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# **NONMARKET AND NONECONOMIC CONSIDERATIONS IN EVALUATING AGRICULTURAL TRADE POLICY: THE CASE OF THE REPUBLIC OF KOREA**

**Michael V. Martin, Shin H. Huh, and John A. MacDonald<sup>1</sup>**

## **Introduction**

Economic theory argues for free and unrestricted international trade on the basis that world society is best served through resource use efficiency associated with exploitation of the comparative advantage of each participant in world markets. Analysts use the comparative advantage criterion to evaluate and prescribe the trade policy of individual nations. Policies which interfere with or prevent the exploitation of comparative advantage are deemed socially undesirable. Policies which enhance or encourage specialization and trade consistent with the comparative advantage criterion are viewed as efficient and desirable. For example, Anderson has used this criterion in assessing existing agricultural trade policy for the Republic of Korea. He further uses this analysis of comparative advantage dynamics to prescribe some general policy recommendations.

While comparative advantage is certainly a valuable analytical precept, it is in most cases only a starting point and not the only possible policy assessment criterion. Strict application of the comparative advantage criterion suffers from the inability to fully appreciate and account for costs of a prescribed free trade policy or nonmarket or noneconomic benefits from a trade protectionist policy. This shortcoming is particularly evident when one attempts to apply a strict comparative advantage based evaluation of agricultural trade policy in a rapidly developing country, such as the Republic of Korea. This paper is intended to briefly review some of the nonmarket or noneconomic costs, benefits, and considerations which should be kept in mind when assessing agricultural trade policy. The Republic of Korea (henceforth referred to as Korea) is used as a representative case.

There is ample evidence to suggest that Korea's comparative advantage rests with an abundance of labour as an input into labour intensive manufacturing (Anderson; Clark; and Westphal). Moreover, Korea has an apparent comparative disadvantage in the production of many if not most agricultural products (Jun). Application of strict economic efficiency criteria would suggest that Korea should focus its efforts on expansion of labour intensive exports to trade for agricultural and food product imports. However, a more complete view of the socioeconomic and political complexity of Korea provides an explanation if not a justification for protectionist policy philosophy with respect to Korea's domestic agriculture.

## **Security and Food Self-Sufficiency**

Even the most casual observer in Korea is struck by the intensity with which national security is pursued. There is a clear sense that Korea sees itself as an island in a potentially hostile neighbourhood. To the north is the 40-year enemy, the Democratic People's Republic of China. To the west is the giant People's Republic of China. To the east is Japan, an economic ally, but also a nation whose 35-year occupation of Korea has left a legacy of animosity and distrust.

The need to be prepared to go it alone if necessary places a high premium on self-sufficiency. As Whang (p. 93) points out, "The supply of food, in broad terms, comes from two major sources: domestic production and imports from abroad, including foreign aid, but the import of food would not be favourable to the country in the long run because of the accumulated burden of foreign exchange and national security considerations. The main emphasis of any policy concerned with food supply must be the maximization of domestic production."

Each of Korea's 5-year plans has included a reference regarding the need to pursue food self-sufficiency. Yet over the past two decades Korea has failed to achieve this goal (table 1). While holding its own in rice, meat, and pulses, Korean agriculture has not been able to meet domestic demand for wheat and barley. Moreover, where self-sufficiency has been attained, it has been heavily influenced by programs to limit domestic demand.

**Table 1. Korea Self-Sufficiency Ratio in Certain Agricultural Commodities**

Commodity	Year					
	1962	1968	1970	1975	1977	1979
All cereals	0.92	0.88	0.77	0.71	0.70	0.63
Wheat and barley	0.68	0.72	0.66	0.47	0.04	0.08
Rice	1.02	0.93	0.84	0.91	1.00	1.00
Pulses	1.00	1.00	1.00	1.00	1.00	0.96
Beef	---	0.99	0.99	1.00	0.99	0.98
Pork	---	1.00	0.99	0.99	0.99	0.99

Between 1970 and 1979, aggregate consumption of pork increased by 54 percent, beef by 30 percent, and rice by 18 percent. Over the same period, combined wheat and barley consumption increased by 523 percent. Korean consumption apparently shifted towards products supplied in excess in world markets, specifically cereal grains.

