Commodity Market Outlook and Trade Implications Indicated by FAPRI Analysis

William H. Meyers, S. Devadoss, and Bruna Angel

Contents

Tables

Figures

Abstract

A commodity market outlook for wheat, coarse grains, and soybeans is evaluated for the period through the mid-1990s. The projections are based on assumptions about economic growth and agricultural policies that closely resemble current conditions. The projections include world market prices as well as supply, demand, and trade in these key commodities. The evaluation includes detailed breakouts of coarse grain and wheat production, consumption, and trade in major developing countries and regions.

Although grain price projections show stable or declining levels in real U.S. dollars, pressure on per capita consumption remains a problem, especially in Africa. Also, although some of the strong import growth in rapidly growing developing countries is a sign of dynamic economic performance, import growth in many poor countries is an unfortunate necessity brought about by meagre growth in agricultural production relative to rapid growth in population.

Introduction

In this evaluation, a multinational, multicommodity trade model is used to project grain production, consumption, trade, and prices for selected countries and regions for the period 1987/88 to 1996/97. The projections are compared to historical data and used to assess the grain needs of the importing countries.

In evaluating food requirements, factors such as supply and demand conditions in other countries, world market price for agricultural commodities, and economic growth and purchasing power of the importing countries are often ignored. These are important factors in assessing the needs of importing countries, and the trade model used in this study incorporates them. The overall model includes four crops models, each consisting of behavioral components of supply and demand for major exporters and importers.

Before presenting the results, a brief explanation follows of the structure and components of the model and of the assumptions used in the projection. The projections themselves are first presented in general terms for wheat, coarse grains, and soybeans. Finally, a regional analysis is conducted for wheat and coarse grains.

Model Description

The CARD/FAPRI agricultural trade models are dynamic, nonspatial, partial equilibrium econometric models for wheat, coarse grains (corn,

barley, and oats), sorghum, and the soybean complex. All four trade models are used in the analysis; however, detailed results are presented only for wheat and coarse grains. The models are nonspatial in that they do not identify trade flows between regions; the major concern is to identify net quantities traded by each country or region.

While the individual commodity components may be run independently, they are integrated into a larger system with other commodity components through price linkages that permit cross-commodity and cross-country interactions. These linkages between countries and commodities are designed to reflect the simultaneity of the price determination process in the agricultural sector. A simultaneous solution can be obtained to arrive at a consistent market clearing equilibrium for the four commodities. In regions where internal prices are not insulated from the world market, domestic prices are linked to the respective U.S. export prices for corn, sorghum, barley, wheat, soybeans, soymeal, and soyoil.

A descriptive econometric approach is employed in the structural specification that imposes few constraints on the parameter estimation. While the functional form of the models is generally linear, fundamental identities and other such basic variables as relative prices render the models nonlinear. The models include domestic supply and demand functions for major trading and producing countries and regions. Equilibrium prices, quantities, and net trade are determined by equating excess demands and supplies across regions and explicitly linking prices in each region to a world price. Except where set by governments, domestic prices are linked to world prices via price linkage equations, including
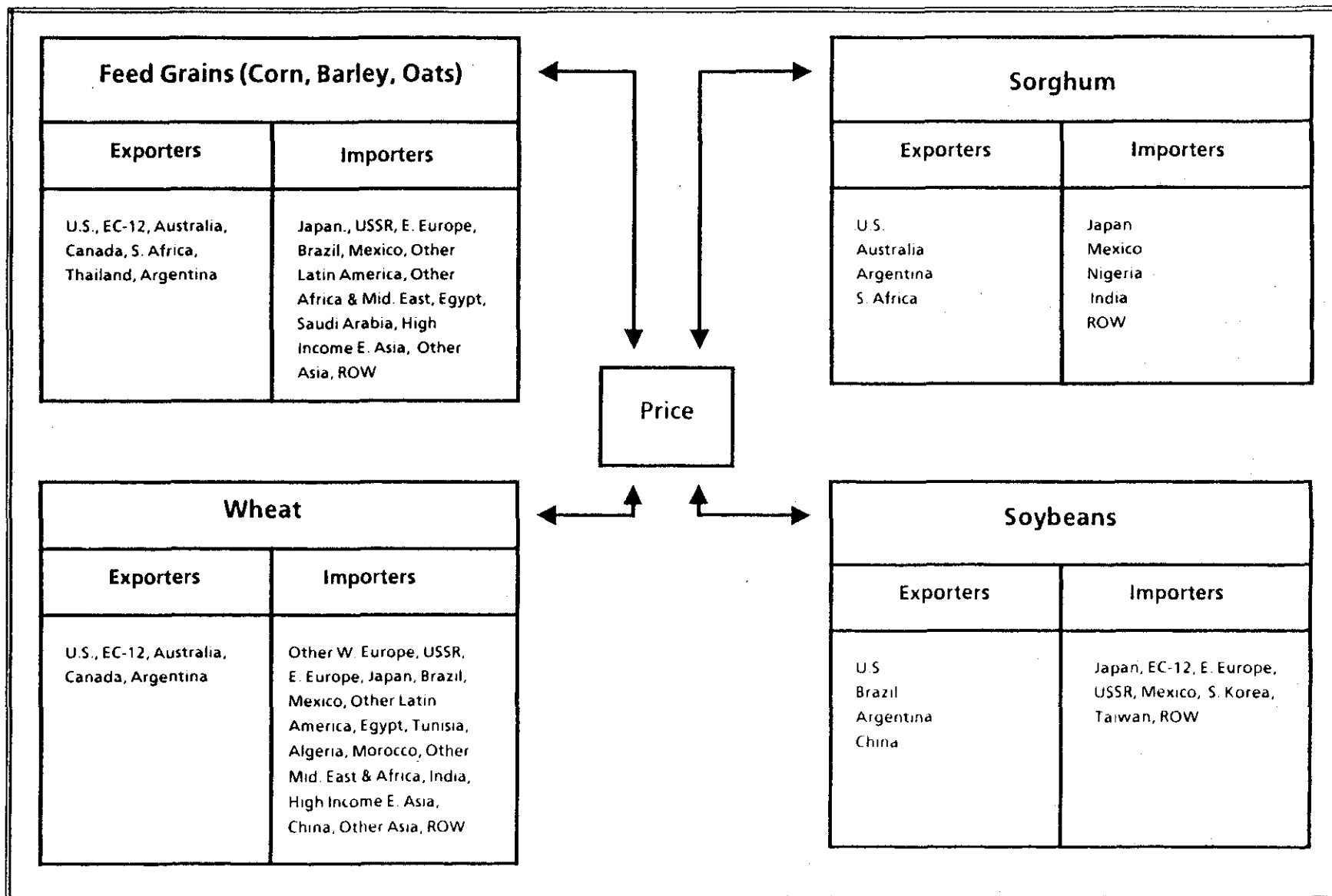
bilateral exchange rates and transfer service margins. Where some degree of insulation of domestic prices from external market conditions exists, the free adjustment of trade flows is restricted. The price linkage equation defines the degree of price transmission of external market conditions into the internal system. Trade occurs whether price transmission is allowed or not. If there is no price transmission, the quantity traded merely adjusts to internal conditions.

Figure 1 illustrates the linkages between the four commodity trade models and the regional and country details of each model. The coarse grains model includes corn, barley, and oats, with sorghum modeled separately. Within this crop group, the supply and demand of the one or two most important crops in each country or region have been modeled. The net import demands (export supplies) of the endogenous commodities have been added (with a weight equal to one) to the exogenous net trade of the minor commodities to find the net imports (exports) for all coarse grains. The market equilibrium identity is defined in terms of the aggregate commodity--coarse grains.

Because coarse grains and sorghum are used chiefly as feed, this derived demand is therefore of primary importance. Although the portion of coarse grains directly consumed for food compared to total usage is small, their proportion for nonfeed uses is large in Africa and is rising significantly in the EC-12 and the United States. In these areas, coarse grain used as food is determined endogenously in the model.

The coarse grain model includes 20 countries and regions, and the demand component is endogenous in all of them. In countries or regions

Figure 1. CARD/FAPRI World Agricultural Trade Models (Annual Econometric System)

Feed Grains (Corn, Barley, Oats)

Exporters	Importers
U.S., EC-12, Australia, Canada, S. Africa, Thailand, Argentina	Japan., USSR, E. Europe, Brazil, Mexico, Other Latin America, Other Africa & Mid. East, Egypt, Saudi Arabia, High Income E. Asia, Other Asia, ROW

Sorghum

Exporters	Importers
U.S. Australia Argentina S. Africa	Japan Mexico Nigeria India ROW

Price

Wheat

Exporters	Importers
U.S., EC-12, Australia, Canada, Argentina	Other W. Europe, USSR, E. Europe, Japan, Brazil, Mexico, Other Latin America, Egypt, Tunisia, Algeria, Morocco, Other Mid. East & Africa, India, High Income E. Asia, China, Other Asia, ROW

Soybeans

Exporters	Importers
U.S. Brazil Argentina China	Japan, EC-12, E. Europe, USSR, Mexico, S. Korea, Taiwan, ROW

where production is important, supply has been endogenized, but in such countries as Japan, where there is very little domestic production, domestic supply is exogenous.

The wheat model is composed of 22 countries and regions. In 16 countries and regions both production and demand functions are estimated. In the Soviet Union, Eastern Europe, and Japan, production is exogenous and domestic demand is endogenized. Other Western Europe and high-income East Asian (HIEA) regions each consist of a net import function. Wheat demand equations are specified generally either as total demand (feed plus food) or as food demand only. However, in those countries or regions where wheat feed use is a significant proportion of total domestic use, as in the United States, Canada, and the EC-12, wheat feed demand is estimated separately.

Assumptions

The macroeconomic, policy, and yield growth assumptions used in the projections are external to the models.

Macroeconomic Assumptions

The macroeconomic assumptions for the projection were provided by the WEFA Group (1987). The macroeconomic environment for the next ten-year period (1987/88 to 1996/97) contrasts sharply with that of the early 1980s. Then, low or negative real GDP growth was experienced by many countries. Although still sluggish, the recovery of the world economies from the performance in the early 1980s has a significant impact on the level of demand and trade over the next decade. The growth patterns in

the developing market economies are diverse, with some countries struggling under heavy external debt, and others, such as the Asian NICs (newly industrialized countries), experiencing sustained growth.

The projection for world economic growth averages 2.8 percent per annum from 1988 to 1992. Significant price declines, lower interest rates, a cheaper dollar, and lower oil and commodity prices signify ongoing adjustments in the world economy. Debt service and high unemployment in individual developing countries remain potential problems. The economic outlook is further influenced by assumptions about oil and nonoil commodity prices, international debt, exchange rates, and fiscal and monetary policies. The baseline implicitly assumes that the GATT negotiations will result in few changes and that protectionist forces are held in check at their historical level of influence.

The projected pattern of economic growth activity in developing market economies is much more fragmented if compared to that of developed economies. Several oil-exporting debtor countries (e.g., Mexico, Venezuela, Nigeria, and Indonesia) continue to stagger under the growing weight of external debt. A reduction in external assets would cushion some of the impact of lower oil prices for the oil-exporting countries of the Middle East and Africa, but the bulk of the adjustment is expected to be accomplished through a decline in domestic demand and imports. For oil-importing developing countries such as the Asian NICs, prospects are good. Lower oil prices, lower global interest rates, and continued expansion of the developed economies combine to boost projected growth above the average for the developing world as a whole.

The debt crisis may worsen somewhat in light of a weaker U.S. and world economic outlook; for example, the renewed debt crisis in Brazil could dampen Latin American growth this year. Continuing structural adjustments in most debtor economies and restrained growth are expected, as these economies reduce investment to repay past debts and make new financial transfers to developed countries.

Pacific Basin. Countries in the Pacific Basin region are expected to have higher economic growth rates in the projection period compared to those of other regions. The projected real GDP growth rate of the Pacific Basin countries is 5.5 percent in 1988, increasing to 6 percent in 1992. The higher economic growth rate of these countries is partly due to their expanding export markets; since this region is a growth market for U.S. exports, higher economic growth rates there should have a positive effect on U.S. exports.

Other Asia and Middle East. The projected real GDP growth rate for this region is approximately 4 percent in the projection period. Since these countries are net importers of food products, their imports heavily depend on their economic growth. In recent years, India and other countries' economies were profoundly affected by severe drought, while Bangladesh was devastated by floods.

Latin America. The projected real GDP growth rate in Latin America averages 2.5 percent over the projection period. Economic growth there is so plagued by the debt crisis that other debtors may now follow Brazil's example of interest moratoria, delayed reschedulings, reduced flows of bank credits, postponed implementation of structural reforms, and more

import and capital controls. This continued adjustment to accommodate foreign debt is likely to restrain economic growth.

