation of other currencies relative to the dollar, in response to improved performance and prospects abroad, would be desirable. As this occurs, U.S. competitiveness will improve and agriculture as well as other sectors will benefit.

The wrong directions are also clearly apparent. Artificially low interest rates, larger budget deficits, higher taxes, preferential credit, and renewed inflation are not in the long-term interest of the country or the U.S. agricultural sector. Yet, these are the probable results of shrinking away from the necessary adjustment process and trying to meet the deep-seated problems of agriculture through expanded government programs. Agriculture would prosper much more through a greater degree of market orientation in a steadily expanding U.S. economy and open, growing international markets.

Commentary on "Enhancing Competitiveness: National Economic Policies"

Robert Z. Lawrence

Beauty, it is said, lies in the eyes of the beholder and the account of the Reagan administration economic policies provided by Dr. Johnson confirms this adage. Viewing through the prism of Rosy-Scenario colored spectacles, Dr. Johnson pronounces Reaganomics a success. The American economy is finally on the right track. The modified **Keynesianism** governing U.S. economic policy in the postwar period has been abandoned. Inflation has been controlled, investment has been stimulated, and individual initiative unleashed by tax rate reductions. Developments such as the high real interest rates, the strong dollar, the large trade deficits, and the large net capital inflows into the United States should not be seen as problems for the aggregate economy, but rather as indicative of the policy's success and likely to be with us for some time. Thus, the long-run solution to the problems that a strong dollar, high real interest rates, and low real commodity prices pose for American agriculture lies not in expanding government programs to offset these developments, but in adjusting to them through market processes.

Dr. Johnson sees no reason for drastic alterations in economic policy settings. The economy is on a track that will produce growth rates between 3 and 4 percent in the foreseeable future. He concedes that the program did not work as smoothly as originally planned, because the delays in phasing in the tax cuts and the excessive restraint by the Federal Reserve induced a recession. But he argues that the ensuing expansion provides evidence of the policy's success.

The unusually strong role played by investment in the recent expansion is the key to Dr. Johnson's analysis. Higher after-tax rates of return on investment and increased confidence in the U.S. economy have en-

couraged Americans and foreigners to engage in an unusually large amount of capital formation. The shift in the U.S. position from international creditor to international debtor does not concern Dr. Johnson since the borrowing is being used to build the capital stock necessary to service the debt in the future.

My own interpretation differs from that of Dr. Johnson in several respects. In Kansas City, of all places, we know it is dangerous to predict the World Series at the end of the fourth game—to do so would be a Cardinal error. Similarly, I see the outcome of current policies as a lot less rosy and a lot more blue.

I do agree that, in its first few years, the Reagan program achieved some important gains. Given the Federal Reserve's decision to fight inflation with tight monetary policy, it was appropriate to provide a fiscal stimulus to bring the economy out of the 1982 recession. Failing to raise revenues and to reduce spending to bring the budget into balance as the economy moved back to full employment, however, was a mistake. The buy-now, pay-later fiscal policies adopted at the behest of this administration should not be judged purely on their recent impacts. The current stance of macroeconomic policy is dangerously unbalanced, with agricultural and other price-sensitive traded goods sectors of the economy subjected to unwarranted pressures. If a stronger exchange rate resulted primarily from foreign capital inflows to fund real capital formation, these pressures might constitute a necessary part of the adjustment process. But the foreign capital inflows have been absorbed primarily by the government sector to finance tax cuts that have gone mainly into consumption and defense spending. Unless we intend to launch a war of conquest, neither consumption nor defense will aid us in the future in servicing or repaying our debts.

Dr. Johnson and I disagree over whether this economy has experienced an investment boom or a savings bust. A deficit in the trade balance in goods and services indicates that the nation's spending exceeds its income; that is, it is borrowing. A change in national borrowing, in turn, reflects changes in net private borrowing and/or net government borrowing. Dr. Johnson argues that the dominant reason why this nation's spending exceeds its income lies in the strength of investment. He, therefore, puts most of the explanation for the current account deficit on net private borrowing.

In fact, the data do not support this interpretation. Between 1980 and 1984, net lending by the U.S. private sector changed very little as a share of GNI? In 1980, gross private savings (16.5 percent of GNP)

exceeded gross private investment (15.3 percent of GNP) by 1.2 percent of GNP? In 1984, gross private savings (18.4 percent of GNP) exceeded gross private investment (17.4 percent of GNP) by 1.0 percent of GNP. Thus, virtually none of the additional national borrowing was required net by the private sector. Indeed, before the advent of supply-side economics during the Carter administration, the United States invested similar shares of gross investment in GNP without borrowing from abroad. On the other hand, U.S. government increased its deficit by 2.19 percent of GNP, an amount fully reflected in the growth of the overall trade deficit as a share of GNP?

How strong has private investment been in the current recovery? Has it been of the appropriate magnitude and type to enable the nation to service its growing international obligations? Sorting out the evidence is a complex task. As a share of nominal GNP, the peak of 17.4 percent in 1984 for the Reagan years resembles that of the Carter peak of 17.9 percent in 1978 (and 17.5 percent in 1979). Between 1977 and 1980, the years under Carter, investment averaged 16.9 percent of GNP? This compares favorably with the 15.4 percent share constituted by investment between 1981 and 1984.

Measured in real terms, however, the recent investment does appear unusually strong. As a result of declines in construction costs (because of weak wage growth in that sector) and in equipment prices (because of the strong dollar and technological innovation) investors obtained about 1 percent more gross investment relative to real GNP than they did in 1979. But once depreciation is **accounted for**, even the real net national investment figures remain lower than in the Carter years. As a share of real net national product, real net investment in this recovery (1983:Q1-1985:Q2) of 6.2 percent remains below the 6.7 percent share recorded in the 1970s. Moreover, very little new investment has taken the form of increased purchases **of the** specialized machinery required to maintain the industrial base. According to my colleague Barry Bosworth, about 93 percent of the growth in equipment spending since 1979 occurred in either trucks or office equipment.¹ Thus, instead of increased capital formation in America's farms, mines, and factories, the investment is flowing into its offices—scarcely the appropriate preparation for servicing our international debt. Although Americans may be buying more than usual for their investment dollar, little evidence

¹ Barry P. Bosworth, Taxes and the Investment Recovery: *Brookings Papers on Economic Activity*, 1:1985.

exists to confirm that they are allocating an unusually large share of their incomes to prepare for the future tax and interest payment.

To the degree that he sees a problem, Dr. Johnson points only to excessive government spending. He claims that government spending financed through borrowing has the same economic impact as government spending financed by taxes. Since bonds are financed by future taxes, all spending requires tax increases. I doubt this equivalence theorem is valid in practice. If it were, we should have seen an increase in private U.S. savings commensurate with the increase in the U.S. government budget deficit as private Americans make provisions for their future tax payments. They have not as yet made such provisions.