Past failures to achieve greater food self-sufficiency have resulted from: the shift in comparative advantage away from agriculture, U.S. promotion and concessional food sales programmes, and conflicting economic objectives which give rise to inconsistent agricultural and food policies.

The 1970s saw solid and consistent economic growth in Korea. Gross national product increased at an average annual rate of 10.9 percent. Much of this growth was fueled by expansion of the labour intensive export oriented manufacturing sector (shoes, textiles, electronics, etc.). However, as the Korean case indicates, sustaining growth in that sector requires a reliable supply of low priced food sufficient to feed a rapidly urbanizing labour force.

The most desired method of meeting urban food needs is through increased domestic production. Korea has pursued a variety of policies aimed at increasing agricultural output. These efforts met (and are meeting) with reasonable success. Between 1963 and 1973, agricultural output increased by an average annual rate of 2.23 percent. Between 1973 and 1977, this rate was 8.81 percent (Ban, p. 2). This has been accomplished at least in part through government sponsored research and development efforts and subsidies for productive inputs such as fertilizer.

Still, to meet the growing food needs of the urban population, agricultural imports increased substantially. For example, between 1962 and 1979, net cereal imports rose by more than 900 percent, from 0.5 million metric tons to 4.8 million metric tons. Virtually all these imports came from the United States, much of it under P.L. 480 subsidy programmes.

Limitation of domestic demand, government promotion of domestic production, and more careful control of food imports are three elements in Korea's trade and agricultural policy complex which are likely to be more intensively pursued in the coming years. Protectionist policies designed to minimize reliance on food imports may be explained in part by the high priority placed on self-sufficiency as part of Korea's intense national security concern. As Kim (p. 37) points out in conjunction with a discussion on the food security issue, "International trade policies on agricultural products should be carefully planned in harmony with domestic farm production and income policies...In particular, increases in the import of agricultural products, which are competitive with the domestic production, need to be gradual so as to avoid an abrupt impact on the farm economy."

### **The Rural Equity Issue: Saemaul Undong**

While this low cost source of supplemental food contributed to development in the manufacturing sector, it served to depress farm prices and, in turn, farm incomes. As a result, the agricultural sector and rural Korea failed to fully participate in rising Korean prosperity (Jun, p. 3). Between 1955 and 1977, agriculture's share of the gross national product declined from 46 percent to less than 20 percent (Moon, p. 157). Between 1970 and 1975, the industrial wage rate increased at an average annual rate of 8.5 percent while agricultural wages increased by 1.5 percent.

In recent years, the Korean government has become increasingly aware of economic disparity between urban and rural dwellers. As a partial remedy, the government under President Park initiated Saemaul Undong--the new village movement--in 1971. The commitment to the spirit of this project has been reaffirmed by the government of President Chun.

Saemaul Undong includes a number of projects intended to improve the quality of life in rural areas. While Saemaul Undong has, at least partially, succeeded in bringing modern services to rural Korea, it has become increasingly clear that the state of the rural economy will not improve significantly until prosperity comes to agriculture.

Most observers agree that farm incomes can be enhanced through a combination of: improvement in production technology and farm prices. It is likely that each will require continued government participation (and intervention). Thus if the government is to succeed in its commitment to rural development, it may be necessary to protect farm producers from import competition, and to encourage production of import substitutes.

Further, improvement in the agricultural economy is important in regulating rural-urban migration. At the outset of the industrialization process, growth in the urban population was necessary in order to provide factories with large quantities of low cost labour. However, as economic growth has moved toward more capital intensive industry, the need for expanding supplies of industrial labour has abated. Korea is reaching the point where additions to the urban population are creating an economic and social drag in excess of the incremental benefit. Moreover, the outmigration of rural labour, particularly young workers, has adversely affected agricultural development. As Moon (p. 161) points out, the farm labour force has become increasingly older and female.

Increased farm income can serve to slow or even reverse the flows of population to the cities, thus relieving pressure on urban services. Simultaneously, agricultural productivity can be improved if the young and educated are encouraged to stay on the farm.