Africa. The projected real GDP growth rate of 2.5 percent in African countries is the lowest compared to those of other world regions. This lower growth rate would limit purchasing power to import agricultural commodities in the world market.

Farm Policy Assumptions

The Food Security Act of 1985 has reduced world commodity prices and increased trade shares for the United States. The increases in exports were achieved by allowing target prices to decline slowly while lowering loan rates substantially, adopting marketing loan programs for rice and cotton, and conducting aggressive export enhancement programs. This analysis assumes that current programs will prevail and future legislation will continue, with the objectives of reducing stocks and remaining competitive in world markets. This implies reductions in support prices and continued use of programs to control production and encourage the utilization of commodities currently in excess supply.

Target prices for most major commodities were allowed to decline slowly. In the case of wheat, the target price in 1988/89 was set at $4.23 and reduced to $3.54 by 1996/97. Similarly, the corn target price was allowed to decline from $2.93 in 1988/89 to $2.44 in 1996/97. The baseline assumes a target price reduction of 2 percent per year during the five years following the end of the current farm legislation.

For all program commodities, it is assumed that loan rates will be reduced in 1989/90. In 1990/91, however, cotton, rice, and soybean loan rates will not be reduced, because they will have reached the minimum levels permitted by the FSA85. On the other hand, for feed grains and wheat, loan rates are set equal to 75 percent of the average market price for the previous five marketing years, excluding the years with the highest and lowest prices. A further qualification is that loan rates may not fall more than 5 percent in a given year. Beginning in 1990/91, the 75 percent rule will begin to take effect for wheat, barley, and oats, and loan rates for these commodities will increase from their 1989/90 levels.

The conservation reserve program is assumed to reach its maximum of 45 million acres by 1990/91. The annual acreage reduction program is gradually reduced over time, and the paid diversion is eliminated as CRP expands and market prices begin to increase.

A large proportion of U.S. grain exports is under one or more government programs, including PL-480, various loan programs, and the Export Enhancement Program (EEP). The EEP, a new program created by the FSA85, has played a major role in expanding U.S. wheat and barley exports. Under the EEP, exporters receive generic certificates equal in value to the difference between export prices and the accepted bid prices of countries qualified to buy EEP grain. It is assumed that the EEP and other export programs will be phased out by 1990. As market prices increase and government stocks decline, there is less incentive to utilize export subsidies.

It is further assumed that the European Community will increase its intervention price only slightly over the next decade due to a strain on the European Agricultural Guidance and Guarantee Fund. The initial prices paid by the Canadian Wheat Board to Canadian farmers are assumed to decline because of the lower world market prices.

Yield Assumptions

Production in the forecast period depends on acreage projections and yield assumptions. In most countries acreage is endogenously projected; however, yield growth is assumed to be exogenous. More specifically, when yield is not endogenously estimated, a trend growth rate is assumed.

Commodity Market Projections

The baseline projection (Table 1) was prepared before the onset of the 1988 U.S. drought. The drought will reduce 1988 crop production and increase market prices above these baseline levels. Stocks will be reduced more quickly, and the 1989 planted area will be higher in response to higher prices and reduced U.S. government acreage reduction programs. However, most impacts of the drought will have played themselves out by the early 1990s. This study focuses primarily on the 1990-1996 period; thus, most results of analysis are not substantially affected by the drought.

Real prices of wheat, maize, and soybeans are expected to remain constant or decline over the period 1989/90-1995/96 (Table 1 and Figure 2). In particular, the real price of maize remains nearly constant, while wheat prices decline by 5 percent and soybean prices by

Table 1. Baseline Projections of Wheat, Coarse Grains, and Soybean Supply, Use, Trade and Prices

	Actual	Projected						
	1986/87	1989/90	90/91	91/92	92/93	93/94	94/95	95/96
Nominal Prices ($/mt)								
Wheat[1]	109	134	137	138	138	139	144	150
Maize[2]	74	90	91	94	99	98	100	105
Soybeans[3]	193	211	204	233	215	232	224	228
Real Prices (1988$/mt)								
Wheat[1]	117	131	129	128	124	122	123	124
Maize[2]	79	87	87	87	89	86	85	87
Soybeans[3]	207	205	194	215	194	204	191	188
Wheat (mil. mt)								
World Production	529	535	548	560	572	583	591	602
World Consumption	521	536	549	561	572	582	592	602
World Ending Stocks	176	150	149	149	149	149	149	149
Net Exports								
Industrial	72	79	81	83	85	86	87	89
Developing	-53	-61	-62	-64	-66	-68	-70	-71
CPE (excl. China)	-18	-18	-19	-19	-19	-18	-17	-17
Coarse Grains (mil. mt)[4]								
World Production	752	748	767	792	805	825	838	851
World Consumption	724	764	776	791	802	817	831	845
World Ending Stocks	236	182	173	174	177	186	193	199
Net Exports								
Industrial	41	46	48	51	53	56	59	62
Developing	-27	-31	-32	-34	-37	-38	-42	-43
CPE (excl. China)	-14	-15	-16	-17	-17	-18	-18	-19
Soybeans (mil. mt)								
World Production	98	112	113	114	119	120	124	126
World Consumption	101	110	112	115	118	120	123	126
World Ending Stocks	20	18	19	18	19	19	19	19
Net Exports								
Industrial	1.6	2.6	2.9	3.4	3.6	4.1	4.5	5.0
Developing	0.3	0.3	0.1	-0.4	-0.6	-1.1	-1.4	-1.9
CPE (excl. China)	-1.9	-2.9	-3.0	-3.0	-3.0	-3.1	-3.1	-3.1
Soymeal Net Exports (mil. mt)								
Industrial	-2.1	-3.4	-3.6	-3.7	-3.7	-3.8	-3.9	-3.9
Developing	8.6	10.6	11.1	11.4	11.7	12.2	12.5	12.8
CPE (excl. China)	-6.5	-7.2	-7.5	-7.7	-8.0	-8.4	-8.6	-8.9

[1] Wheat--FOB Gulf #2 H.W. 13 percent.
[2] Corn--FOB Gulf #3 Yellow.
[3] Soybeans--FOB Gulf #2 Yellow.
[4] Maize, Sorghum, Barley, and Oats.
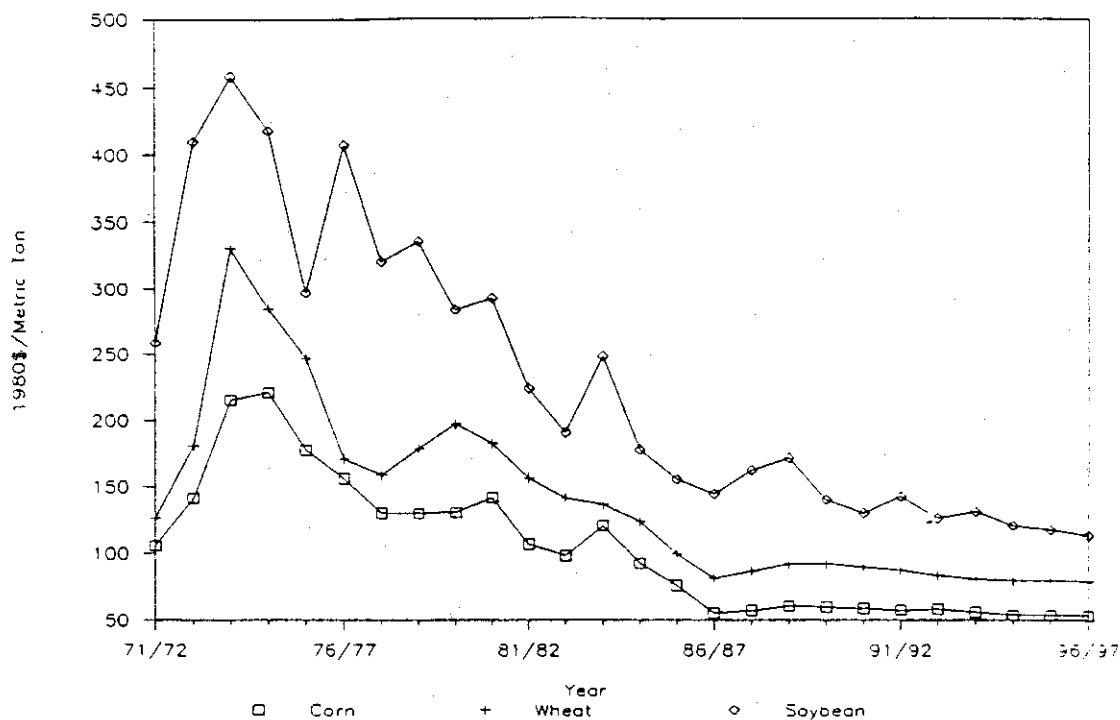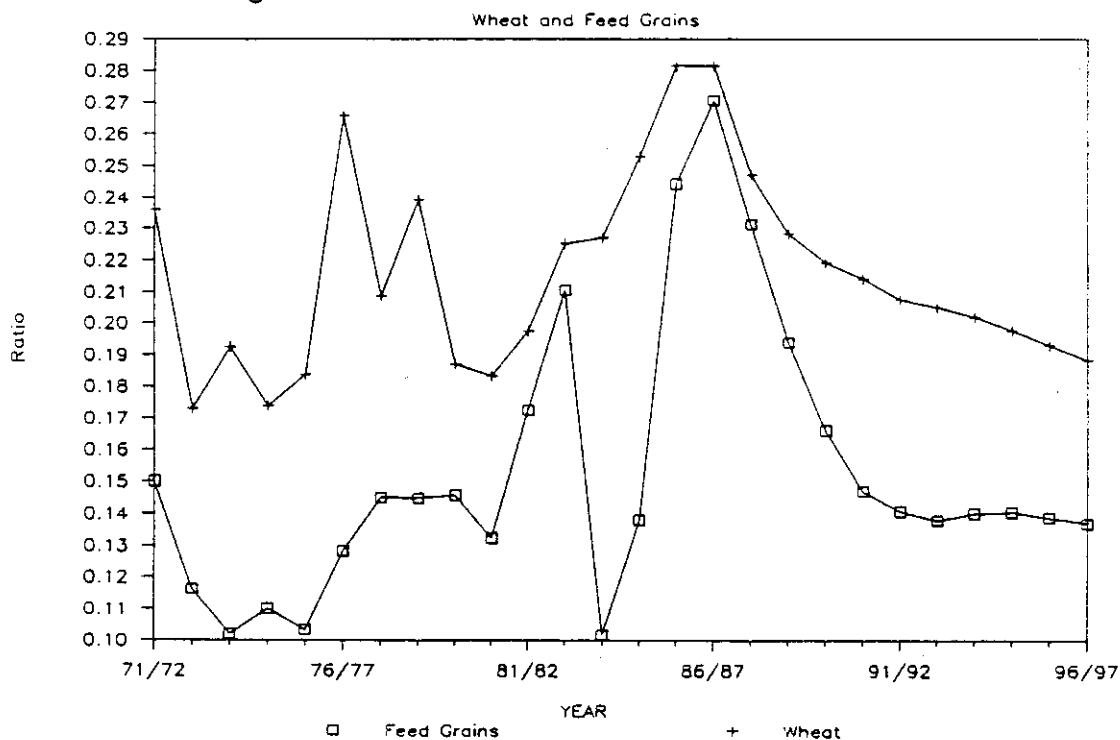
Figure 2:   Real U.S. Gulf Port Prices

Year

□   Corn   +   Wheat   ◇   Soybean

Figure 3:   World Stocks to Use Ratio
Wheat and Feed Grains

YEAR

□   Feed Grains   +   Wheat

more than 8 percent over the period. Thus, although the historical
pattern of declining real prices for these commodities continues, it is at
a somewhat slower rate than during the past decade.

From 1989 to 1995 world wheat production is projected to increase by
12.5 percent, feed grain production by 13.7 percent, and soybean
production by 12.5 percent. Consumption is projected to grow at a
slightly lower pace (except for soybeans) and ending stocks are projected
to remain stable or to increase. The increase in carryover stocks from
1989 to 1995 still leaves inventories well below the high levels that
existed in 1986/87. In fact, the stock-to-use ratios for wheat, coarse
grains, and soybeans are projected to be 0.25, 0.24, and 0.15 in 1995/96,
compared to 0.34, 0.33, and 0.20 in 1986/87, respectively (Table 1 and
Figure 3).