Over the long run, therefore, I believe that this nation will not have invested or saved enough to service its growing indebtedness. Americans in the future will have to tighten their belts, both by paying more taxes and by paying higher prices for imports. Assuming that foreigners remain confident enough to sustain their capital inflows, the interest payments eventually are going to accumulate. These interest rate outflows will in turn weaken the dollar, and by making U.S. imports more expensive, they will reduce our living standards. When our future living standards decline, the legacy of Reaganomics will look quite different. On the other hand, the U.S. agricultural and manufacturing sectors will have to provide the goods necessary to service and repay our current loans to foreigners. For that reason, I believe the medium-term prospects for the traded goods sector are much brighter than Dr. Johnson suggests. The real exchange rate will have to fall even further than it has increased to attract resources back into farming and manufacturing, not only to restore the trade balance to its original position, but also to service the decline in our international indebtedness.

Let me suggest, in closing, that this nation would be far better served for the future if an installment program that included both revenue increases and expenditure cuts were immediately enacted while there remained strength in the economy. Such a program would bring immediate benefits to the traded goods sectors of the economy and, over the long run, remove the burdens that the current stance of policy will leave to the future.

The Challenge in Building Market Demand

Dale E. Hathaway

I want to concentrate on an issue that is virtually overlooked in our current discussions of our agricultural policy. We primarily hear that almost everything that is wrong is the result of our domestic **agricultural** programs, which need to be changed drastically, and that almost everything that is wrong is the result of unfair competition, which should be stopped. I believe that these two issues are not the major cause of our problems and that by concentrating on them we are almost certain to be frustrated and disappointed because we will find that attempts to solve the problem through either of these paths do not bring a satisfactory solution.

I want to concentrate on what I believe to be the central **problem**: the state of our markets. I want to step back from individual government programs. To the extent possible for one trained as an economist, I want to avoid the use of economic jargon and talk about markets and what we can do about them.

This approach makes certain assumptions that I think are reasonable. One is that we are competitive producers of a wide range of commodities at the farm level and that our internal capability of physically moving products from farm to export is second to none. A second assumption is that our ability to process raw products into more usable products—wheat to flour, feed to broilers, soybeans to meat and oil—is unsurpassed. Even so, I will concentrate much of my discussion on bulk commodities because that is where the "farm problem" is concentrated (Table 1). I say this because the decline in value of exports of wheat and products and **oilseeds** and products accounts for **\$8.1 billion** of the **\$8.5 billion** in export value from **1980** to **1985** and cotton for another \$1 billion. In terms of volume, **30.6 million tons** of the **33.8**

million ton decline in export volume are accounted for by grains, oilseeds, and oilseed products. In other words, 94 percent of the loss of value and 91 percent of the loss of volume are accounted for by the grain-oilseed complex. Indications are that this trend will continue in 1985-86.

TABLE 1
U.S. Agricultural Exports by Product Group,
Value, and Volume, Fiscal Years 1978-85

Product	Fiscal Year								Change 1980-85
	1978	1979	1980	1981	1982	1983	1984	1985	
	<u>Value in billion dollars</u>								
Grain and feed	11.7	13.6	18.7	21.9	17.6	15.2	17.4	14.3	-4.4
Oilseeds and products	7.5	8.7	10.0	9.4	9.7	8.8	8.8	6.3	-3.7
Cotton	1.7	1.9	3.0	2.2	2.2	1.7	2.4	2.0	-1.0
Tobacco	1.1	1.3	1.3	1.3	1.5	1.5	1.4	1.5	+0.2
Fruits, nuts, and vegetables	1.9	2.1	2.7	3.1	2.9	2.7	2.6	2.6	-0.1
Sugar and tropical products	0.6	0.7	0.9	1.4	0.8	0.7	0.8	0.8	-0.1
Livestock and products	2.4	3.2	3.1	3.1	3.2	3.0	3.5	3.3	+0.2
Dairy	0.2	0.1	0.2	0.3	0.4	0.4	0.4	0.4	+0.3
Poultry	0.3	0.4	0.6	0.8	0.6	0.5	0.4	0.4	-0.1
TOTAL	27.2	32.0	40.5	43.0	39.1	34.8	38.0	32.0	-8.5
	<u>Volume in million metric tons</u>								
Wheat and flour	32.8	32.2	36.9	43.5	45.3	38.0	42.7	31.4	-5.5
Feed grains	55.5	59.5	71.2	69.1	58.2	53.8	55.6	57.2	-14.0
Feed and fodders	---	4.3	5.6	5.8	6.0	6.9	6.8	6.5	+0.9
Rice	2.1	2.4	2.9	3.1	2.9	2.3	2.3	2.0	-0.9
Soybeans -	19.7	20.2	23.8	20.0	25.5	24.5	19.2	16.6	-7.2
Vegetable oils	1.5	1.5	1.8	1.7	2.5	2.4	1.0	0.8	-1.0
Oilcake and meal	5.8	6.2	7.6	6.5	6.5	6.7	5.1	4.7	-2.9
Cotton	1.4	1.4	2.0	1.3	1.6	1.2	1.5	1.3	-0.7
Tobacco	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	-0.1
Fresh fruit	1.3	2.8	3.1	3.4	3.1	3.0	3.2	2.7	-0.4
Animal fat	1.3	1.3	1.5	1.5	1.5	1.4	1.4	1.1	-0.4
TOTAL	121.7	137.5	163.8	162.6	157.9	144.8	143.6	129.0	-33.8

A review of the situation

The U.S. farm sector was internationalized in the 1970s as an increasing proportion of our farm output became dependent on export markets. The various components of the U.S. agricultural systems responded beautifully to growing demand for U.S. exports and our market share of a rapidly expanding world market for imports expanded rapidly as well. Our exports grew by leaps and bounds, measured both in volume and in value. Both the farm sector and the agribusinesses that sell to it and buy from it made investment decisions based on assumptions that the export market growth rate of the late 1960s and early 1970s would continue.

Suddenly all these assumptions went wrong. Starting in 1981–82, our exports began to fall in both volume and value. And the end of the fall is not yet in sight. But our farm output—apart from the decline induced by weather and Payment-in-Kind (PIK) of 1983—has not fallen. The result has been a major overcapacity problem in both the farm sector and in the agribusinesses serving it. The overcapacity in the farm sector has been manifested in falling farm prices and incomes, falling land prices, a farm financial crisis, and in sharply rising farm program costs. The agribusiness sector has seen huge financial losses, spectacular business failures, and substantial restructuring of all kinds of agribusinesses from local farm machinery dealers to farmer cooperatives.

This is all too familiar. As I indicated at the outset, our response has been to blame the problem on either our farm programs or our competitors. I shall attempt to prove that our problem is primarily markets and that, until and unless something improves in that regard, pursuing other issues will prove fruitless.

Some market concepts

Since terms are sometimes used loosely and this leads to misunderstanding, I think it is useful to define some terms that I believe will be useful. The concept of market is a concept that fits market economies with free consumers able to express their consumption preferences within the limits of their purchasing power. However, in the world of internationally traded goods, especially foodstuffs, this cannot be measured because there are so many interferences between foreign consumers and U.S. exporters, not the least of which are governments.

The best means I think we have to measure a market is utilization. The farmer in Illinois who raises corn and soybeans does not care

whether the world utilization of feed grains goes up because farmers in Japan feed and market more chickens or because the United States Agency for International Development (**USAID**) buys cornmeal and soy oil for foreign emergency food aid. Therefore, I will use utilization statistics as a market measure and avoid some of the problems of certain other measurements.

