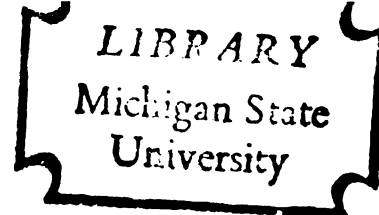


EFFECTS OF THE EUROPEAN ECONOMIC
COMMUNITY AGRICULTURAL
POLICIES ON ARGENTINE
EXPORTS OF BEEF

Thesis for the Degree of Ph. D.
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ERNESTO S. LIBOREIRO
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THESIS



This is to certify that the
thesis entitled

Effects of the European Community Agricultural
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of the requirements for

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ABSTRACT

EFFECTS OF THE EUROPEAN ECONOMIC COMMUNITY AGRICULTURAL POLICIES ON ARGENTINE EXPORTS OF BEEF

By

Ernesto S. Liboreiro

Implementing the agricultural policies common to all countries the EEC is expected to produce changes important in its structure of prices, production, and marketing. Since this economic block constitutes a large outlet for Argentine beef exports and there are indications that the importance of this market could increase or decrease, it is relevant to determine the direction and magnitude of the changes.

The most important objectives of the study are:

1. To build a model that closely represents the location of beef production, consumption, price, and trade patterns in the 1966 base period for the EEC, Argentina, the United Kingdom, the United States, Australia, and other countries.
2. To utilize the model in estimating Argentine beef exports to 1975 under several alternative EEC agricultural

policies, including the possibility of the United Kingdom's entrance into the Common Market.

The core of the research lies in formulating a static, partial equilibrium model. Data requirements are estimates of excess demand functions for each of the world regions considered, the determination of the policy instruments most likely to be used, the value of other parameters such as levels of income, competitive commodity prices, and transfer costs to 1975. A test was made for 1966 and the results, under "most likely conditions," allowed for a quantification of the EEC market. Changes in the value of the parameters permitted an evaluation of their effects upon the solutions of the Basic Run.

Finally, data which constituted the linear constraints of the quadratic model were obtained and discussed on the basis of various sources, and a quadratic formulation developed by Dr. Richard G. Heifner was used to find solutions to the alternatives analyzed.

The main conclusion of the study is that Argentina faces favorable prospects for increasing her beef exports to the Community by 1975. Her main limitation may be the capability to increase slaughtering substantially. The suggested slaughter target of 3,000,000 Tm. would allow for approximately 464,000 and 810,000 Tm. of exports to the EEC and total exports respectively to 1975.

Argentina should continue efforts to encourage the EEC to keep orientation prices of the Common Market from increasing at rates higher than one percent per year in real terms.

It would be highly desirable for Argentina to obtain a preferential trade agreement with the EEC such as a reduction of import duties. But equally important would be trade agreements that allow for regular exports.

The entrance of the United Kingdom, Ireland, and Denmark in the EEC would be favorable for Argentina if the growth rates of the EEC countries are increased by their entry.

Argentina should devote considerable efforts to exporting chilled and frozen beef to the United States. Attention should be given to the possibility of an agreement with the U. S. by which Argentina would guarantee a zone free of foot and mouth disease and the U. S. allow beef imports from this region. An increase in United States quota imports from Australia, New Zealand, Ireland, and Mexico is also in Argentina's interest avoiding trade diversion from the U. S. market towards Europe.

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APPENDIX A

Abbreviations

US\$	=	United States dollar
m\$n	=	Argentine peso
beef	=	beef and veal
CAP	=	Common Agricultural Policy
n.a.	=	not available
th.	=	thousand
Tm.	=	Metric ton
e.c.w.	=	equivalent carcass weight
e.c.w.t.	=	equivalent carcass weight terms
. .	=	zero
Germany	=	West Germany

CHAPTER I

INTRODUCTION

The Treaty of Rome, signed in 1957 by representatives of Belgium, France, Germany, Italy, Luxembourg, and Netherlands, gave origin to the European Economic Community, also known as the Common Market, the Six, the Community, and the EEC. The overall aim of this organization is to provide coordination of economic and social policies allowing a more vigorous and balanced economic development. This coordination included the gradual elimination of tariffs and non-tariff barriers to trade within the area, the adoption of a common commercial policy towards non-member countries,¹ a common transportation policy, free mobility of production factors and a common agricultural policy.

It was argued that the agricultural sector was so important to these countries that specific provisions should be designed for it. This element and the complexity of the sector required a separate common agricultural policy with achievement of higher agricultural productivity, market stabilization, regular supplies and availability of goods to consumers at reasonable prices

¹And more particularly, the use of identical tariffs in each of the six countries.

as its explicit objectives. Implementation of this agricultural policy was to be financed through the European Agricultural Guidance and Guarantee Fund (EAGGF) and the administration facilitated by the elaboration of different and separate regulations for the most important products, taking into account the particularities of each.