From the projections, trade for grains and soybeans increases more
rapidly than production and consumption. The patterns of change in net
imports and net exports indicate that demand growth continues to outpace
supply growth in developing and centrally planned economies and that
production growth continues to exceed demand growth in the industrial
countries (Table 1 and Figures 4 and 5). This pattern has been evident
for more than a decade, raising concerns about the foreign exchange costs
of the projected imports of developing countries. Using U.S. Gulf Port
prices, the import cost of wheat, coarse grains, and soybeans to
developing countries in 1988 dollars is projected to increase from $9
billion in 1986/87 to $15 billion in 1995/96. The trade picture for
soymeal is different: Argentina and Brazil are projected to export an

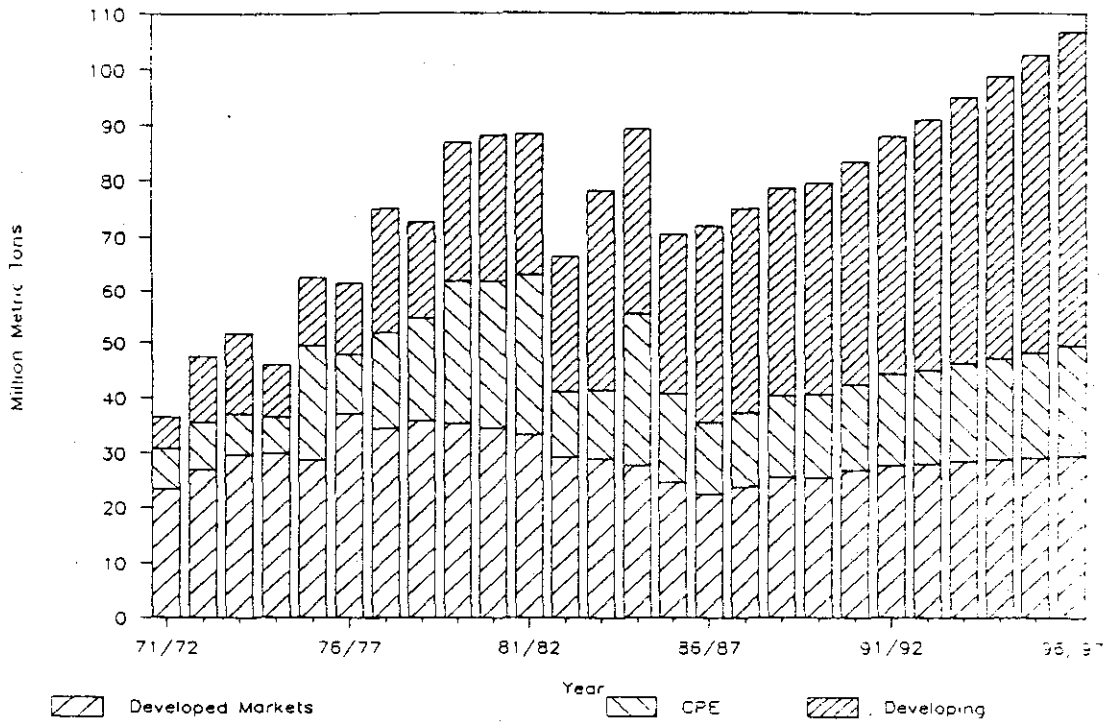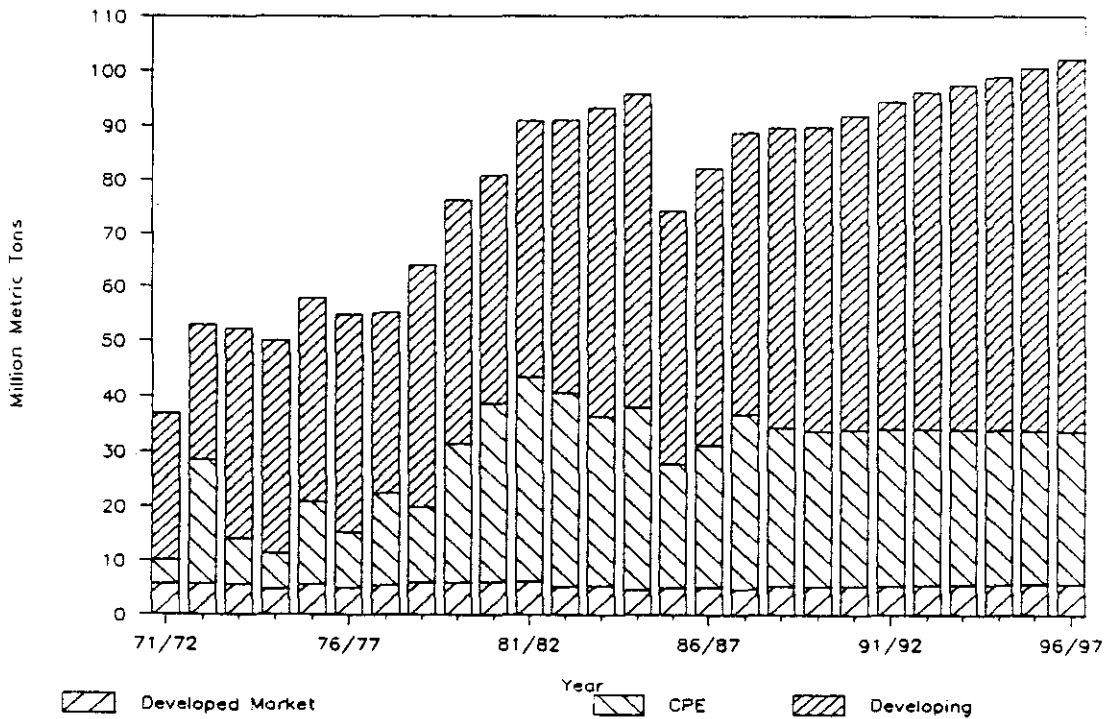## Figure 4:   Net Importers: Coarse Grains Imports

Figure 5:   Net Importers: Wheat Imports

increased quantity and value of soybean meal to the industrial and centrally planned economies.

The supply, demand, and prices in the evaluation period indicate a return to more stable commodity market conditions after the extraordinary market boom of the mid-1970s and the equally traumatic decline of the first half of the 1980s. Much of the explanation for this boom and bust cycle lies in macroeconomic factors external to agriculture; however, it also rests with agricultural policies and productivity changes. Johnson et al. (1988) recently evaluated the sensitivity of these projections to alternatives for macroeconomy, productivity growth, and potential policy changes that could occur over the next decade.

Detailed Regional Implications

This section is a discussion of the results of projecting grain production, consumption, and import requirements of four major regions from 1987/88 to 1996/97 (Africa and the Middle East, Latin America, Asia, and the centrally planned economies).

Africa and Middle East

It is projected that African and Middle Eastern countries' imports of wheat will increase from 27.7 million metric tons in 1987/88 to 34.5 million metric tons in 1996/97. This is due to the widening gap between domestic use and production levels over the projection period (Figure 6). Production grows only at an average annual rate of 1.5 percent, whereas domestic use grows at a much faster rate of 1.9 percent, resulting in increased import needs in the next decade by the countries in this region.
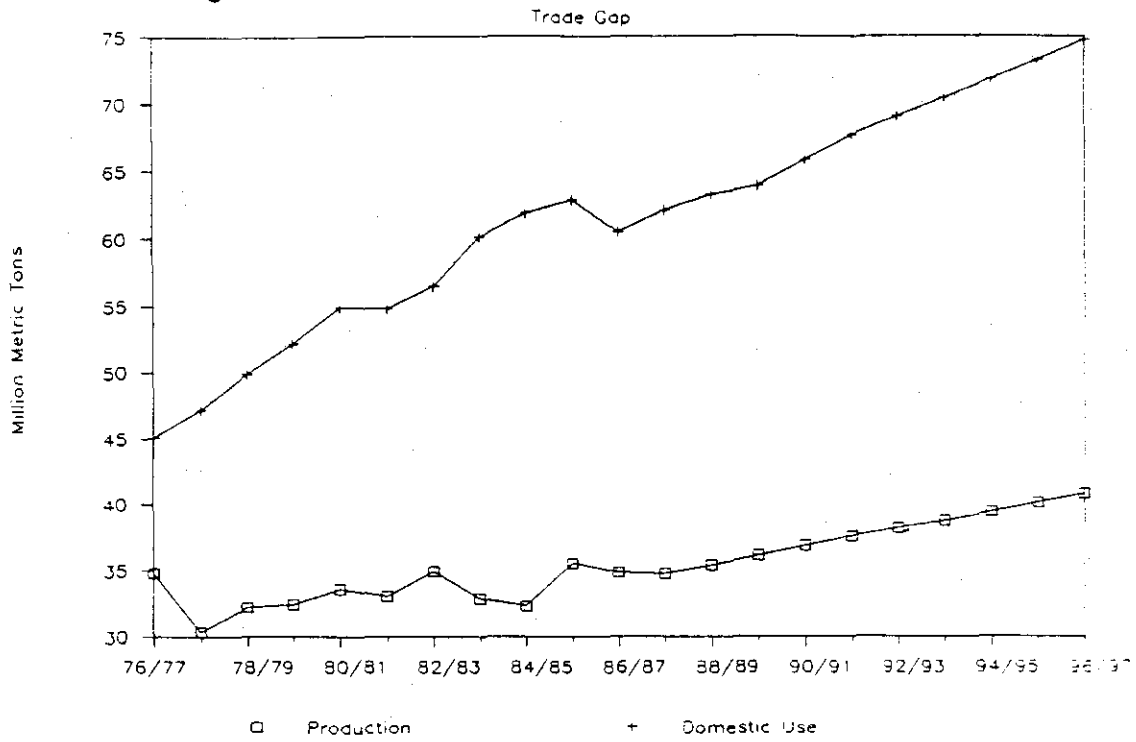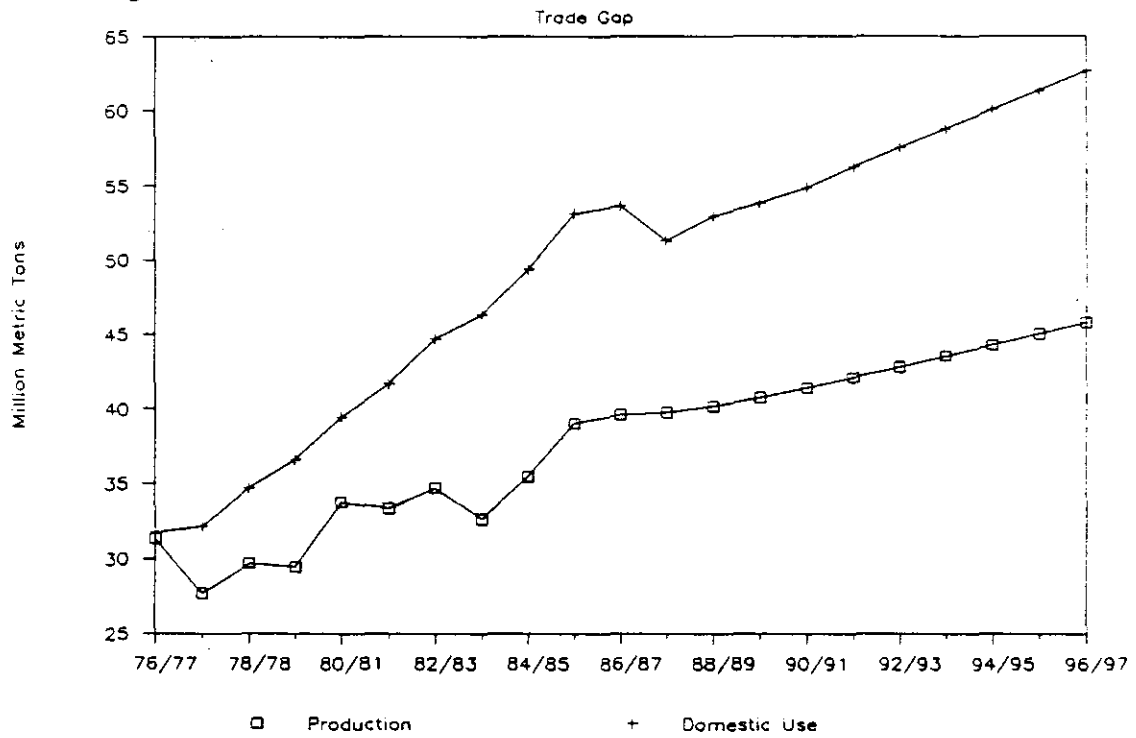
Figure 6:   Africa and Middle East Wheat

Trade Gap

Million Metric Tons

76/77   78/79   80/81   82/83   84/85   86/87   88/89   90/91   92/93   94/95   96/97

□   Production   +   Domestic Use

Figure 7:   Africa and Middle East Coarse Grains

Trade Gap

Million Metric Tons

76/77   78/78   80/81   82/83   84/85   86/87   88/89   90/91   92/93   94/95   96/97

□   Production   +   Domestic Use

A similar projection for coarse grains shows imports increasing from 11.5 million metric tons in 1987/88 to 17.1 million metric tons in 1996/97 (Figure 7). As in the case of wheat, the domestic use growth rate is projected to increase at a faster pace than that of production. These increases in domestic use can be attributed to the projected increases in population throughout the region and income growth rates in certain countries. The projected real GDP growth rate of 3.0 percent over the next decade is significantly higher than the -0.06 percent rate of the previous decade.