The link between utilization within a country and its imports is that imports are the difference between utilization and domestic production. Thus, in terms of our export interests, the export market is affected by both what happens to utilization and what happens to domestic production in importing countries.

Thus, the key variable to our export markets is world market growth. World trade in different goods grows as the market grows and our exports do especially well when world trade expands. Somehow we tend to believe that our exports are a direct function of foreign crop failures or competitor pricing, but they really are a function of trade growth.

There is also a matter of pricing involved in marketing. Again, we tend to think of affecting markets by varying prices to consumers, but in the case of international trade there is often a government or two between the U.S. exporter and the foreign consumer. Therefore, when we talk of pricing policy we need to be sure who the price changes affect. In all centrally planned economies, where exports are a function of the state import agencies, a cut in export price rarely gets passed on to the consumer. Since state trading is used in many market economies also, a high proportion of the world's consumers is isolated from world market prices, and from the individual country's internal farm prices.

There are several methods of cutting prices, and each has a different effect in terms of marketing strategy. One way of cutting prices is to cut prices to everyone. This is what changing price support levels or changes in exchange rates does. Another way of cutting prices is through the offering of below-market rates of credit to certain buyers but not to others or on certain models at certain times of year. A third type of price cutting is where different prices are charged to different buyers, as under the BICEP program. This causes resentment among the buyers that do not get the lowest prices. In an open pricing system like the U.S. system, it is clear to everyone who is getting a special price. Of course, the ultimate in price cutting is grant-type food aid, which is given on the basis of need of the recipient. In this case, the price is zero to the country but not necessarily zero to the ultimate consumer.

What has happened to our foreign markets?

Let us start with a global picture and work backward to major markets or types of markets in looking at the situation. In doing this, there are one or two important things to remember. One is that for most products there are some carryover stocks, held either by governments or by the private sector. Thus, utilization measures the state of market demand and is only constrained by supply in unusual situations. (It may be constrained by supply in the case of individual countries because of government intervention in trade.)

One of the surprising facts about world grain utilization is that it goes up almost every year. In fact, total world grain use has only fallen in three of the last 25 years—in 1963–64, in 1974–75, and in 1981–82. The 1963 decline was due to a large decline in the Soviet crop, which was not offset by imports, and the 1974–75 decline was due to a major decline in the U.S. output in the absence of ample stocks. As we shall see, the 1981–82 decline had a different cause.

Given the rarity of declines in use, what we are really looking at are rates of gain in use and the extent to which they are the result of trade. Let us examine four five-year periods beginning in 1965 (Table 2).

TABLE 2
Changes in Annual Wheat and Coarse
Grain Use by Five-Year Intervals, 1965–85

	<u>1965–70</u>	<u>1970–75</u>	<u>1975–80</u>	<u>1980–85</u>
World	147.4	72.4	186.4	113.1
United States	13.9	-9.1	14.7	30.9
World—United States	133.5	81.5	171.7	82.2
Centrally Planned	68.2	31.3	98.4	28.6
World—United States and Centrally Planned	65.3	50.2	73.2	50.0
European Community Total	9.5	4.3	2.1	-1.9
Japan	5.0	3.6	5.4	2.0
Competitor	7.0	1.5	5.4	4.8
All Other	43.8	40.8	60.3	48.7
OPEC	4.5	5.8	12.6	8.8
All Other	39.3	35.0	70.9	39.9

There are some surprising results in these figures. One is that until recently (the 1980–85 period), the United States had not contributed to increased world grain use. Since 1980, however, the increase in U.S.

grain use has accounted for over one-fourth of the increase in world use. A second surprise is that the Soviet Union and Eastern Europe have not contributed to increased world grain use since 1975. China increased grain use substantially from 1975–80 by increasing imports, and from 1980–85 use was further increased by expanded domestic output. The European Community has contributed little to grain use. Use has remained stagnant in the European Community since 1975.

In the 1965–70 period, the centrally planned economies accounted for about as much of the large increases in use as did all of the rest of the world outside the United States. From 1970 to 1975, the centrally planned economies accounted for three-fifths as much expansion as the rest of the world. In the 1975–80 period, the centrally planned economies were again a source of expanding use, accounting for half the total.

In terms of market growth, this has one very simple straightforward meaning. Since 1975 the market growth (outside of the United States) in the world market for grains has been increasing in the developing countries of the world.

In the period 1965–70, the centrally planned economies were one and one-half times as important in growth as the developing countries. The developing countries almost equaled the centrally planned economies in market growth in the 1970–75 period, and they have become the dominant factor in this decade.

Now let us look at the last five years, when things have gone badly for U.S. exports, to see if the market problem can be isolated. First, the market growth outside the United States, China, and the European Community is down markedly. Both the China market and the European Community market have been lost to internal production and, to make matters worse, both have now become significant competitors in the export markets for some products. The internal market growth of our traditional competitors (Canada, Australia, and Argentina) also is down, leaving exports to absorb more of their production growth. Therefore, what has happened is that high-growth developing countries become even more crucial to us and our export outlook.

Food and feed use

It is widely recognized that the world market for grain is two markets that interact—the market for grain for food and the market for grain for feed. Some grains are used almost completely in the feed market and some others, notably wheat, are used in both, depending on the

price ratios between wheat and feed grains. However, the relationship between market, incomes, and prices is different. The grain for food market is relatively insensitive to price—in other words, food consumption changes little over a wide range of prices. At certain per capita income levels, it is sensitive to income—the market expands as income grows. But above certain income levels the direct use of grain for food declines as income rises and a higher proportion of calories comes from poultry, dairy, and meat products.

The market for grains for feed is highly responsive to income because almost all poultry, dairy, and meat products require some grain to produce. Thus, the income-related response to consumption of these items is directly reflected in increased use of feed **grains**.

If we look at market growth (outside the United States and the centrally planned economies) in the context of food and feed we see some interesting patterns. In the rapid growth period of the late 1960s, food use grew more rapidly than feed use—and almost all of the growth in food use was in the developing countries but only one-third of the growth in feed use was there (Table 3). That pattern persisted during the 1970–75 period, except that the developing countries suddenly became the main source of growth in feed use while continuing their dominance in growth in food use.

TABLE 3
Changes in Annual Use of Grain For Feed
By Five-Year Intervals, 1965–85

	<u>1965–70</u>	<u>1970–75</u>	<u>1975–80</u>	<u>1980–85</u>
World	n.a.	n.a.	n.a.	n.a.
United States	12.1	- 15.4	7.9	20.4
World—United States	n.a.	n.a.	n.a.	n.a.
Centrally Planned	n.a.	n.a.	n.a.	n.a.
World—United States and Centrally Planned	27.3	23.1	39.7	24.2
European Community Total	8.7	0.6	0.9	1.9
Japan	4.4	2.6	4.3	1.0
Competitor	4.8	2.2	4.2	4.5
All Other	9.4	—	—	—
OPEC	0.4	1.5	5.8	8.5
All Other	9.0	16.2	24.8	8.1

Starting about 1975, the world grain market suddenly changed in a major way. For the first time in two decades the world markets for feed use of grain started to grow faster than the markets for food use of grains (Table 4). This was due largely to the surge in growth of feed use in the developing countries that, along with China, also accounted for almost all of the growth in the food use market.