Although the Community would not be fully operational until 1970 because a transitional period was allowed for a gradual harmonization of policies, the creation of the Community created serious concerns in several countries from its very inception. Despite the interest of many nations (particularly Western countries) in the creation and development of a successful Community for economic and political reasons, concern grew because of some possible negative effects. The undesirable effects of trade diversion with respect to non-member countries became a factor of serious analysis. As time went on doubts increased. Contradictory statements grew as EEC officials manifested their "good intentions" on one hand, and their adoption of opposing policies on the other.

Countries having strong trade relations with the Six were mainly affected, and Argentina was one of these countries. Table 1 shows that the value of Argentine exports to the EEC represented 41.5% of total exports in 1967, that the EEC was the most important area for Argentine exports in 1967 and that exports to the EEC

TABLE I-1.--Argentine Exports: F.O.B. values and percentages by main areas of destination, 1953-1967 (Thousand of Current US\$).

Area	1953	1954	1955	1956	1957	1958	1959
LAFTA	235.1 20.90	172.8 16.83	190.0 20.46	112.4 11.91	134.0 13.75	118.7 11.94	137.6 13.64
EEC	229.1 20.36	305.0 29.71	221.5 23.85	340.5 36.08	356.4 36.56	330.5 33.26	376.4 37.31
EFTA	289.4 25.72	252.5 24.60	241.6 26.02	243.4 25.80	274.0 28.11	269.3 27.10	261.2 25.89
OTHERS	371.5 33.02	269.4 26.26	275.5 29.67	247.4 26.21	210.4 21.58	275.4 27.71	233.8 23.17
TOTAL	1,125.1 100	1,026.6 100	928.6 100	943.7 100	974.8 100	993.9 100	1,008.0 100

Area	1960	1961	1962	1963	1964	1965	1966	1967
LAFTA	162.4 15.05	100.0 10.37	141.3 11.62	184.7 13.53	234.1 16.60	246.0 18.17	254.1 15.94	284.0 19.19
EEC	418.6 38.79	400.0 41.47	548.4 45.10	569.7 41.73	614.3 43.56	603.7 42.13	608.8 38.21	608.2 41.53
EFTA	254.6 23.59	200.0 20.70	235.8 19.39	235.7 17.27	195.2 13.84	190.2 13.27	186.9 11.73	173.9 11.87
OTHERS	243.6 22.57	254.8 27.46	290.5 23.89	375.0 27.47	367.0 26.00	393.0 27.43	543.5 34.12	398.5 27.21
TOTAL	1,079.2 100	964.1 100	1,216.0 100	1,365.0 100	1,410.3 100	1,432.9 100	1,593.2 100	1,464.5 100

Sources: Conade, Distribución del Ingreso en la República Argentina, Cuadro 22, p. 22, and Dirección Nacional de Estadística y Censos, Comercio Exterior, several issues.

have been increased in both absolute and relative terms. The value of exports to the EEC in 1967 was 265% of the 1953 level, and doubled in percentage terms over the same period.

It was clear by 1967 that the most important and likely risk for the Argentine economy resulting from EEC decisions were concerned with exports of beef and veal. Information was conflicting. On one hand, substantial increases were projected for the future demands for beef and veal to the Common Market,¹ and on the other hand, a dim outlook suggested increasing levels of protectionism and sharp drops in the level of exports. Since this research deals with the effects of the EEC agricultural policies upon Argentine exports of beef and veal,² trade in these products will be surveyed in Chapter III.

(Argentina did export 146,300 Tm. [product weight] of beef to the Six in 1967, which represented 38.4% of the total exports of chilled and frozen beef.) The Common Market constitutes an important outlet for Argentine beef exports. Because there are indications that the importance of this market could either increase or decrease, it is particularly important that Argentina's production

¹Although projections of the future total demand for beef and veal of EEC differ, and some of them very radically, most of them agree in predicting "substantial" increases.

²The word beef will be used in this thesis to denote beef and veal.

and trade policies determine the direction and approximate magnitude of these changes.