In most of the region's countries, domestic production does not meet growing demands. For example, many countries in the Middle East do not have suitable agronomic conditions to produce enough food for the demands generated by population and income growth; indeed, the contribution of the agricultural sector to their GNP is very small.

In most African countries, however, agriculture contributes at least 50 percent of the GNP. The governments of many of these countries tend to subsidize consumption, while imposing taxes on the agriculture sector and food production. Projected population growth rates of the African region exceed food production growth rates. Moreover, the economies in many of its countries are plagued by foreign debt problems. Agriculture is generally characterized by declining per capita income, a slow increase or none at all in per capita food production, recurrent droughts, and unmanageable debt. Therefore, most African countries will be likely to rely on foreign food aid and development assistance in the near future.

One of the countries studied closely in this region is Egypt, because of its growing import demand. For the past two decades, Egypt has not been self-sufficient in food production, currently importing about half of the foods required by its rapidly rising population of more than 50 million people. As shown in Figures 8 and 9, wheat and corn production is virtually stagnant, whereas combined domestic use increases from 14.0 million metric tons to 15.4 million metric tons from 1987/88 to 1996/97. This results in an increase of 2.1 million metric tons of imports over the same period.

Countries such as Algeria and Morocco are expected to make little progress in grain production, despite significant demand growth that would make them more dependent on the world market for their imports. As indicated in Figure 10, four North African countries (Egypt, Algeria, Tunisia, and Morocco) are expected to expand wheat imports by an additional 2 million metric tons by 1996/97.

Expansion of the livestock industry, coupled with import subsidies, has made Saudi Arabia one of the world's largest importers of barley, from less than 0.1 million metric tons in 1976/77 to 8.6 million metric tons in 1986/87 (Figure 11). Future imports are expected to remain high, with relatively little growth.

Latin America

Production and domestic use of wheat and coarse grains in Latin American countries, excluding Argentina, are shown in Figures 12 and 13. Since Argentina is a net exporter of wheat and coarse grains, its
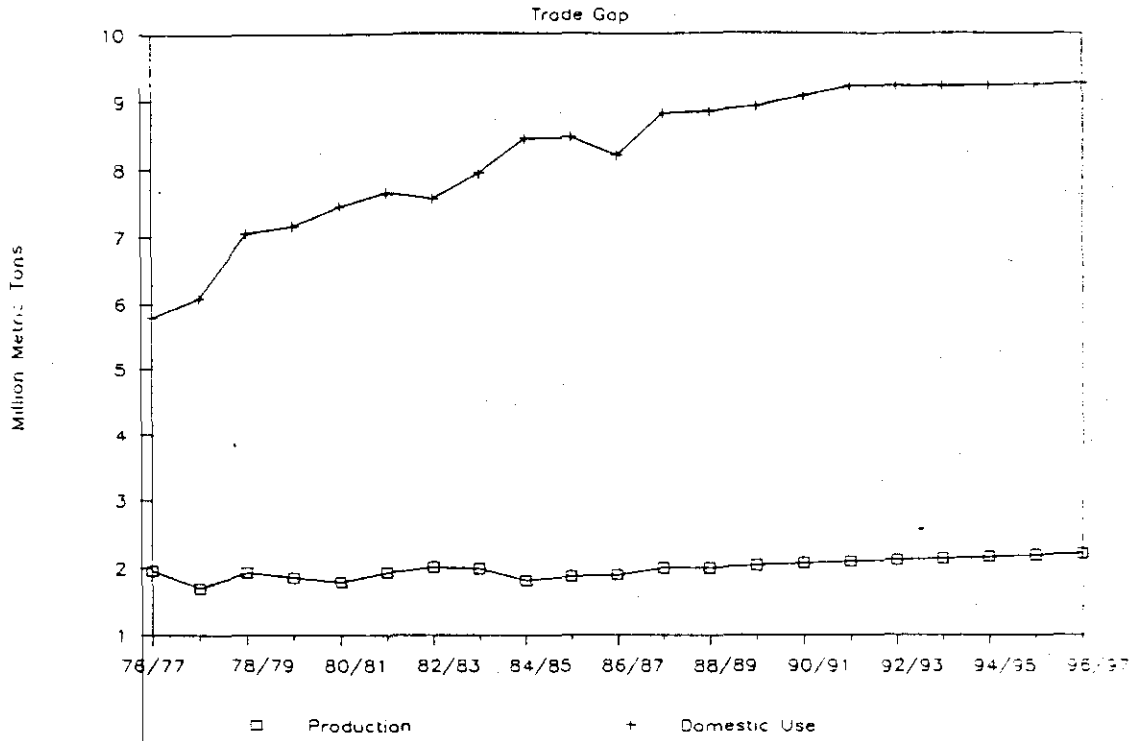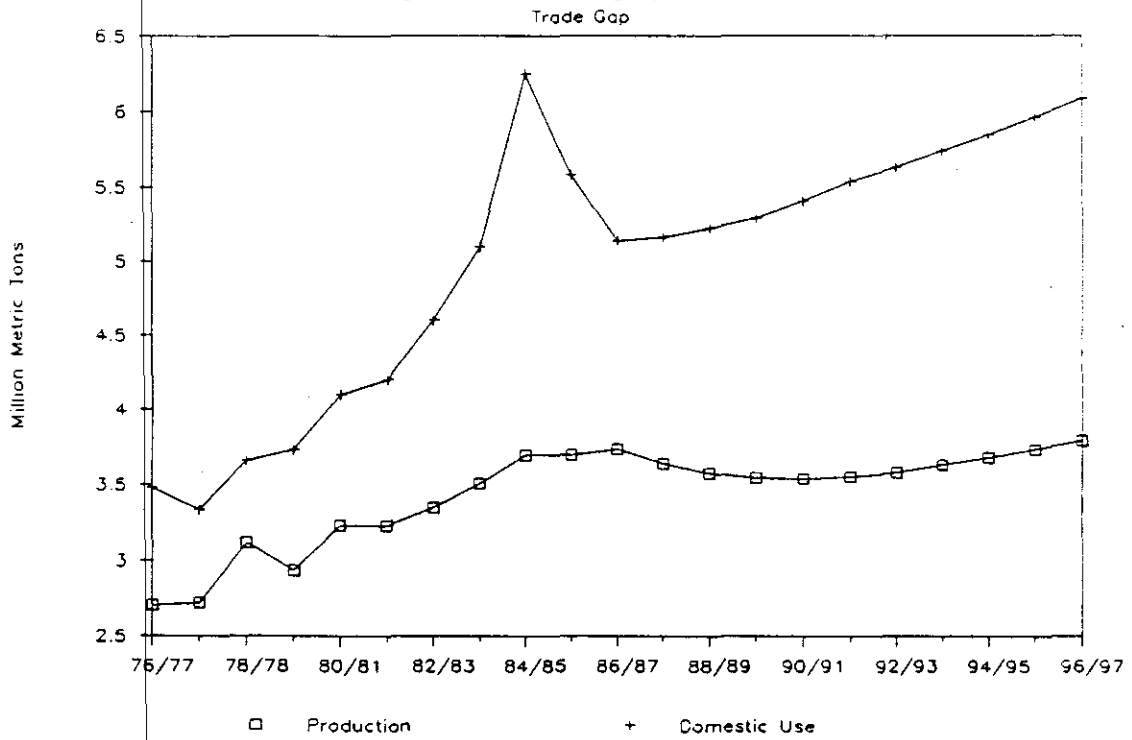
Figure 8: Egypt Wheat
Trade Gap

Million Metric Tons (y-axis)

X-axis: 76/77, 78/79, 80/81, 82/83, 84/85, 86/87, 88/89, 90/91, 92/93, 94/95, 96/97

□ Production + Domestic Use

Figure 9: Egypt Corn
Trade Gap

Million Metric Tons (y-axis)

X-axis: 76/77, 78/78, 80/81, 82/83, 84/85, 86/87, 88/89, 90/91, 92/93, 94/95, 96/97

□ Production + Domestic Use

Figure 10: Egypt, Algeria, Tunisia and Morocco Wheat

Trade Gap

Million Metric Tons

76/77 78/79 80/81 82/83 84/85 86/87 88/89 90/91 92/93 94/95 96/97

□   Production   +   Domestic Use
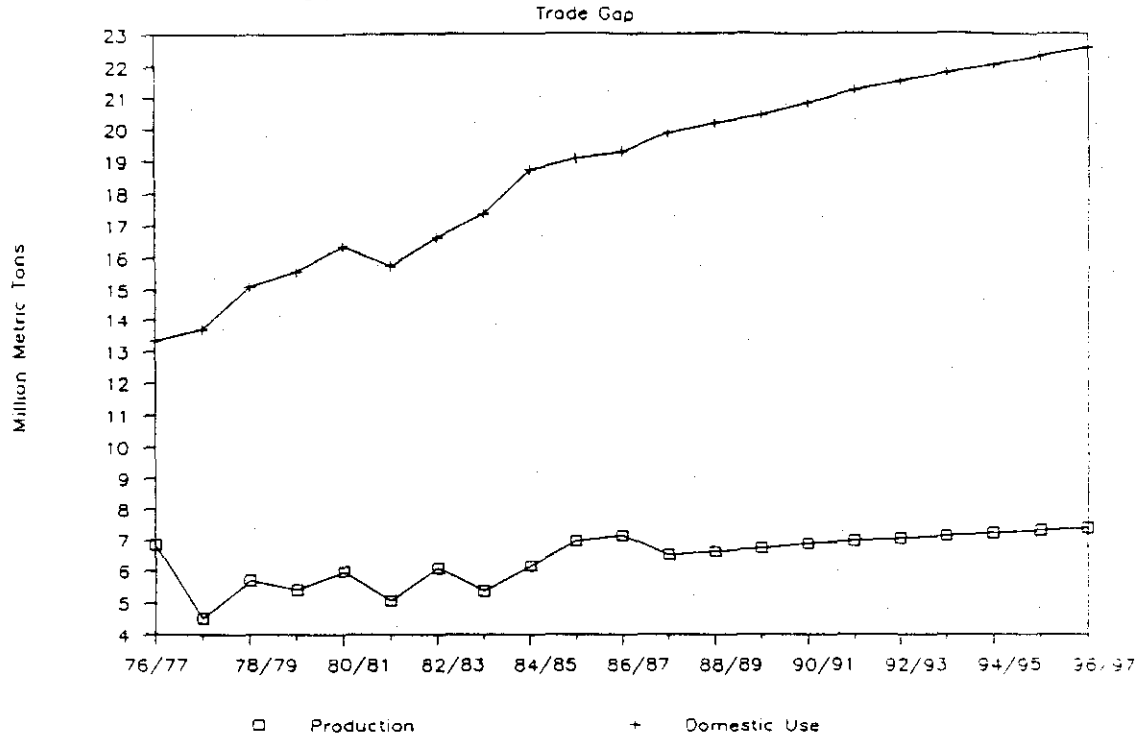
Figure 11: Saudi Arabia Barley