TABLE 4
Changes in Annual Use of Grain for Food
By Five-Year Intervals, 1965-85

	<u>1965-70</u>	<u>1970-75</u>	<u>1975-80</u>	<u>1980-85</u>
World	n.a.	n.a.	n.a.	n.a.
United States	1.8	6.4	6.7	10.4
World—United States	n.a.	n.a.	n.a.	n.a.
Centrally Planned	n.a.	n.a.	n.a.	n.a.
World—United States and Centrally Planned	38.1	27.1	33.5	25.8
European Community Total	0.8	1.6	1.3	-1.1
Japan	0.6	1.0	1.1	1.0
Competitor	2.1	-0.7	1.2	0.3
All Other	34.6	---	---	---
OPEC	3.3	4.1	6.8	0.3
All Other	31.3	21.1	23.1	27.3

If we now turn to the period since 1980, we begin to see what has happened to our markets. The market growth has slowed appreciably and a major portion of the slower growth occurred in the feed market. The feed market in the European Community went from slow growth to negative growth. The growth in the Japanese markets fell to one-quarter the level of the previous five years and was the lowest in 25 years, and the growth rate in non-OPEC developing countries fell drastically to levels about the same as the late 1960s.

That, I think, is the overall market dilemma. Our market in the centrally planned economies essentially stopped growing in the late 1970s, except for China. China, however, has been amazingly successful in increasing domestic output and, thus, in filling their needs while reducing imports. Thus, the imports of the centrally planned economies now depend largely on the extent of the Russian crop shortfall.

The European Community has developed a policy that accomplishes what is hard to do. It has a policy that has brought its total grain

use to a negative growth rate, meaning that as internal production rises an increasing share of the production must find a market outside the European Community.

It is not surprising that the rate of growth of food use of grain is declining in Japan. It is somewhat more surprising to find the growth rate in feed use declining to the lowest level since the 1960s. Part of the answer, however, may be their increased imports of beef, which slowed the growth rates in their domestic beef and dairy industry.

But the biggest decline in market growth for food use is in OPEC, which had been a significant factor in the growth of world market for food grains. But most important of all is the sharp drop in the non-OPEC market growth of lesser developed countries (LDC's) for feed grains, which fell by more than one-half.

Can we get markets to grow again?

Let us examine the major markets of the world, one by one, and see what might be done to make them grow again. At this point, we will talk about U.S. government policy, about U.S. agricultural policy, and about private sector U.S. policy.

The centrally planned economies

In my view, the United States has overrated centrally planned economies as a growth market in recent years, especially the Soviet Union and Eastern Europe. Moreover, we vastly overrate our effect on their internal policies.

One of our mistakes was to believe that the Soviet Union and Eastern Europe made a fundamental policy change regarding dependence on outside imports in the late 1960s and early 1970s. In retrospect, what they actually did was to use imports to compensate for domestic crop shortfalls, not to increase total grain utilization and meat consumption substantially. In other words, they have not made use of imports to increase the rate of growth in consumption, as China did in the last half of the 1970s.

China did use imports to increase domestic consumption during the 1970s but now has replaced imports with domestic output. I would guess that as domestic use grows in China, as it will with higher consumer income, China will withdraw from the world feed grain export market and eventually return to imports to sustain domestic poultry and livestock expansion.

It appears there is little we can do that will cause the Russians, East

Europeans, or Chinese to change their basic strategies regarding imports. Price cutting will save the Soviets some foreign exchange, but it is unlikely to get them to buy more. The one exception to this is Poland, which might return to its 'import now and default later' policy of the late 1970s, if the West would provide the credits for grain imports. However, it is not clear that Poland would revert to a policy of domestic poultry and meat production based increasingly on imported grain.

Japan

Japan is a case where there is not much we can do to increase our market, but there are many things we can do to hurt it. We could lose our dominant market share of that grain market. We can lose that market if, as many now want, we impose heavy trade penalties on the Japanese economy to offset our immense trade deficit with them. This is not to say that we should not demand that Japan open its domestic markets to U.S. products. Of course, in the case of beef this cuts two ways, since if we sell more U.S. beef we will sell less U.S. feed grains and soybeans. (Since the United States is more efficient in providing beef, total world demand for grain will decline.)

Japan does not need either credit or lower prices to buy U.S. farm products. All that lower grain prices accomplish is that Japan's balance of payments is improved. Income growth and changes in habits have driven changes in Japanese food consumption and are likely to in the foreseeable future.

Developing countries

Developing countries have become the main source of growth in world use of grains now that growth has faltered. We must look at the reasons and what we might do about the situation.

The basic reason for the sharp decline in growth rates of grain use in developing country markets is the major slowdown in economic growth in most of those countries as a result of a series of external circumstances (Table 5).

The story of developing countries is somewhat akin to the story of U.S. agriculture over the last five years. It goes back to the mid and late 1970s. The problem started with the first oil shock of 1973. This created huge OPEC balance-of-payments surpluses and threw the foreign accounts of the oil-importing developing countries into huge deficits.

But since commercial banks had huge amounts of OPEC money to recycle, they were willing to make huge loans to developing countries,

TABLE 5
Population and GNP Per Capita, 1980, and Growth Rates, 1965-84

Country Group	1980 GNP (billions of dollars)	1980 Population (millions)	1980 GNP Per Capita (dollars)	Average Annual Growth of GNP Per Capita (percent)					
				1965-73	1973-80	1981	1982	1983*	1984+
Developing countries	2,059	3,119	660	4.1	3.3	0.8	-0.7	-0.1	2.1
Low-income countries	547	2,098	260	3.0	3.1	2.0	2.8	5.2	4.7
Asia	495	1,901	260	3.2	3.5	2.5	3.4	6.0	5.3
China	284	980	290	4.9	4.5	1.6	5.8	7.6	7.7
India	162	687	240	1.7	1.9	3.5	0.4	4.2	2.0
Africa	52	197	270	1.3	0.0	-1.7	-2.6	-2.6	-1.5
Middle-income oil importers	962	579	1,660	4.6	3.1	-0.8	-2.0	-1.6	1.1
East Asia and Pacific	212	162	1,310	5.6	5.7	3.7	1.9	4.5	3.4
Middle East and North Africa	25	31	830	3.5	4.3	-2.5	2.6	0.5	-1.3
Sub-Saharan Africa	26	33	780	2.0	0.5	4.1	-4.8	-5.4	-5.4
Southern Europe	214	91	2,350	5.4	2.9	0.2	0.3	-0.5	0.2
Latin America and Caribbean	409	234	1,750	4.5	2.9	-4.1	-4.8	-4.5	1.1
Middle-income oil exporters	550	442	1,240	4.6	3.1	1.5	-2.3	-3.6	0.1
High-income oil exporters	229	16	14,050	4.1	6.2	-1.1	-7.8	-14.1	-6.4
Industrial market economies	7,477	714	10,480	3.7	2.1	0.7	-1.0	1.5	4.3

*Estimated
+Projected

Source: World Development Report 1985

and this capital flow was used to offset the non-oil LDC deficits. Non-oil LDC external debt rose from \$130 billion in 1973 to \$612 billion in 1982. These new loans were in dollars, relatively short term, and had floating interest rates tied to U.S. prime rates or London Inter-Bank Offer Rate. Then, all of the things that might go wrong did. The United States and Western Europe entered the worst recession in history and total world trade fell for the first time since World War II. Real interest rates rose as the monetary authorities slammed on the brakes to halt inflation. The value of the dollar rose sharply and world commodity prices plunged.