## Balance of Payments, Foreign Exchange, and Vital Imports

The agricultural trade policy of Korea cannot be evaluated independently of the larger complex of trade issues and realities. As suggested previously, Korea is a relatively high cost producer of many agricultural commodities. The comparative advantage criterion would suggest that Korea relies more on low price food imports. However, food importation requires an expenditure of foreign exchange reserves. In the Korean case, priorities for expenditures of foreign exchange dictate that commitment to agricultural imports be limited.

The Korean industrial sector relies completely on imported petroleum. The growth of industry has been accompanied by parallel growth in the importation of oil (see table 2). Moreover, the precipitous rise in world oil prices in the late 1970s places a severe burden on foreign exchange reserves. Between 1962 and 1979, Korean expenditures on petroleum imports increased by 248 times. Further, Korea ceased to be eligible to purchase food with soft currency under the U.S. P.L. 480 programme in the late 1970s. Thus food imports demand hard currency expenditures. In order to maintain petroleum import levels to meet industry's needs, foreign exchange commitments to other import products such as food must be limited. In a sense, the demand for agricultural imports becomes unit elastic, in that the foreign exchange commitment to food imports is controlled so as to maintain liquidity to purchase oil. Thus when market prices for food imports rise, the Korean government may find it necessary to restrict purchases.

**Table 2. Value of Korean Imports of Petroleum, 1964-1979**

Year	Imports Mil. U.S.\$	Year	Imports Mil. U.S.\$
1964	12.5	1972	206.3
1965	23.7	1873	274.5
1966	29.8	1974	965.8
1967	38.0	1975	1,271.2
1968	70.7	1976	1,609.3
1969	98.7	1977	1,931.3
1970	118.9	1978	2,190.1
1971	178.8	1979	3,103.7

Korea can produce food domestically even though the resource cost is relatively high. However, no domestic oil production is possible. Thus, if Korea is to exercise its comparative advantage in manufacturing, it must maintain stable supplies of imported petroleum. To do so it may be necessary to pursue a protectionist policy in trade in products (in this case food) for which Korea suffers a comparative disadvantage.

The strict comparative advantage free trade doctrine fails to appreciate problems associated with limited access to hard currencies. Free trade cannot occur in a world where certain currencies are not fully acceptable for transactions.

## Food Imports and the Traditional Diet

The traditional diet is a component in the Korean culture. Moreover, many Koreans view the traditional diet as nutritionally superior to western alternatives. Heavy reliance on imports, however, can lead to changes in diet, as suggested earlier by the shift in consumption toward wheat and barley products.

Individual importing nations cannot, through the exercise of demand in the world market, influence the mix of food products made available by exporting countries. That is to say small importing countries are forced to take what is made available by large exporters. Often what is available is surplus production aimed primarily at domestic markets. Thus Korea's reliance on the United States for food supplies may lead to the westernization of the Korean diet. The social value associated with the preservation of tradition cannot be assessed in strict comparative advantage terms.

### Conclusions

This paper reviewed concerns and considerations which serve to explain why a country such as Korea might pursue protectionist policies in agriculture even when confronted by a substantial comparative disadvantage. In the Korean example, a number of nonmarket and noneconomic factors combine to create a strong incentive for government intervention on behalf of domestic agriculture. What should be obvious to the reader is that the Korean society, and thus the Korean government, is faced with often contradictory policy goals. The need for elastic supplies of low priced food to support industrial development may run counter to the desire to attain self-sufficiency for national security purposes. Further, foreign exchange considerations may lead to policies which intend to minimize expenditures on food imports so as to maintain liquidity for purchasing vital petroleum imports. Also, cultural concerns may lead to resistance to diet changes associated with food importation.

Korea was used as an illustrative case partly because it is an economy and society in transition. As it moves rapidly into the developed world, Korea faces many of the stresses associated with maintaining a level of distribution of income gains between the urban industrial and rural agricultural sectors. Both equity and political considerations require that policy address this dilemma.