Trade Gap

Million Metric Tons

76/77 78/78 80/81 82/83 84/85 86/87 88/89 90/91 92/93 94/95 96/97

□   Production   +   Domestic Use
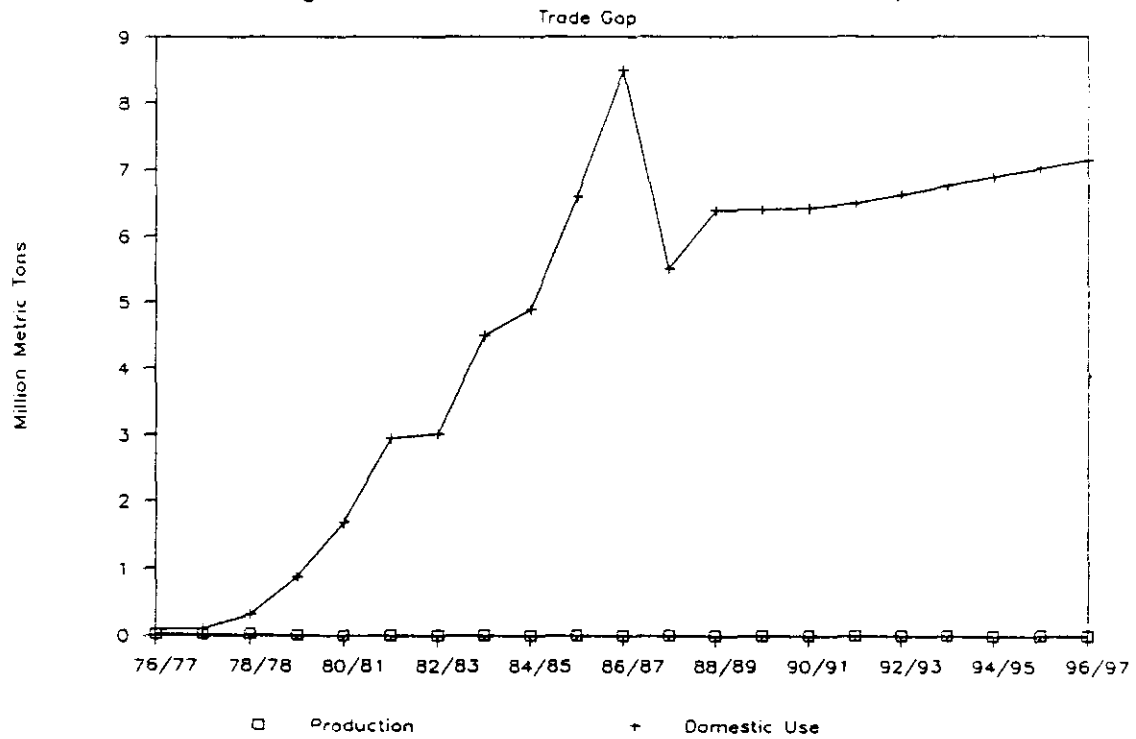
Figure 12: Latin America less Argentina Wheat

Trade Gap
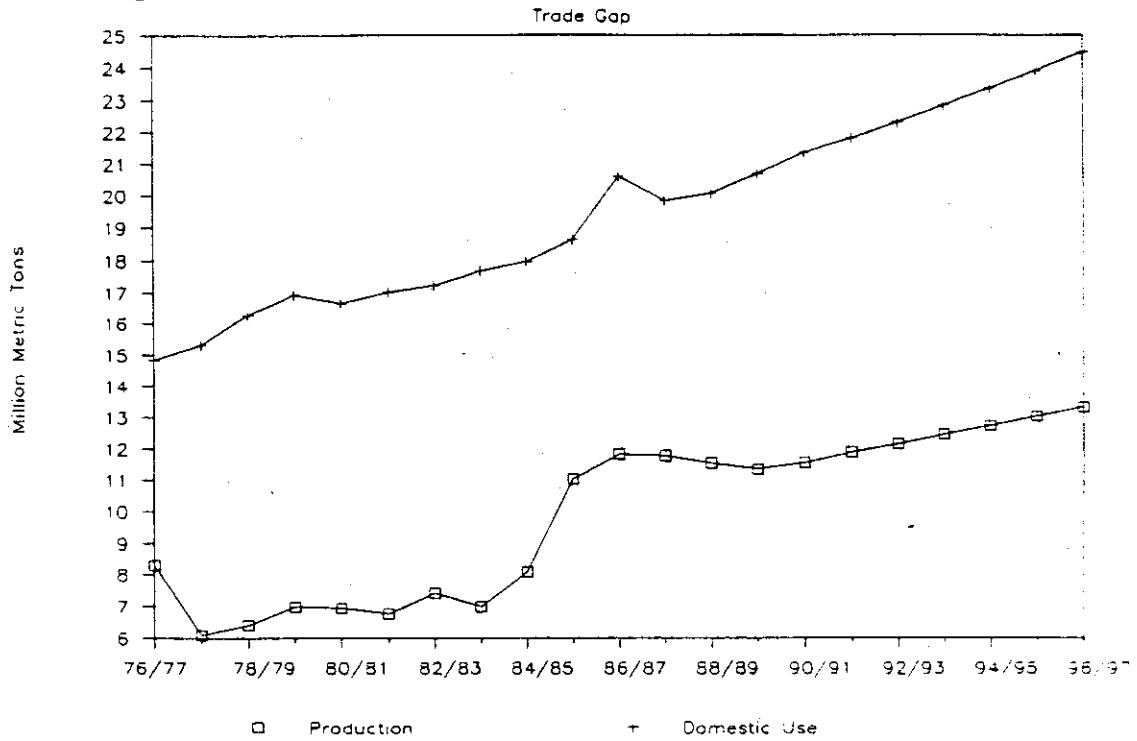
Figure 13: Latin America less Argentina Coarse Grains

Trade Gap
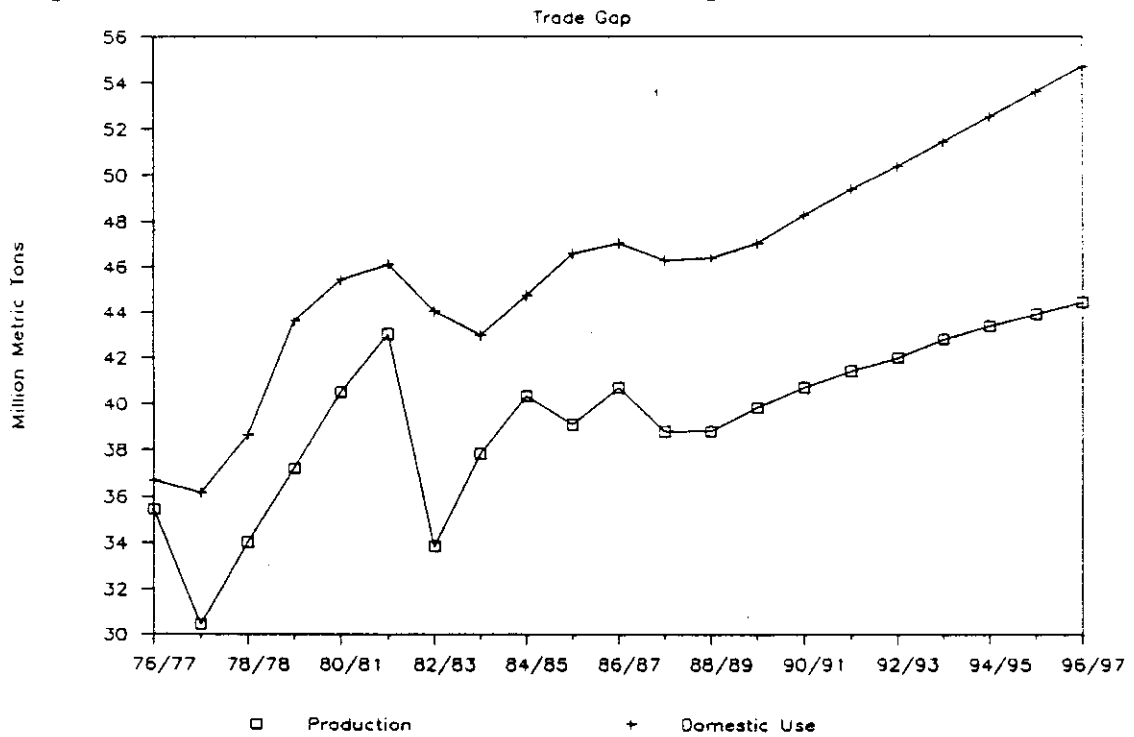
inclusion would lead to the misconception that Latin American countries do

not rely heavily on imports of those commodities. It is evident that more

imports by countries in this region are expected; net imports of wheat in

1987/88 were 8.4 million metric tons, projected to increase by 2.8 million

metric tons to 11.2 by 1996/97. Coarse grain imports over the same period

are expected to go up by 2.9 million metric tons. In both wheat and

coarse grains, growth in domestic use exceeds production growth.

Even though the projected average income of $1,997 per capita for

this region is higher than in many developing countries, economic growth

in many of its countries is slowed by high inflation rates, large foreign

debt, foreign exchange shortages, and unstable economic and political

conditions. Foreign exchange deficits could severely restrict imports of

agricultural commodities.

Brazil's production and domestic use of wheat and coarse grains are

presented in Figures 14 and 15, respectively. In 1987/88 Brazil imported

only 2.2 million metric tons of wheat and 2 million metric tons of coarse

grains. However, its imports over the next decade are projected to grow

significantly, reaching 4.5 million metric tons of wheat and 4.7 million

metric tons of coarse grains in 1996/97. Although Brazil's economic

growth has increased in recent years, its foreign debt of $108 billion,

about one-half of its GDP, remains a major obstacle to its continued

economic growth. Overall, Brazil is an exporter of agricultural products

and relies heavily on its agricultural export revenues for foreign
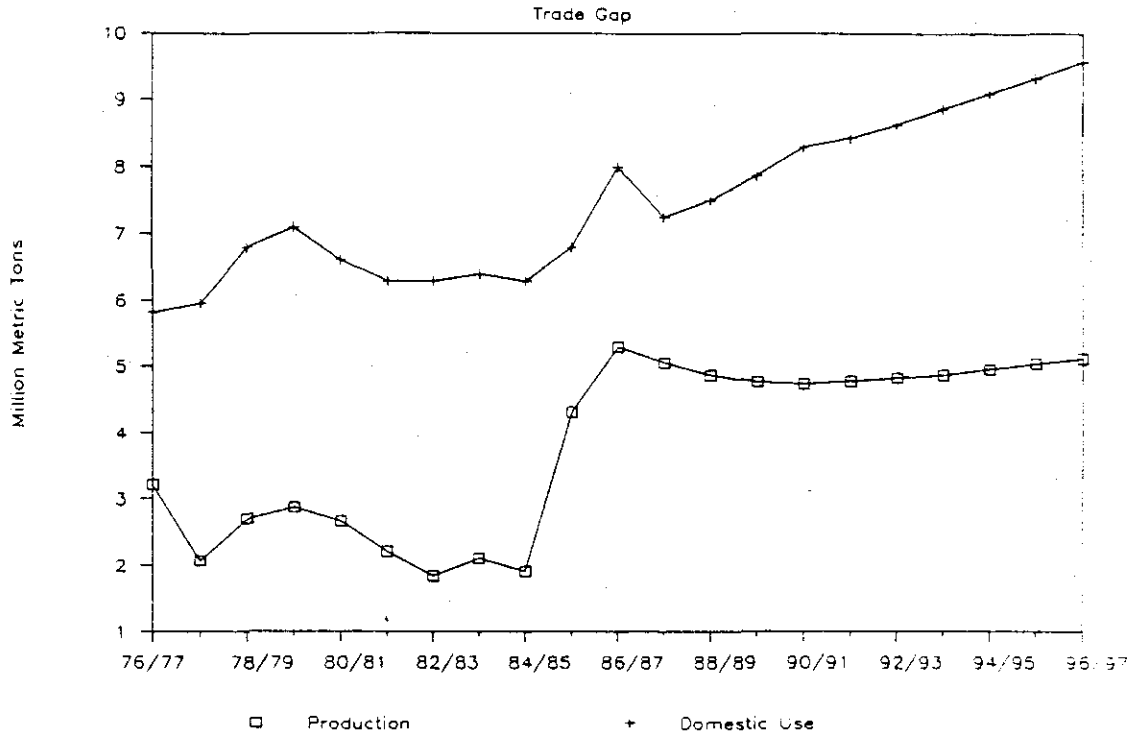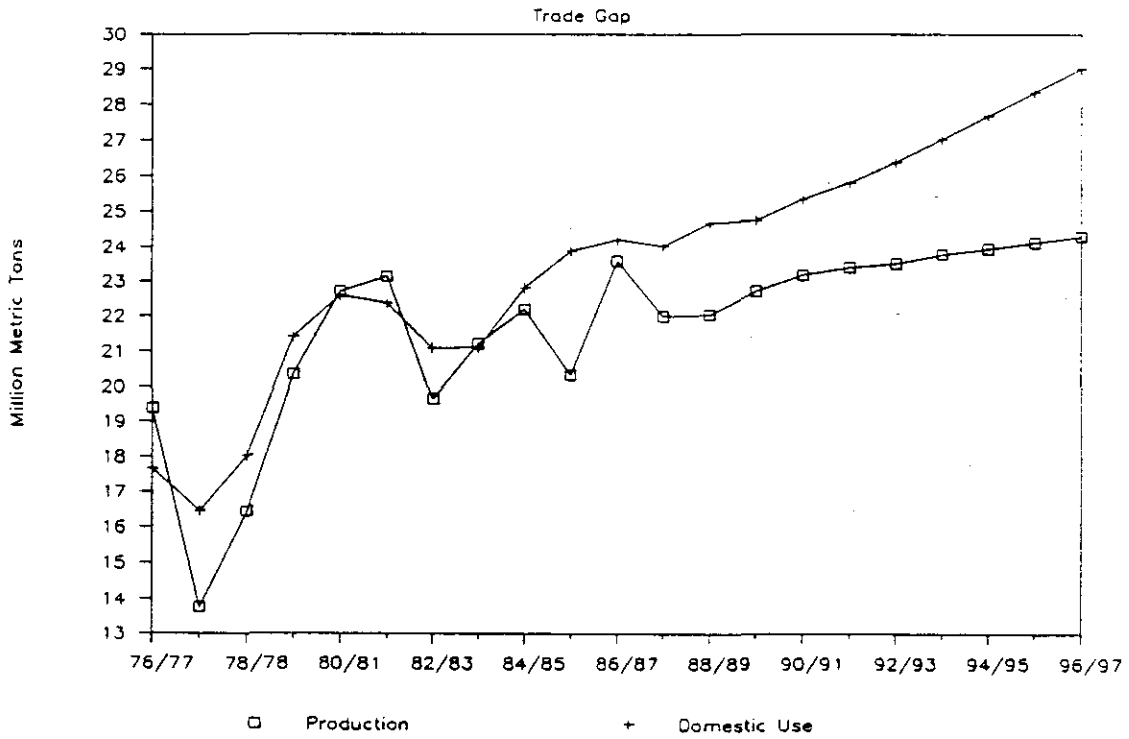
exchange.