Thus, you had huge debts that were rising in non-dollar terms, real interest rates rising, and export earnings and debt-servicing ability falling. Poland was the first to admit it could not service its debt in 1981. The world financial structure trembled when Mexico joined in August 1982, followed shortly by Brazil.

As country after country joined the list of those unable to service their debts, the International Monetary Fund and the bankers holding the loans began to impose tough economic conditions on these borrowers as the price of extending loan periods and deferring interest payments. Those conditions almost always included reduced imports, increased exports, and reduced domestic government spending and lower budget deficits.

Not surprisingly, this produced recessions and stagnant or falling real per capita incomes in countries that had enjoyed high rates of real per capita income growth in the 1960s and 1970s. And these are economies that have no safety nets for the poor or unemployed.

Then, to further confuse the situation, many of the oil exporters also got into trouble beginning in 1983, and continuing to today. They too had gone on a borrowing binge in the heyday of OPEC power, and when oil markets in the United States, Japan, and Western Europe contracted, many or most of them began to face the same problems as the oil-deficit countries. Venezuela, Nigeria, and Indonesia joined the list of countries with huge debt problems. The World Bank now estimates that the total debt of developing countries was \$895 billion at the end of 1984, up from \$610 billion in 1980.

Given all of this, it is not surprising that the market growth in feed grain markets in these countries has dropped sharply. The only surprise is that the growth in OPEC countries has not slowed as much as might be expected. The food grain market growth in those countries has continued, but a good share of the improvement has been due to

the increased output and consumption in India and thus has not led to increased trade.

Thus, the problem with our markets in the developing countries seems relatively easy to understand but may be very difficult to fix. Market growth has stopped because real income growth has stopped and many countries are having serious balance-of-payments problems. Both of these need to be considered because each creates its own problem.

The balance-of-payments constraint created by the external debt problem puts a limit on the amount a country can import. That constraint has been reduced by the use of CCC export credit. However, that does not remove the internal income constraint, which means that the internal market for the products may not exist unless the importing government subsidizes internal food consumption. But one of the demands of the International Monetary Fund and foreign lenders is that these governments reduce or end their consumer food subsidies. Thus, additional CCC credit, including intermediate credit, does not solve the problems unless there is excess demand for food internally despite the lower incomes.

This means that the only true solution is to get higher income growth in these developing country markets. But, that is not so easy and it is not entirely within our control. There are, however, a number of things within our control that would help.

- Some additional approaches to reducing the drag on these economies created by their debt burdens. These might include writing off some of the debt, changing the terms of the debt, which also writes down its value to the lender, and other measures to change its terms.
- Reduction in the value of the dollar. Since the debt is largely denominated in dollars, this would reduce the local currency costs of debt servicing. Moreover, since the price of oil is also denominated in dollars, it would cut the local currency cost of oil imports for oil-importing countries.
- Reduction in U.S. interest rates, which reduces the cost of debt servicing.
- Maintaining an open market for the exports of these debt-burdened countries. The recent moves to restrict imports of such goods as shoes, textiles, and steel will reduce the export earnings

of the developing countries and their ability to maintain debt service and grow again.

- Developing measures (public and private) to increase flows of new capital to developing countries.

Some or all of these are very complicated economically and, as we have seen in recent months, even more difficult politically. There appears to be increasing agreement that balancing our federal budget would be a major step in bringing down interest rates, lowering the exchange rate, and stopping the drain of world capital into the United States. However, achieving a balanced budget has proved to be beyond our political grasp. Ironically, one of the increasing strains on our federal budget is the federal farm programs to offset the adverse price and income impacts of our declining foreign markets.

Low-income developing countries

Most of the market growth we have seen in the last decade has been in the middle-income developing countries—now called the newly industrializing economies (NIC's). But there is another group of poorer developing countries that have not done well. This has included most of Africa south of the Sahara. In almost every country in this vast region—outside of Nigeria—real per capita income has declined, food production has declined, and per capita food supplies have declined.

The continued existence of this painfully obvious situation is known to us all. It has led some persons to suggest we ought to use much larger amounts of our surplus grains to push forward on a massive food-for-development program. I think, however, that this view is misleading because it represents a misreading of the conditions that made it possible for some large amounts of food aid to be used effectively in the 1960s and 1970s.

The USDA now estimates that 69 developing countries will require some 11.4 million tons of food above their normal commercial imports to maintain consumption at current levels.¹

However, in 1984–85, donor countries will ship an estimated 11.7 million tons of cereal food aid, surpassing for the first time the 10 million ton target set by the World Food Conference in 1974. The USDA also estimates that an additional 19.4 million tons of food would be

¹*World Food Needs and Availabilities, 1985*, Economic Research Service, U.S. Department of Agriculture, July 1985.

required to bring all of the people in these 69 countries up to a minimum nutritional standard. However, this figure is down sharply from a year earlier when it was 26 million tons. Much of the decline is due to improved conditions in India.

This illustrates part of the problem. India will be a net exporter of food grains this year because its surplus stocks are too high. Yet, there are clearly still large numbers of people in India with inadequate income and, therefore, inadequate diets.

We could and should increase the use of food aid to reduce the still-widespread malnutrition in many developing countries. But the solution to the problem is more nearly a food stamp program than a food aid program. As we saw in the 1960s and 1970s, in some countries, there is a limit to the food aid that can be absorbed in a country without destroying local agricultural markets and incentives. My guess is that we are pushing close to that limit in some African countries now, despite the continued prevalence of hunger and malnutrition.

The concept of food aid as a development tool, as contrasted to strictly famine relief, has worked in the past. However, it requires some conditions that do not appear to exist in many of the poorest countries, especially in Africa. It requires a stable functioning government with a reasonable degree of honesty and efficiency. It requires a minimum infrastructure to move products to and from the population — roads, railroads, and trucks. It requires an indigenous management capability to plan and execute development programs. And it helps if you have a disciplined, literate population.

Our two best examples of food aid contributing to economic development are Korea and Taiwan. They had all of the **above characteristics** and more. Most countries lack one or more of these characteristics and, thus, it is unrealistic to assume that they will become the Koreas of the 1990s. This does not mean we should abandon the idea. It merely means we should view it with caution and approach it on a case-by-case basis.

Many of these very poor developing countries also face external debts that are burdensome, but they were too poor to get commercial loans. Too much of their debt is owed to bilateral and multilateral lending institutions. In many ways, this can be handled easier than the problems of the NIC's.

The main need for many of these countries is an increased flow of multilateral and bilateral development aid. Development aid is not very popular these days, either in the United States or in other devel-

oped countries wrestling with domestic budget deficits. As a result, developing assistance is declining in real terms at a time when income growth in poor countries is lagging and private capital from around the world is flowing to the United States to finance our budget deficit.

Thus, in summary, there are a lot of poor countries with a lot of poor people, many of them with inadequate diets. We could do better on our food-aid both for emergency and development purposes. But apart from the continuing crisis in Africa, most of these countries need more and better capital investment—in people, research stations, transport facilities, manufacturing, and structure. Some, but not all of this, could come from food for development. But to do that without the necessary underpinning in other development aid invites other problems.