It should be noted, however, that conditions in Korea are not wholly unlike those in other small developing nations. Jabara and Thompson (p. 197), in their analysis of Senegal's agricultural trade policy, conclude "...that a country may be better off at a more diversified position than would be prescribed by a conventional cost analysis...free, undistorted trade may not be the best policy for all small countries to follow." The implication of this discussion is that economists, in the effort to assess and advise on matters of agricultural trade policies, must temper their strict comparative advantage analysis with a complete understanding of the myriad of social and economic conditions and goals in the country in question. The methodology of economics must be adapted so as to explicitly account for noneconomic or nonmarket costs and benefits. The traditional methodology of the economist can be used as no more than a starting point in such an undertaking.

### Note

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## OPENER'S REMARKS—Eric Monke

The papers presented in this session provide three very different views on the role of international trade in the development process and on the importance of comparative advantage and economic efficiency in the evaluation of policy. O'Hagan et al. argue that production policies should proceed on the basis of domestic consumption requirements and the desire for self-sufficiency. Martin et al. suggest that such nonefficiency arguments allow the policymaker to ignore the dictates of comparative advantage. Koester's study of the EC sugar market provides an empirical assessment of the tradeoffs between efficiency and nonefficiency objectives of policy. My remarks attempt to focus on the policy related aspects of the papers.

The "trade as residual" approach is provided by the FAO projections exercise (AT 2000). Income and population growth generate increased demand, production increases are limited by land and water availabilities, and international trade fills the gap. The results are interesting and refreshing for they suggest that the global availability of fixed factors of production (land and water) is sufficient to allow rapid growth in production and volume of trade. But whether these results have any necessary implications for economic policy at the national level depends very much on views of the role of international trade and world prices. Contrary to the AT 2000 view, I would argue that changes in agricultural policies and patterns of production will flow from international as well as domestic market incentives. If real prices of grain do not increase, as assumed in the FAO study, there seems little in the way of political motivation or economic rationale which would require a country to plunge into self-sufficiency programmes and make major new investments in institutional services, agricultural research and development, or land development. If world grain prices do increase, production responses are likely to vary substantially by country and commodity. Production input costs—particularly land, water, and capital—are not equal across countries, and it is impossible in the context of an aggregate study to identify the best use for fixed factors of production. There is little reason to expect the set of best alternatives to be restricted to cereals.

In short, policy recommendations do not follow from projections exercises. Policy prescriptions may be consistent with such work, but they would be appropriate only by accident. Capital requirements, for example, do not require foreign assistance as AT 2000 implies. Reforms in domestic capital markets which provide positive real rates of interest to rural savers, and access to formal lending institutions by rural borrowers may be the keys to increased capital formation in agriculture. Similarly, projections exercises cannot justify nutritional programmes, land reform policies, or the maintenance of concessional cereal exports by developed countries.

Policy recommendations instead require a detailed evaluation of prospective costs and benefits which result from the encouragement of particular technologies, commodities, or institutions. These evaluations depend on prices of resources, not simply potential availabilities. The contribution of international trade to this evaluation process is the provision of an alternative set of prices for outputs and intermediate inputs. Selection of prices which are indicative of longrun market conditions is no simple task, but the principle of comparative advantage suggests that the evaluation exercise is more appropriate when done with world prices. The major reason for this result is that comparative advantage maximizes the consumption possibilities of domestic factors of production.

Martin et al. indicate that the benefits of economic activities cannot be entirely captured by efficiency related prices. I doubt that analysts of comparative advantage would disagree with this principle. But the presence of nonefficiency objectives in no way diminishes the importance of comparative advantage analyses. The discovery of comparative disadvantage in a particular



activity does not imply that encouragement of the activity is wrong. Rather, such findings indicate that encouragement of the activity imposes efficiency costs on the economy. The measurement of these costs provides valuable information to policymakers because it allows assessment of the value of nonefficiency objectives. Self-sufficiency in grain production may be an important objective, for example, but unless economic resources are in infinite supply and real income levels are irrelevant to policymakers, increases in self-sufficiency ratios cannot ignore resultant economic costs. "Self-sufficiency no matter what the cost" may be a political rallying cry, but the slogan has little credence in a world of scarce resources, low incomes, and government budget constraints. Regardless of objective, efficiency costs are relevant to the policymaking process.