Figure 14: Brazil Wheat

Trade Gap

Million Metric Tons

□ Production   + Domestic Use

Figure 15: Brazil Coarse Grains

Trade Gap

Million Metric Tons

□ Production   + Domestic Use

Mexico's production and domestic use of wheat and coarse grains are presented in Figures 16 and 17. Mexico is only a small importer of wheat and is expected to produce enough wheat to keep pace with demand growth. However, Mexico is a moderate importer of coarse grains, with a projected import average of 1.8 million metric tons per year over the next decade. Mexico, like many other Latin American countries, is plagued by foreign debt problems, unstable economic conditions, and an uneven income distribution. Furthermore, since Mexico is an oil exporter, its economic growth is closely tied to oil prices, and its imports are likely to vary because foreign exchange earnings depend heavily on oil and its repayment of the foreign debt.

Asia

The production and domestic use of coarse grains and wheat of all Asian countries are shown in Figures 18 and 19. The coarse grain imports of this region in the past decade averaged 5 million metric tons per year but are projected to increase to an average of 12.2 million metric tons per year over the next decade. The average wheat imports corresponding to these two periods are 21.5 million and 27.5 million metric tons, respectively. Clearly, the projected increase in imports by the countries in this region is due to faster growth in consumption than in production. The faster consumption growth is attributed to the projected increases in population in countries such as India, Pakistan, and Bangladesh, along with rising per capita income in East Asian countries such as South Korea, Taiwan, and Hong Kong.
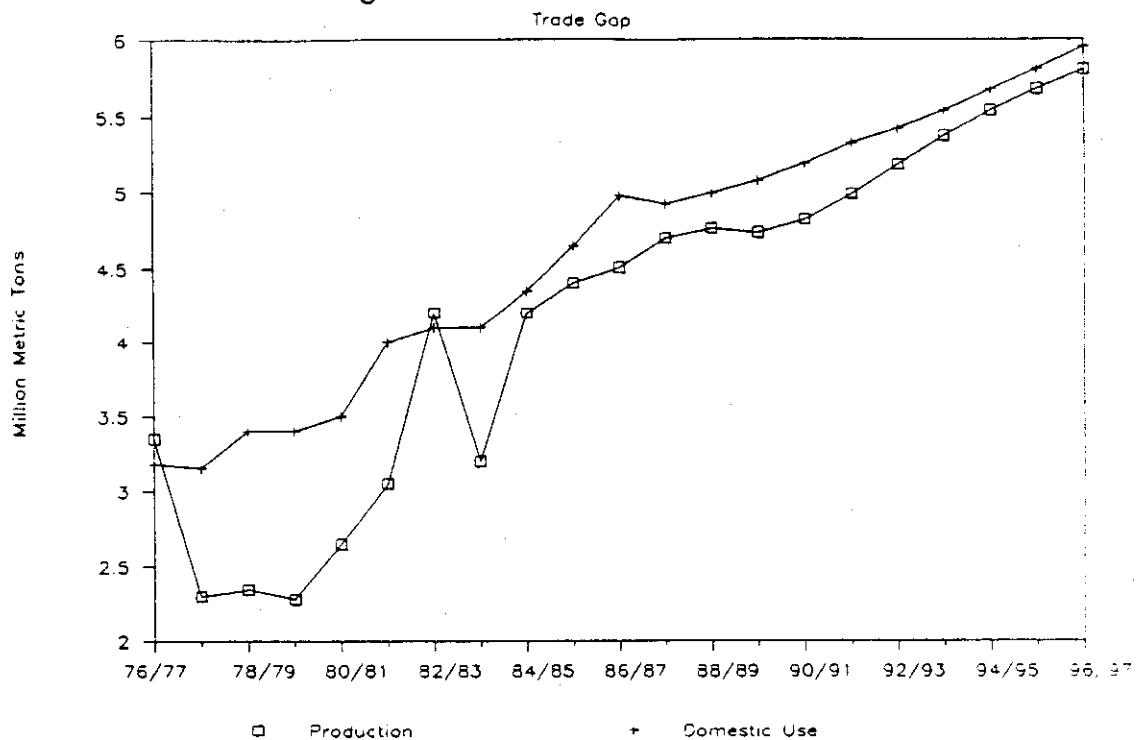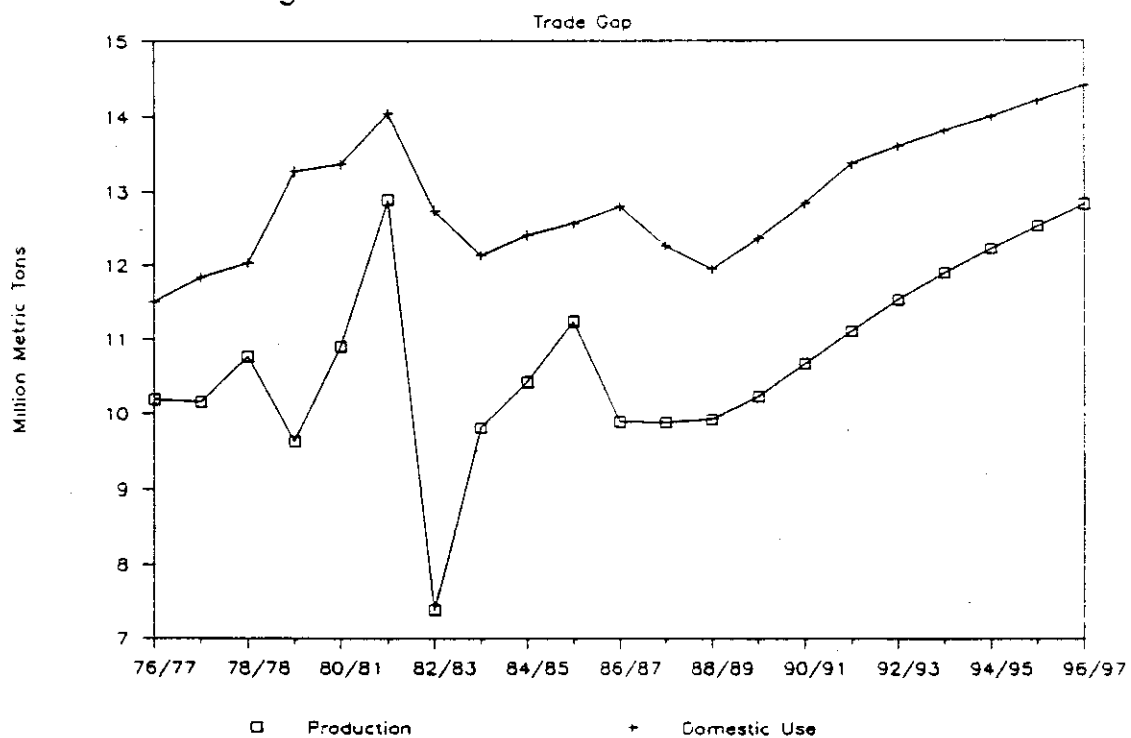
Figure 16: Mexico Wheat

Trade Gap

☐ Production   + Domestic Use

Figure 17: Mexico Coarse Grains

Trade Gap

☐ Production   + Domestic Use

Figure 18:   Asia Wheat

Trade Gap

☐   Production   +   Domestic Use
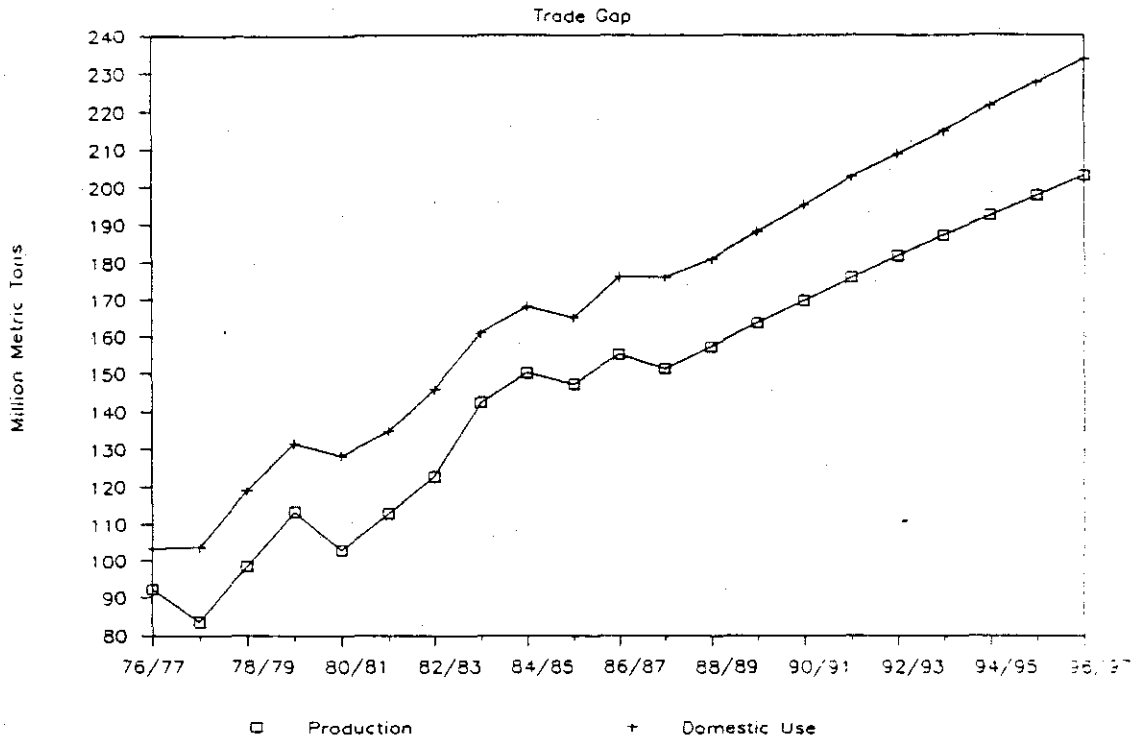
Figure 19:   Asia Coarse Grains