I know of no good estimate of how much more grain could be used if we expanded food aid to improve nutrition and increase development. However, it does not even come close to the 18 million tons per year decline in growth in grain use we have seen in the world outside.

Price cutting and building markets

Cutting prices is a common marketing device. Across-the-board price cutting can expand the total market and this may be a good strategy, regardless of what your competitors do. It is an especially good strategy if you can pick up market share because your competitors cannot or will not match your price cuts.

There are several methods of price cutting. One is an across-the-board cut, such as we would achieve today if we sharply lowered our support prices. However, that may cost total revenue in some markets where they do not respond to price cuts and there may not be enough market gain elsewhere to keep your income up. Another method of price cuts is selective through such devices as subsidized credit and special export pricing. This has the advantage of targeting markets where you may both expand total use and pick up market share.

It is important to look at whose price is cut when you talk of price cuts. Is it the price to the ultimate consumer or just to a government import agency that then charges consumers the same? The latter would be the case for the Japanese Food Agency, which buys all Japanese wheat imports. I suspect it would be true in almost every country that imports through a government agency. Therefore, price cuts will save the purchaser's foreign exchange but may not expand the underlying real market at all. Therefore, given the structure of world wheat markets, where 90 percent of the imports are through governments,

price cuts are not likely to expand the market much.

Price cuts that actually reach the consumer would probably expand the feed grain market most if they are passed on to the consumers. Since less of the world's feed grain imports are controlled by governments, we could expect some market expansion there.

Will price cuts be matched by competitors? I would guess they would have to be and that any pickup in market share will come slowly as competitors found it less profitable to continue to expand output. Our own domestic experience with lowering prices to reduce farm output is not very comforting in that regard. You tend to lower land prices more than output.

Therefore, the best and least expensive way to do across-the-board price cuts is by lowering the value of the dollar. That produces no pain on the federal budget or on the domestic farm producers but it has all the positive effects you want abroad in terms of both markets and competitors.

If you cannot get the dollar exchange rate down the next best strategy is to use targeted subsidized credit. It may both expand markets and improve competitive position in those markets. The BICEP program apparently had this same concept in mind, but it has not been a smashing success and might even give price cutting a bad name.

Because of the way both world consumers and world producers are heavily isolated from international agricultural markets, I would predict that price cutting will prove a disappointment to those who believe it will substantially expand markets. For the record, it should be noted that the traded real prices of wheat, rice, cotton, sugar, and corn have all fallen appreciably since 1980, and despite all this, the U.S. use is one of the few that has increased.

Summary and conclusions

Think how much different this world of farm exports, farm income, and farm programs would appear today if world markets were 80 million tons a year higher than they are now and if much of the market growth that has occurred had not been met from increased domestic output in China. We would have a far different view of our domestic farm programs and, probably, even of our competitors.

This loss of market growth has occurred in the face of falling real prices of our exported products. Unfortunately, it also has occurred when both the European Community and our competitors have increased output at rates far exceeding their internal market growth.

Thus, we have intense competition for nearly stagnant import markets. This competition is one in which farm incomes and various treasuries are both suffering.

We have focused our attention on the competition and have paid almost no attention to the problems of market growth, but as almost any business can tell you, when markets are shriveling and overcapacity is growing, things are tough.

I believe we should do more to stimulate market growth than we are now doing. It will require selective price cutting at least, but mainly it involves getting the economies of the developing countries and Eastern Europe growing again. We cannot do much about how they handle their internal affairs, but we should be able to do something about ours. How we handle our internal affairs affects the world economic scene within which these markets must grow. In this matter, as in many others, the famous saying of the cartoon character Mr. Dooley would seem to apply: "We have met the enemy and they are us."

Commentary on The Challenge in Building Market Demand"

Orville L. Freeman

Rapid growth in U.S. agricultural exports, everyone has agreed, is essential to revive farmers and the businesses serving them. This requires regaining a fair share of world trade by improving U.S. competitiveness, and getting total trade in farm products to grow once again.

U.S. government policies can play key roles in bringing about these improvements. Macroeconomic national policies are critically important, but agriculture cannot rely on these policies alone. Adjusting price support levels, another issue of the moment, will make U.S. products more competitive, but such a policy has its limitations. So we come to a third set of policies, which can be described as a broad, comprehensive program of agricultural trade and development assistance, where in the final analysis, the only answer can be found. The United States has abundant agricultural resources and a wide range of trade and development assistance programs that, if used creatively, can build new markets and bring about a major long-term increase in commercial agricultural exports. We are not now using these resources and programs to our best advantage. But we can do so, and we should. This proposal outlines how we can begin that process. What is needed is a broad and comprehensive program of coordinated export development, and economic and technical assistance to bring developing nations into the economic mainstream where they can become paying customers. The historic evidence is clear that economic growth in poorer nations will produce customers for U.S. agriculture.

Of the top ten overseas markets for U.S. agriculture last year, eight had at some time received food assistance from the United States. Every year, South Korea spends more dollars for U.S. farm products than the total American food aid to that country over a period of 25

years. Taiwan and Spain came from nowhere to become more than billion dollar markets for U.S. farmers. Other examples are equally dramatic.

The record is clear. In the 1960s and early 1970s, when the middle income countries were experiencing economic growth of 5 to 7 percent, they became an explosive market for farm products, particularly grain. In the years between 1960–63 and 1977–79, they increased their imports of grain by over 300 percent. Had rapid economic growth continued, we would have seen an acceleration in purchases by the 38 low-income countries as well. The result would have been a continuation of the high level of agricultural exports the United States enjoyed in the late 1970s and early 1980s. We would not be in the midst of an agriculture depression today.

U.S. agriculture benefitted directly from demand growth in the 1960s and 1970s. A review of 15 developing countries that experienced rapid economic expansion between 1960 and 1983 shows a substantial increase in commercial imports of U.S. farm products in those countries. Imports of U.S. grain climbed from 4.7 million tons to 26.2 million tons. Imports of U.S. cotton tripled—from 188,000 tons to 593,000 tons. For most of those countries, U.S. food and agricultural aid was a major factor in the development of U.S. commercial markets.

The challenge is to identify the next 15 to 20 countries that have great long-term economic growth potential and to determine how best to help them realize that promise. Based on a preliminary assessment, it is possible to construct a tentative list, including Colombia, Ecuador, Peru, Indonesia, the Philippines, Sri Lanka, Syria, Iraq, Morocco, Mexico, Turkey, Jamaica, the Dominican Republic, Venezuela, Costa Rica, Honduras, and Egypt. There are undoubtedly others.

The President's Task Force on International Private Enterprise points out that the 1983 reduction in U.S. grain production achieved through the Payment-in-Kind program (40 million tons of corn and 16 million tons of wheat) would have been "more than enough to supply the 33 million tons of food needed by developing countries to achieve minimally acceptable nutritional levels." The Task Force concluded that a better way must be found to harness America's agricultural bounty that will provide an appropriate reward to the labors of our farmers, while addressing the food needs of our fellow men."