Koester's study of the EC sugar market provides an elegant example of the use of efficiency costs in the evaluation of nonefficiency objectives. World prices for sugar do not represent the right price, but a feasible alternative to existing EC market prices. Feasible alternatives create efficiency costs if the alternative is not exploited. Koester estimates these efficiency costs, but also addresses the nonefficiency objective of income distribution which motivated the distortions in efficiency. As Koester shows, income distributional objectives are not served by the sugar policy, and thus it becomes difficult to justify the efficiency costs on the basis of the stated nonefficiency objective.

While noneconomic objectives are important to the design and analysis of economic policy, care must be exercised in the identification of objectives. For example, Martin et al. argue that foreign exchange availability and balance of payments positions represent potential arguments against the relevance of comparative advantage analysis. This argument is incorrect. On the contrary, consideration of foreign exchange impacts lies at the heart of comparative advantage analysis. Calculation of comparative advantage depends on the relationship between value added, measured at world prices, and the costs of domestic factors (land, labour, and capital), measured at their opportunity costs. The key point is that opportunity costs are defined in terms of foreign exchange earning power. Unemployed factors have zero opportunity cost, but employed factors must be withdrawn from activities which already earn or save foreign exchange. (Nontraded goods complicate the argument somewhat, but do not obviate the principle.) If the opportunity costs of domestic factors exceed value added, then the activity under study diminishes rather than increases foreign exchange availability, and the country lacks comparative advantage in the new activity. For example, if value added in a new rice production activity was US\$300 per metric ton, but the domestic factors required to produce one metric ton of rice could earn \$400 if employed in coffee and cocoa production, then encouragement of rice production will diminish rather than increase foreign exchange availabilities. In short, import substitution will not always save foreign exchange. If the activity does save foreign exchange, it will demonstrate comparative advantage. Thus foreign exchange and balance of payments considerations cannot be considered as nonefficiency objectives.

Free trade in agricultural products is neither likely nor necessarily optimal, and there is little in comparative advantage analyses which requires free trade. Rather comparative advantage recognizes that international trade provides marketing opportunities for agricultural producers additional to domestic opportunities, and thus may represent sources of increased income. Attempts to develop policies which ignore these opportunities imply that absolute income levels have no linkages to the process of economic development. It is difficult to imagine that many agricultural producers would share such a view.

## OPENER'S REMARKS—W. J. Anderson

AT 2000 sets out the world food requirements in cold numbers along with estimates of the inputs required to achieve secular growth of 3.7 percent per year in food supply. These numbers reveal the formidable task faced by the world to adequately nourish its population. AT 2000 is primarily a study of growth and its implications, but the equity dimension of the theme of this Conference also stands out in the estimates of the number of undernourished persons in the world now and by 2000. The reduction in those numbers must be the most fundamental goal to seek in the pursuit of equity. The trend growth scenario results in 590 million undernourished persons in 2000, an increase of 35 percent over 1975; the high growth scenario would reduce the undernourished population by 33 percent, bringing the number down to 260 million, which is still large in absolute terms and far from fulfilling minimum equity requirements.

The choice of the GDP growth rate of 7 percent per year as the target is certainly the maximum likely to be achieved. On the other hand, it seems to be the minimum rate that will make some headway in the reduction in the number of undernourished persons. The input requirements that go with increasing agricultural growth from the current 3 percent per year to 3.7 percent in the developing countries are impressive: rainfed cropland--21 percent per year; irrigated cropland--55; cropping intensity--21; yields--70; investment--4.4; and fertilizer--8.1. These numbers suggest that to achieve the high growth target, both developing and industrialized nations will have to concentrate on the economic dimensions of the political economy equation for development policy.