Trade Gap

☐   Production   +   Domestic Use
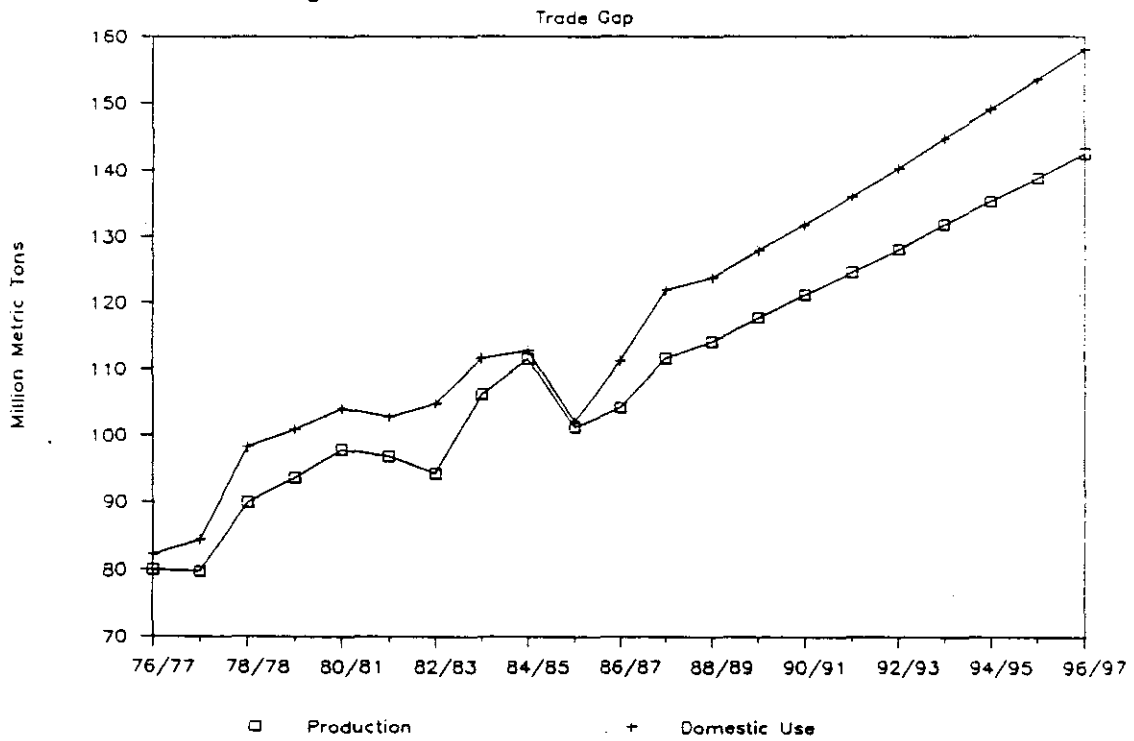
For both wheat and coarse grains, South Korea, Taiwan, Hong Kong, and Singapore, countries in high-income East Asia, show strong import demand (Figures 20 and 21). These countries have made significant advances in the manufacturing sector and experienced high economic growth over the past decade. Because of their ability to earn foreign exchange by exporting industrial goods, it is assumed that these countries will continue their economic progress in the next decade. Recently they have also expanded their livestock sectors, thus making them more dependent on imports of coarse grains and consequently increasing their importance as high growth markets for these products.

China and Thailand are both expected to continue to export corn. Therefore, the production and domestic use projection for this region, excluding China and Thailand, is a better indicator of the growing need for coarse grain imports (Figure 22). Furthermore, since the HIEA countries would not have significant foreign exchange constraints, they are excluded. The average annual imports of coarse grains by the remaining Asian countries over the past three years were nearly two million metric tons and are projected to more than double over the next ten years.

In the case of wheat, India is expected to remain nearly self-sufficient, and the HIEA countries will have no difficulty paying for wheat imports. As shown in Figure 23, wheat imports by other countries in this region, excluding India and HIEA, are projected to increase slowly.
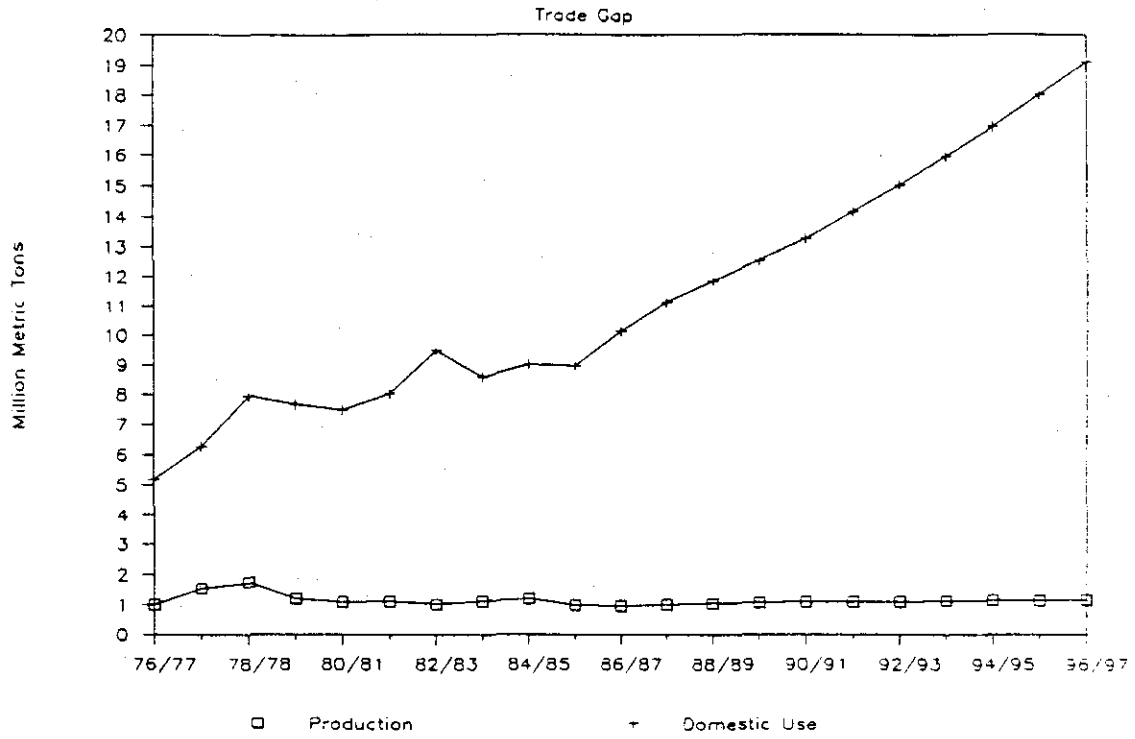
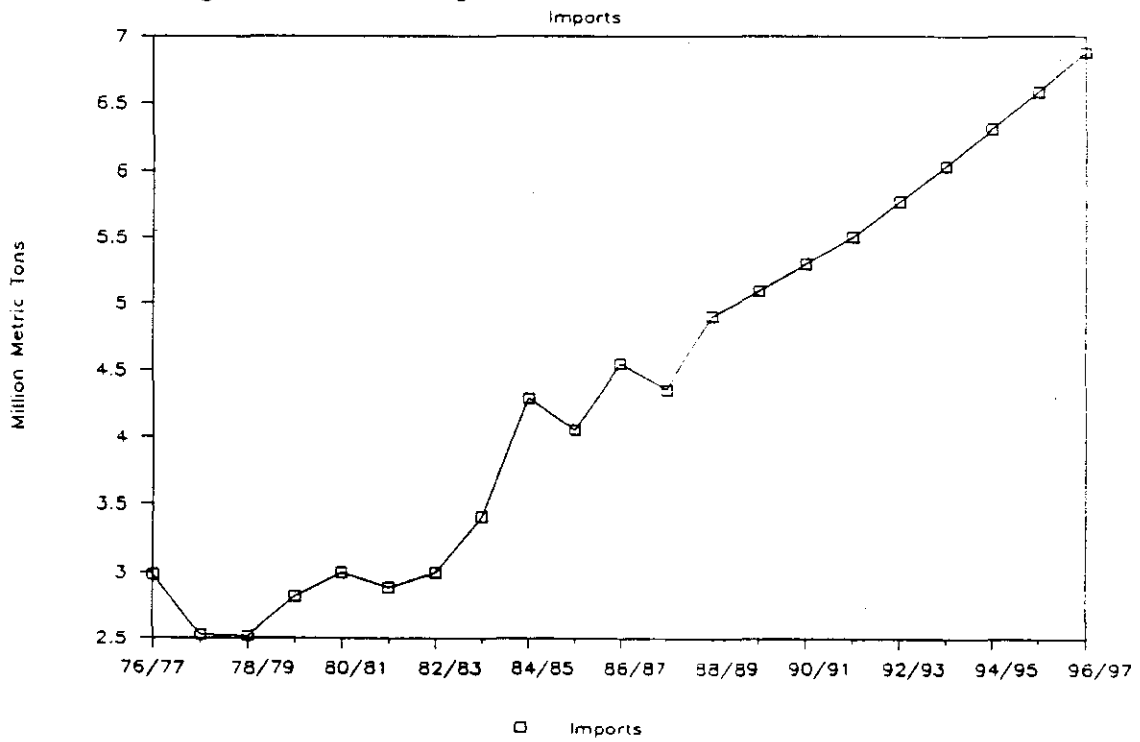# Figure 20:   High Income East Asia Coarse Grains

Trade Gap

□   Production   +   Domestic Use

Figure 21:   High Income East Asia Wheat

Imports

□   Imports

Fig. 22: Asia less China, Thailand, HIEA Coarse Grains

Trade Gap

□ Production   + Domestic Use

Figure 23: Asia less HIEA and India Wheat

Trade Gap

□ Imports   + Domestic Use
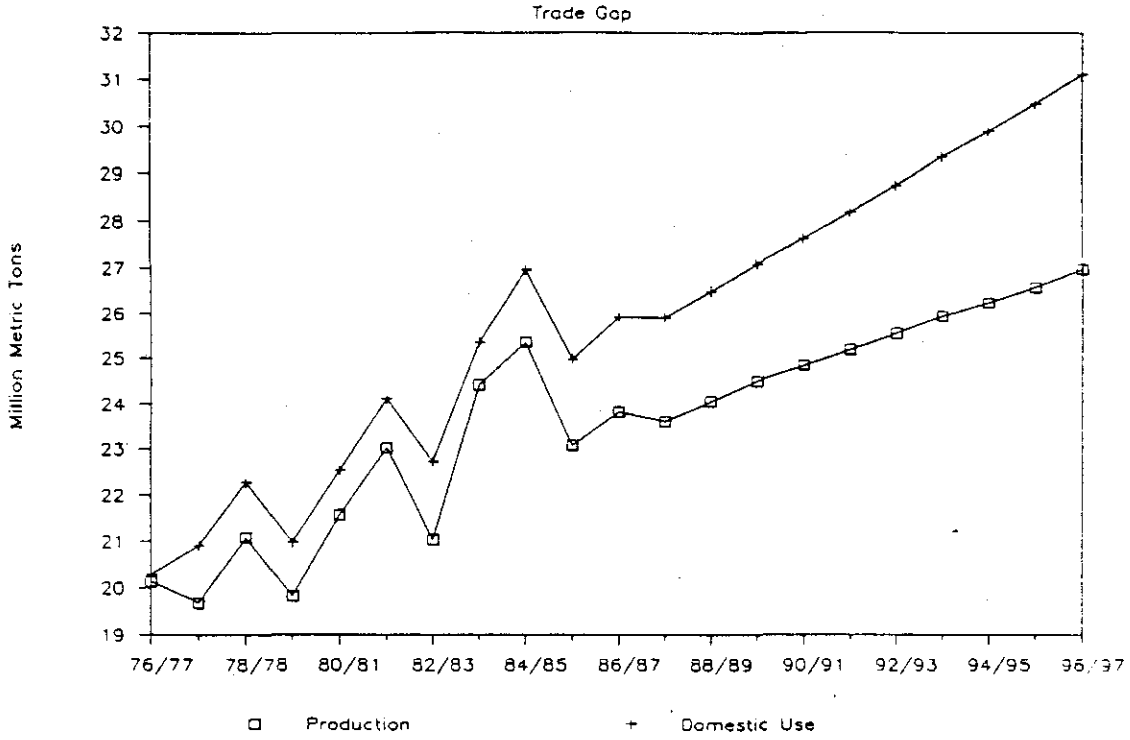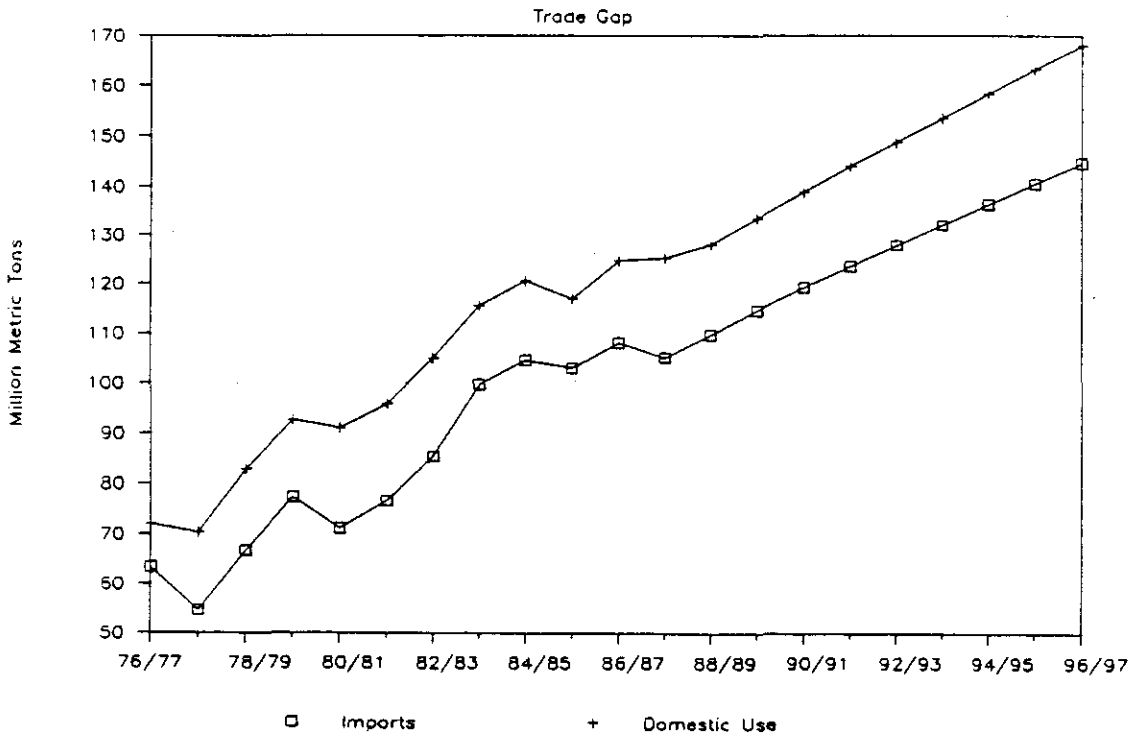
Centrally Planned Economies