The nation addressed that problem 30 years ago when a bipartisan coalition passed P.L. 480—the Agricultural Trade Development and Assistance Act of 1954. That authority and the aid and market devel-

opment programs that grew out of it served America well through the 1960s. Food aid needs continued large in the 1970s, but that was a growth decade in which government export programs were less important to U.S. trade than favorable exchange rates and an expanding world economy. Actually, supply in the 1970s was tight. The world had turned, again, from a buyer's market to a seller's market. The U.S. even embargoed soybeans and dropped the economic development marketing building initiative—carried forward so successfully in the late 1950s through 1970. U.S. farm exports have been in a rut ever since. Unfortunately, in the 1980s, the world turned once again back to a buyer's market and with it came another crisis decade for farmers—the most serious since the Great Depression of the 1930s.

Today an informal bipartisan coalition—the Agriculture Export Initiative—is forming. It includes general farm organizations, commodity groups, nongovernment organizations concerned with world hunger, and a broad cross-section of the agribusiness community. We are proposing a five to ten-year program using existing resources in addition to new authorities and funding. It would require that certain existing staffs be combined or integrated to make maximum use of resources that currently are not being well coordinated. It would introduce a great flexibility in the use of funds. Finally, this program would be directed and tailored to countries as individual markets, not to the world as a monolith.

The program outlined above will require specific actions in both the legislative and executive branches.

First: Action by the administration

The administration needs to intensify the current effort to maximize exports in the near term, fully utilizing existing authorities, including P.L. 480, CCC Credit, the new export bonus program, and Section 416 donation programs. Some additional legislation may be needed, including authority to monetize commodities donated to feed hungry people in developing countries and additional measures to counter unfair trade practices of competing countries.

The Department of Agriculture needs to be strengthened as the agency with the leadership role in agriculture exports. Country expertise will have to be expanded. The design of export assistance and market development programs tailored to meet individual country situations will require an understanding of commodity production, trade patterns, the strategies of competing exporters, and the develop-

ment of strategies and programs that maximize the effectiveness of food aid by stimulating economic growth and dealing with balance of payment problems.

There need be no budget restraints on the use of P.L. 480 commodities. The President's Task Force on International Private Enterprise documents, based on careful analysis by the Economic Research Service in the USDA and the Joint Congressional Budget Committee, found a two-to-one benefit cost ratio by using our agriculture carryovers rather than "sitting on" growing so-called surpluses. If there is a problem, it is an accounting problem, which a little imagination could solve, rather than a real budget problem.

The development and technical assistance activities of the Agency for International Development (AID) need to be strengthened. And greater coordination among federal departments is needed, especially between USDA and AID to ensure maximum thrust and a common direction for U.S. development assistance tied to market development.

The administration should be prepared to make long-term commitments to countries that make a firm, long-term public commitment to support agreed-on market and economic development strategies and policies. This will give importing countries confidence in the availability of U.S. food (as a capital and development input) and make them more willing to make long-term investments and needed policy changes.

Flexibility must be emphasized. The administration should take a more flexible approach to funding agricultural export initiatives and encourage Congress to do the same. There should be flexibility in shifting U.S. assistance among countries, commodities, and the various export assistance programs.

To execute such a broad and comprehensive agricultural development and export strategy, it will be necessary to cut across several government departments and to involve national and international public and private organizations. Its success will affect a great many countries and thousands of private firms. A wide range of resources, initiatives, activities, and goals in both the private and public sectors will have to be tied into logical and sensible packages—a challenge far beyond what is now being performed by any department of the U.S. government.

Accordingly, a new leader-spokesman to articulate and coordinate a new agriculture policy (in effect, a new foreign economic policy) for this nation, and indeed for the world, is needed. This person should be

a presidential appointee with ambassadorial rank, but without line responsibility. This leader should have the complete confidence and support of the President and direct access to him. With such support, he could coordinate across the entire U.S. government and the private sector, speaking with one voice on behalf of the President on a range of issues and topics important to U.S. agriculture. This person should also maintain direct contact with foreign governments of targeted countries at the highest level in concert with the Secretary of State, resident U.S. ambassadors, the Secretary of Agriculture, and the Administrator of AID to negotiate sound development and trade agreements and monitor and measure progress made toward agreed-on goals.

Second: Actions by the Congress

The Food Security Act of 1985 called on the President to appoint such a Special Assistant for Agriculture, Trade, and Food Aid. The Food Security Act also broadened significantly authorities and appropriations so that a more aggressive economic development market-building initiative can be carried forward.

The development of country expertise within the administration should be supported through consolidation of existing expertise within USDA, (as for example, the foreign economic work of the Foreign Agricultural Service, Organization for International Cooperation and Development, and Economic Research Service). Funding for Washington and field operations should be expanded and country knowledge within the market development and cooperator programs should be strengthened.

Congress should play an active oversight role in the foreign trade and development areas, meeting with the administration at least twice a year, and possibly quarterly, to review programs and problems. The Senate and House Agriculture committees should have primary responsibility for oversight activities, recognizing that coordination with budget and foreign relations committees may be required.

There is considerable skepticism as to the effectiveness of P.L. 480 in using our food surpluses in combination with other economic development resources to strengthen the economies of developing countries thereby building commercial export markets. Mistakes were made in the 1960s. Sloppy administration, poor leadership in the developing countries, and loose surveillance by the USDA and AID meant counterproductive results in some instances. However, on balance, the results were very positive. We have learned a lot over the last 25 years.

In my considered judgment and that of those who make up the growing agriculture export initiative, it is time to 'do it again." Such an initiative worked in the 1950s and 1960s, and it will work again. There is much more to win, than to lose, by trying!

Commentary on "The Challenge in Building Market Demand"

Jerry M. Hiegel

Dr. **Hathaway** has given a thoughtful and thorough presentation on the subject of building market demand. I find myself in basic agreement with the tenor of his presentation.

Dr. Hathaway's paper reminds us that we need to go back to the basics. He reminds us that the problems of U.S. agriculture in the **1980s** are not the result of our domestic agricultural programs. The 1981 agricultural bill was not all that much different from those in the 1970s. And the problems are not the result of unfair competition, which really did not change that much in a decade. Most of our problems can be traced to unusual events in the 1970s that led to considerable disruption of normal markets. The oil shocks of 1973 and 1978, the unusual weather patterns and droughts in key production areas during the **1970s**, the extension of unusually liberal loans to emerging markets that temporarily spurred demand, our failure to deal with escalating inflation at home, and our low and even negative real interest rates all played a part in making commodity markets in the 1970s very volatile and, in general, unsustainably optimistic. And although this forum deals primarily with international problems, I believe the agricultural problems of the 1980s also have domestic origins as well and I will return to that topic later.

The oil shocks drained liquidity from the Free World and especially the developing countries, leading to excessive bank loans, recycling as it was called. Eventually, this led to some of our customers spending part of their available income for debt servicing rather than for the purchase of grains and oil seeds. Defensively, some of our customers sought to produce more of their own grains and oil seeds in an effort to reduce their imports. In this environment, the transfer of production

technology was greatly accelerated, contributing to increased local production in some countries.

Since some, perhaps most, of the causes of our agricultural problems of the 1980s lie outside of agriculture, it is likely that some of the solutions do also. A more balanced federal budget, lower real interest rates, and less volatile financial markets would help.