For the developing countries this means supporting food production in a positive way and avoiding well intentioned discrimination in favour of consumer interests and urban industrial development: (1) adopt policies which cause capital to flow into food production and support agriculture with investments in the infrastructure; (2) where exports are an important part of agriculture's output, limit taxation to ensure incentive prices to producers and adequate revenue to purchase yield increasing inputs and to leave some economic rent in the agricultural sector; (3) maintain a realistic foreign exchange rate--the tendency to overvalue the currency cheapens food imports and underprices local food products; and (4) provide a mega-increase in research and extension--the observation in the paper that only 20 percent of the world's expenditure on research takes place in the developing countries where 80 percent of the increase in world demand will accrue indicates the need for this essential ingredient for growth. In the economic history of agriculture in the now industrialized nations, the growth rate was much higher after 1913 when research and the application of research results played a major role in expanding output and reducing input-output ratios.

A significant result of both the high growth and the trend scenarios is the increase in net cereal imports; these amounts would double under the high growth scenario and quadruple if the trend scenario prevails. This outlook puts the cereal exporting industrialized countries on the spot. Those countries eager for this trade have to realize that restriction of reciprocal trade with the developing world suppresses growth, serves to maintain international inequities, and jeopardizes their own interest in cereal sales. Certainly a liberal approach to trade must be supplemented by capital and technological transfers through aid programmes, but industrialized nations cannot limit their responsibilities for world economic development to such transfers.

The other two papers record what policies two nations have actually adopted—one, a developing nation, Korea, the other an industrialized region, the European Community.

Korea, in spite of an adequate labour supply available to produce labour intensive exports, and a comparative disadvantage in food production, chose the goal of self-sufficiency for its food policy. The reasons are: security—Korea lives in a "potentially hostile neighbourhood," and Korea imports oil to fuel its industrial growth, a requirement which competes with food imports for foreign exchange.

Under those circumstances, cereals offered at concessional prices under P.L. 480 look attractive but they interfere with the goal of self-sufficiency. Internal agricultural commodity prices which need to rise to overcome the comparative disadvantage are prevented from doing so. Moreover, the policy is inequitable because the rural community does not share the growing national prosperity, and urban welfare is enhanced by low food prices. So policy has to shift to input subsidies and rural programmes to enhance the quality of life and keep the rural-urban migration within the bounds of industrial absorption of labour.

In the case of the European Community's sugar protocol, the author analyzes the working out of a protectionist policy which has made the EC self-sufficient in sugar but has been modified to offer preferential access to certain developing countries. To make it up to the poorer nations, the rich country hands out quotas which provide a market for the amount of the quota at higher than world prices and therefore constitute an income transfer to the developing countries.

The results, however, are weird. While these preferences are granted in the name of equity, the EC has to reexport the amount of the quotas. Therefore importers of sugar, rich or poor, benefit from lower world prices, and the nations receiving the trade preferences suffer a negative welfare change which offsets some of the income transfer. The net benefits fall randomly and capriciously over a range of 22 percent of GDP for Mauritius to a negative amount in the case of India.

I have a few concluding remarks. Although I have taken the results of AT 2000 from which to draw inferences, I would have felt easier if I could have seen the results of one or two price scenarios. Relative prices are not neutral in the real world as the model supposes, and changes in them can have a marked effect on output, as other papers have shown. The need to examine the price scenarios is the more vital because the results suggest that the terms of trade for food commodities will increase because of demand-supply interaction under either high growth or trend scenarios.

The magnitude of the task implicit in the high growth scenario will strain the resources of the world and challenge policymakers to orient policies to minimize economic distortions. A host of political considerations looms before policymakers in every country in the world, to which the Korean and EC papers testify.

In making a judgment on what can be accomplished in agricultural growth over a 25-year period, one also has to take into account the impact of risk and instability caused by shocks to the economy and overreaction to supply and demand shifts. The evidence from an earlier paper at this Conference was that agricultural growth in some now industrialized countries has followed anything but a smooth course.

The results from AT 2000 modified by political considerations and instability suggest that the world will have to settle for no more than the medium growth rate rather than high growth in the developing world. In that case, the number of undernourished in the population will be about the same as today. It seems to me that growth policies will have to be accompanied by a good deal of attention to equity considerations.