The centrally planned economies include the Soviet Union and Eastern Europe. Imports by these countries over the past ten years have fluctuated greatly because they are primarily determined by centralized political decisions and production variability; yet it is expected that their imports of wheat and coarse grains will continue to be significant (Figures 24 and 25). Unfavorable climatic conditions, inefficient input use, and little technological innovation in the past, as well as economic policies favoring industrial sector development, have made these countries more dependent on the world market. However, both production and domestic use of wheat and coarse grains are projected to increase over the next ten years, with annual imports averaging 20.2 million metric tons of wheat and 18.7 million metric tons of coarse grains.

Conclusions and Implications

The implications of these projections can be summarized by looking at per capita income, production, consumption, and net imports of the major developing regions of the world. Per capita income growth rates for the Latin American and Asian regions are slightly lower than for the past decade. In Africa and the Middle East a decline in per capita income is still projected, but at a much slower rate than occurred during the past decade. Overall, the general economic picture for the world is projected to be significantly more favorable than that of the past five years, although not as robust as the 1970s. Thus, the ten-year historical
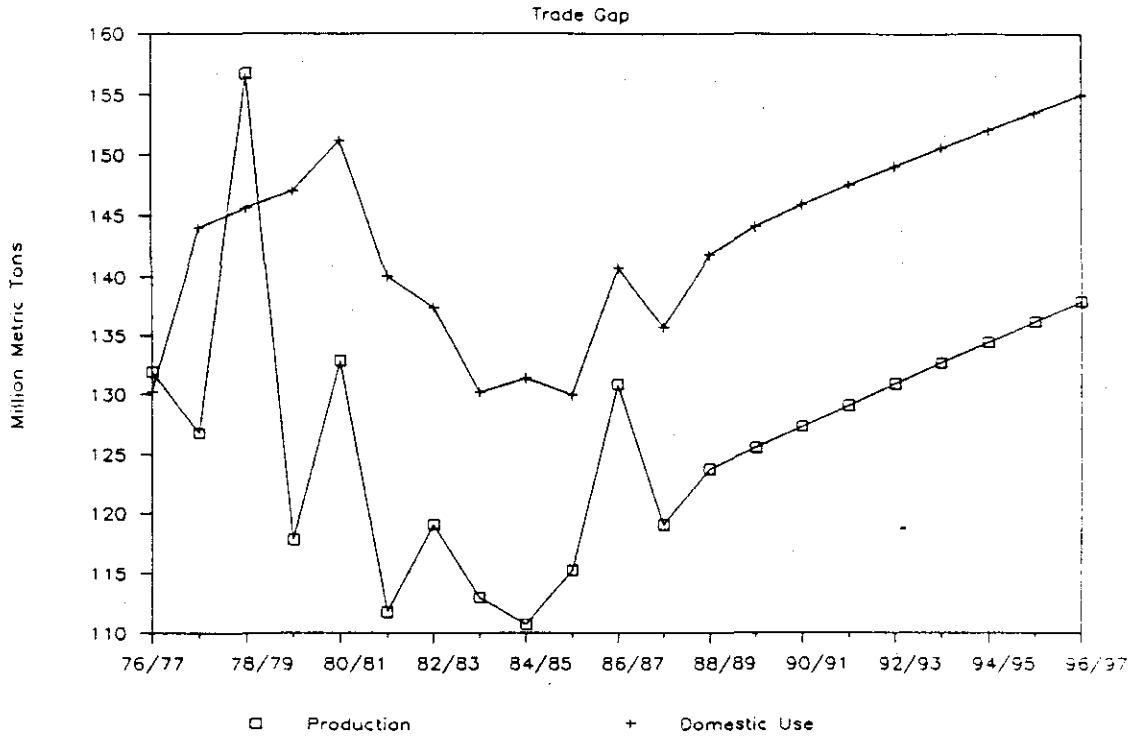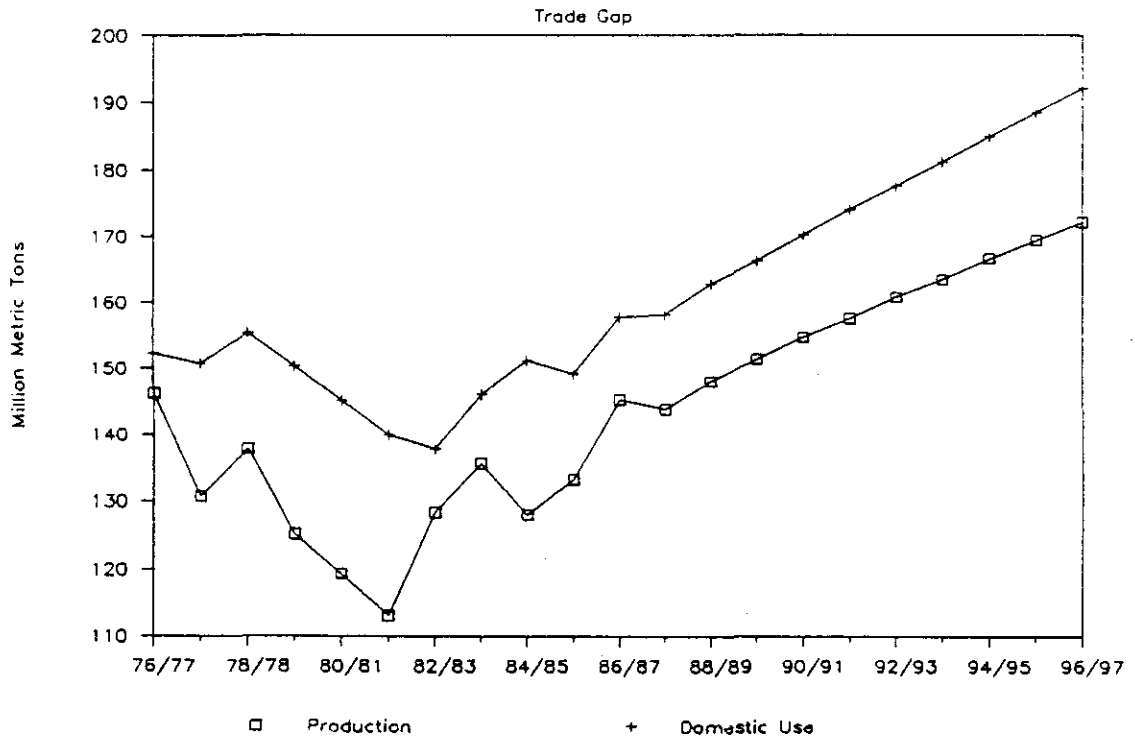
Figure 24: Centrally Planned Economies Wheat

Trade Gap

☐   Production   +   Domestic Use

Figure 25: Centrally Planned Economies Coarse Grains

Trade Gap

☐   Production   +   Domestic Use

averages mask the sharp economic downturn of the early 1980s and the more recent improvement in economic performance of the mid-1980s.

While the improved economic conditions are encouraging, the fact remains that production growth in many developing countries cannot keep pace with the growth in demand resulting from both population and income increases. This leads to increased import demands for both wheat and coarse grains in most developing regions. Some of the strong growth markets, such as HIEA, can cover the increasing cost of grain imports with increasing revenues from their export sales. However, many other countries in the developing world have heavy debt service problems and foreign exchange constraints that inhibit substantial increases in grain imports. Thus, the rate of production and import growth in these projections is not sufficient to maintain current per capita consumption levels.

Although grain prices are stable or declining in real U.S. dollars, the cost to importers will also depend heavily on whether local currencies appreciate or depreciate relative to the U.S. dollar. The countries with shortages of foreign exchange and heavy debt service obligations are the same ones with currencies likely to depreciate relative to the dollar, causing the import costs of needed commodities to increase.

Our analysis suggests that the region under the greatest pressure in terms of potential reductions in per capita consumption is Africa and the Middle East. Second is Latin America, excluding Argentina. Asia is expected to perform better, because production growth is expected to keep pace with or be slightly ahead of the population growth rate. A major

reason for the declining per capita consumption in other regions is that per capita production is declining. Although imports are increasing in all developing regions, these increases are not sufficient to offset the slower rates of growth in production.

Implementing measures for improving productivity growth in these regions would be the most desirable solution to these problems. A recent analysis by Johnson et al. (1988) indicated that improved rates of yield growth globally would benefit the developing regions by reducing world market prices, increasing their production, and reducing their net imports.

Another important measure is the resolution of the Third World debt problem. The debt service burden is one of the constraints on import demand in developing countries. Resolving the debt problem or applying other measures to increase the rate of economic growth in developing countries would be likely to stimulate more import demand for grains and would lead to higher levels of trade.

Food assistance programs are recognized as short-term or stop-gap measures rather than solutions to stagnant or declining per capita consumption levels. Targeted export subsidies can have a similar effect, provided that the targeting is based on human need rather than on geopolitical or policy strategy considerations.

A conclusion of the recent 1988 World Food Conference (Helmuth and Johnson) is that a shift in priorities is needed. Third World countries must have assistance in developing entire infrastructures--education, health care, highways, harbors, marketing, and distribution systems--as

well as developing their agricultural and industrial sectors. Only

through long-term, sustainable growth can the problem of food security be

solved. Only when Third World nations are able to efficiently produce and

sell the products for which they have a comparative advantage, will they

have command of the resources necessary to feed their populations. When

economic development reaches this point, the investment of developed

nations in economic assistance can return benefits to the donors as well

as to the recipients.

References and Documentation

Bahrenian, A., S. Devadoss, and W. H. Meyers. 1986. "FAPRI Trade Model for Feed Grains: Specification, Estimation, and Validation." Center for Agricultural and Rural Development, Iowa State University, Ames, Iowa. Staff Report 86-SR1 (Revised).

Devadoss, S., M. D. Helmar, and W. H. Meyers. 1986. "FAPRI Trade Model for the Wheat Sector: Specification, Estimation, and Validation." Center for Agricultural and Rural Development, Iowa State University, Ames, Iowa. Staff Report 86-SR3 (Revised).

"FAPRI Ten-Year International Agricultural Outlook." 1988. Food and Agricultural Policy Research Institute, University of Missouri-Columbia and Iowa State University. FAPRI Staff Report #1-88.

Helmuth, J. W., and S. R. Johnson, editors. 1988 World Food Conference Proceedings Volume II: Policy Addresses and Recommendations. Iowa State University Press, Ames, Iowa. Forthcoming.

Johnson, S. R., William H. Meyers, Patrick Westhoff, and Abner Womack. 1988. "Agricultural Market Outlook and Sensitivity to Macroeconomic, Productivity, and Policy Changes." Paper prepared for the Twentieth International Conference of Agricultural Economists, Buenos Aires, Argentina, August 23-31, 1988.

Meyers, W. H., S. Devadoss, and M. D. Helmar. 1987. "Agricultural Trade Liberalization: Cross-Commodity and Cross-Country Impact Products." Journal of Policy Modeling 9(3):455-82.

Meyers, W. H., M. D. Helmar, and S. Devadoss. 1986. "FAPRI Trade Model for the Soybean Sector: Specification, Estimation, and Validation." Center for Agricultural and Rural Development, Iowa State University, Ames, Iowa. Staff Report 86-SR2 (Revised).

"World Economic Outlook." 1987. The WEFA Group, Bala Cynwyd, Pennsylvania.