We have seen how, despite a seemingly generous 1981 agricultural bill with considerably higher target prices and loan rates, that in the succeeding four years, real commodity prices collapsed, incomes of farmers from commercial markets fell, and land prices plummeted—all that despite the infusion of several tens of billions of public dollars into agriculture. The economics overwhelmed the politics. What happened in the world and domestic markets overwhelmed what happened in Washington. We need to get back to the basics—the expansion of markets based on the customer's productivity and ability to buy—and to our ability to produce efficiently at low cost.

That does not mean we should not try to change agricultural policy or change and improve agricultural programs. But we should realize by now that these programs will not always prevent problems. I have developed considerable respect for the markets. To paraphrase Dr. Hathaway's last sentence, We have met the markets and they are bigger than any of us."

I congratulate Dr. Hathaway for his emphasis on markets and marketing. I have spent nearly 40 professional years in the meat industry and have lived and managed through an era of rapidly expanding domestic markets for red meats and more recently an era of contracting markets. And I can assure you, many of Dr. Hathaway's statements rang loud bells. For example, in his conclusion, he states, We have focused our attention on the competition and have paid almost no attention to the problems of market growth, but as almost any business can tell you, when markets are shriveling and overcapacity is growing, things are tough?

Dr. Hathaway may have been discussing the export markets of the U.S. agricultural sector when he penned those lines, but he could have been analyzing the U.S. domestic red meat industry. From the time I started with Oscar Mayer in 1946, I saw the demand for red meat expand more rapidly than population until the early 1970s. Then, for many reasons that we do not have the time to discuss here, the demand for red meat slowed during the 1970s, and, since about 1979 has been in full retreat.

Although this conference and Dr. Hathaway's paper are concerned with international trade and international markets, I believe the rapid decline in U.S. domestic meat demand that we have experienced, especially since 1979, is a much larger part of agricultural income problems here in the 1980s than is generally recognized and deserves some comment here. From 1979 to 1984, while personal disposable income rose 49 percent, spending for all meat at retail increased only 11 percent, and spending for beef and pork rose less than 8 percent. In only five years, spending for beef, pork, broilers, and turkeys fell from 4.23 percent of disposable income to just 3.15 percent. For the first half of 1985 it was 2.97 percent. To show the magnitude of that six year decline, if that downward trend of 1.26 percentage points in six years were to continue, there would be no spending for meat by the year 2000.

The **real** demand for beef and pork at retail has fallen about 20 percent since 1979. On a per capita basis, it has fallen about 25 percent in that time. Most of the demand collapse has been exhibited in much lower real retail prices. This kind of demand decline is unprecedented in our industry since the 1930s.

And I can assure you it has had an effect on our industry. Real sales in the red meat industry declined 30 percent from 1973 to 1984—and 24 percent in just five years from 1979 to 1984. Real net earnings of red meat packers and processors fell exactly 50 percent from its all-time high in 1971 to 1981, and 41 percent from 1979 to the low so far in the 1980s. The real net worth of all red meat packers and processors fell 42 percent from its peak in 1973, and in 1984 was lower than at its lowest level of the 1930s.

However bad this decline has been on meat packers, it has been as bad or worse on agriculture, particularly the agriculture of the upper Midwest. From 1979 to 1984, the gross income derived from cattle, calves, hogs, sheep, and lambs fell from \$45.5 billion to \$41.4 billion. In real terms, it fell 33 percent in those five years—to the lowest level since 1965. In my career, I saw gross income from these animals rise from less than \$31 billion (in 1984 dollars) in 1956 to over \$65 billion in 1973 and back to \$41 billion in 1984. And it is likely to be lower again in 1985. These tremendous changes in gross income from meat animals were largely the result of first increases, then decreases in the demand for meat in the market.

The sluggishness in the domestic demand for meat in the latter 1970s was overshadowed completely by the rapid expansion in export markets for agriculture described by Dr. Hathaway. But when both the

export and the domestic markets collapsed in the 1980s, the agricultural sector, now in a much more leveraged financial position, has come on very difficult times.

It seems that Dr. **Hathaway** is reminding us that we must look at the importance of the market, that good markets must be built first on real income and productivity of the purchaser and not on increased debt of the latter alone. In addition, there are going to be other competitors, other suppliers, other sellers in any reasonably open market. He reminds us that the international market is far more complicated than the domestic market. The international market is subject to many political considerations, foreign currency fluctuations, global weather variations, and changes in productivity and technology that have an impact on supply. There are also the various demand trends in all the many countries that make up the international market. It is a very complex mechanism.

We are reminded that the type of diet is very important to the total demand for grains and protein crops. With a subsistence grain diet, something like 400 to 500 pounds of grain is needed per person per year. As one's diet changes to include the consumption of animal and poultry products, such as eggs, milk, cheese, and meat, the use of up to 1,500 to 2,000 pounds of grain is needed per person per year to provide the diets that are common in the United States, Canada, much of northern Europe, and the USSR. Typically and historically, these diets are attained only in higher income, developed countries. Thus, we are reminded that it is not just populations that make markets, it is also the ability to buy and the desire to buy. The development of international markets must begin with the development of sound producing economies. And as Dr. **Hathaway** correctly points out, a more complex and expensive infrastructure is needed to support the use and demand for perishable animal and poultry based products than is required for a grain based diet.

The process of building more productive economies that increase consumer demand generally also involves processes that allow and perhaps encourage the agricultural producing sectors in those same countries also to become more efficient and productive. Thus, formidable competition for the U.S. producer is developed and the growing foreign market may not always yield a new and enhanced outlet for U.S. agricultural production. Sometimes, we may be discouraged that we may assist in building and rebuilding economies only to see them become stronger competitors rather than stronger customers. Such a **circum-**

stance must be considered a success for humanity, even if it cannot be considered a commercial success.

It is possibly outside the scope of Dr. Hathaway's paper to comment on the role of population growth rates on building market demand. I do not know what an optimum population growth is for an underdeveloped or a newly developing country. However, it appears that excessive population growth in parts of the world is inhibiting the pace at which some countries can increase their productivity and real income and thereby become consumers of a significant amount of animal and poultry products and therefore significant consumers of U.S. grain exports.

I suspect that some basics applicable in our domestic businesses are also necessary to enhance and build our export markets. We have to be a reliable source with consistent quality products year in and year out. I believe that we have the agricultural productive capacity, the transportation, storage, and financial institutions to compete with any other country in this regard. We have to know our customers and consumers, how to do business in international markets, and when price reductions will help make a sale and when they will not.

Like it or not, at this time in history, the U.S. agricultural production machine is capable of producing much more grain and protein crops than the United States can consume internally. Recent trends toward weaker domestic meat demand only magnify this fact. The momentum of changing from red meat consumption to white meat consumption adds to the excess capacity problem. It takes about half as many acres of grain to produce a given amount of poultry meat as it does to produce an equal amount of choice grade beef and pork.

Thus, we have to look outside our borders for customers. Dr. Hathaway reminds us how much we need these markets—how important they are to our agricultural sector. It is back to the basics—get our production capability and cost structure to the point of efficiency where we can compete effectively in the world market—and find and develop the markets with merchandising skill that is second to none.

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