**O'Hagan et al.'s Paper**

The trend scenario assumes no negative rates of growth in production. This could occur with political unrest, with resulting famine. Is FAO overly optimistic in its predictions? FAO forecasts assume fivefold increases in energy and irrigation inputs. However, a previous paper argued that energy and irrigation may decline. There is also the possibility of a shift to low input technology and a decrease in farm size with population growth. Has FAO taken these into account? Is the assumption of constant real prices reasonable? Is the situation as bad as suggested? FAO data for developing countries do not always reflect true production due to underreporting; an error of up to 100 percent is possible. Is it better to look to the past 10 years than to use trends to predict to the year 2000? Do problems not arise in taking GDP growth as an exogenous determinant of future demand when agricultural production is an element in GDP? The authors replied that there may be some increase in real agricultural prices over the next 10 years, but the authors predicted relative stability. Regarding comment on declining energy and irrigation, this was not part of their paper. FAO did not consider a shift to low input technology, or try to predict famines.

Economic efficiency versus self-sufficiency represents a tradeoff of economic benefits. It was an FAO assumption that all countries would try to protect their present position regarding basic foods, hence the trend projection. Countries are often afraid of complete reliance on comparative advantage as a solution versus maintenance of a high degree of self-sufficiency.

Large savings and investment projections were made considering a range of values, and considering agriculture in relation to the total economy. The authors felt that their projections were reasonable on the input side. Countries tend to underestimate the need for maintenance capital, which is probably equal to 40 percent (not 20 percent as had been assumed) of needs.

There is a mistaken concept of a strong cross price elasticity between energy and fertilizer prices; a recent World Bank study suggests that it is only 0.2. Fertilizer prices have been volatile because fertilizer has an inelastic demand, but it is not scarce, and capacity has increased.

There is enough profit for farmers to purchase their share of energy inputs. Factor prices to agriculture have generally declined in real terms. As far as fixed resources are concerned, the world is using only half of total available arable land.

On statistics, FAO does its best to deal with poor data. It utilizes an internal checking system, keeps supply and utilization tables crosschecked with nutritional data, and does analysis on a country level. FAO started with 21 detailed studies.

### **Koester's Paper**

How could the EC do something for the developing countries on sugar without negative impacts on sugar exporters, especially other developing countries? There was comment on negative impacts of EC sugar policy and the Lome convention. The analysis ignores the loss to world exporters. It buys ACP goodwill but ignores GATT, gives a subsidy to EC producers, and substitutes domestic equity for international disequilibrium and harms developed and developing country exporters.

In reply, Koester explained that the objective of the analysis was to look only at the impact on ACP countries. To consider all the issues raised would obviously require a much broader analysis.

He disagreed that the EC has achieved internal equity for sugar producers. Its programmes lead to expansion of large producers and as a result benefits are distributed unevenly. He did not disagree with the attack on EC sugar policy, but it is an analyst's task to be objective.

He could agree that EC grain policy which increases production may be of net benefit to developing countries since they are net grain importers. Sugar is an opposite case since cane is largely produced by developing countries. He concluded that external inequity should not be the price of domestic equity.

### **Martin et al.'s Paper**

The Korean economy has been experiencing rapid growth which has inherent social problems. In the 1970s, the country had high rice support policies which they are trying with difficulty to correct. The country wishes to maintain economic growth.

The theory of a country's comparative advantage depends on a free market solution, but if it cannot freely move labour and capital, a second best solution may be rational. The world free market price may not reflect the comparative advantage position of all countries. Is this a good criterion for formation of domestic policy? Noneconomic factors need to be considered.

The authors replied that the points are well taken. The objective of the paper was not to reject comparative advantage but to suggest that it is not the final solution. Relative cost or efficiency is at best a difficult concept, and other noneconomic factors can have an impact. We need to understand the broad social milieu before criticizing policy. The Korea-U.S. bilateral perspective needs to start with an understanding of the Korean situation. Comparative advantage is a valuable concept but not the only one.

Participants in the discussion included Yang-Boo Choe, D. Colman (Session Chairman), Graham Dalton, M. Leupolt, Don Paarlberg, D. Penny, B. F. Stanton, and Martin Upton.