The objectives of the study are as follows:

1. To build a model that represents, as closely as possible, the location of production, consumption, prices, and trade pattern of beef in the base period, 1966, for the Six, Argentina, the United Kingdom, the United States, Australia, New Zealand, Ireland, Denmark, the rest of Latin America, Canada, and the rest of the world.
2. To utilize the model in estimating Argentine beef exports to 1975 under "most likely conditions," taking into account EEC policy decisions.
3. To utilize the model in estimating probable changes in the location of production, consumption, prices, and trade patterns resulting from possible changes in the agricultural policies of the Community.
4. To utilize the model in estimating probable changes in the location of production, consumption, prices, and trade patterns resulting from the possible incorporation of the United Kingdom, Ireland, and Denmark into the EEC.
5. To utilize the model in estimating possible changes with respect to the results obtained in 2, in the location of production, consumption,

prices, and trade patterns resulting from modifications of the parameters of the excess demand equations or the policy instruments other than those of the EEC.

The core of the research lies in formulating a static, partial equilibrium model. The requirements for an operational model are estimations of excess demand functions for each of the regions into which the world is divided, the determination of the policy instruments most likely to be used during 1975, and the value of other parameters for the same year such as levels of income, prices of commodities competitive on the demand side, and transfer costs. A test was made for 1966 and the results on the basis of "most likely conditions" for 1975 will allow for an approximate quantification of the EEC Market. Changes in the value of the parameters will permit the determination of changes in the solution with respect to the base solution for 1975 and a knowledge about the sensitivity of the model to changes in some of its parameters.

Ordinary least squares were used to estimate the demand functions for the 9 most important countries in the model, while point estimations were used for the quantities demanded by the remaining 6 regions and for the quantities to be slaughtered in all the regions by 1975. The excess demand functions for each of the 15 regions were obtained

by subtracting the supply estimates from the demand functions.

Finally, data which constituted the linear constraints of the quadratic model were obtained and elaborated on the basis of various sources and a quadratic formulation developed by Dr. Richard G. Heifner was used to find the solutions to the various alternatives analyzed.

CHAPTER II

BEEF AND VEAL POLICY OF THE EUROPEAN ECONOMIC COMMUNITY

The Common Agricultural Policy

National policies of the present EEC countries were partly developed during the 1930s to offset cheaper foreign sources of supply and were continued during the World War II and early postwar period to avoid war induced shortages and to overcome foreign exchange shortages.¹ Although the objectives of the agricultural policies followed by the six countries were very similar,² the economic, political, and social conditions led to different organization in their economies and to the use of very different instruments to implement their particular agricultural policies. In 1957 the Treaty of Rome³ introduced a unifying element in some of the economic policies of these countries and

¹Dale Hathaway and Vernon Sorenson, The Grain-Livestock Economy and Trade Patterns of the European Economic Community, Research Report No. 5 of Institute of International Agriculture, Michigan State University, 1968, p. 19.

²Organization for Economic Cooperation and Development, Agricultural Policies in 1966, OECD Publication, France, 1967, p. 10.

³Treaty Establishing the European Economic Community and Connected Documents (an unofficial English translation). Published by the Secretariat of the Interin Committee for the Common Market and Euraton, Brussels.

particularly in their agricultural policies. They were expected to adjust their policies during a transitional period,¹ until a common agricultural policy, mainly based on common prices, could operate throughout the community. By mid-1967, 90% of the agricultural production was included under the various CAP regulations.

These objectives became less important, however, and were replaced by others, such as income level protection for farmers and the stability of the markets for agricultural products. The main objectives according to the Treaty of Rome are:

1. to increase the productivity of agriculture through the development of the agricultural technologies, securing a rational development of its production and optimal use of the factors of production, particularly labor;
2. to guarantee a fair standard of living for the agricultural population, especially through increasing individual incomes of those people employed in agriculture;
3. to stabilize the markets;
4. to guarantee regular supplies;
5. to guarantee reasonable prices for consumers.

¹This period began in July, 1962, for some commodities and by 1962 the main regulations had been prepared for beef and dairy products as well.

In practice, some of these objectives oppose each other and originate conflicts which must be solved by political compromise. An example is the compromise necessary between guaranteeing a fair level of living for the agricultural population and obtaining reasonable prices to the consumers. Similarly, price increases at the producer level often negate policies that attempt increases in productivity.

Framework of the CAP

The six countries adopted an economic form of integration known as a common market. This organization requires that a group of countries liberalize trade among them (free trade area) and adopt a common external tariff (customs union) and free factor movements. The first two features of the EEC policy will be surveyed in the following paragraphs. References will be made to the agricultural aspects of these characteristics.

The first move consisted of eliminating trade restrictions on farm products between member countries, following a gradual process of reductions throughout the transition period which ended on July 1, 1968. The elimination that included not only tariffs but also levies that were used among the Six during the transition period, happened 18 months ahead of the Rome Treaty schedule. Some barriers still exist, however, and only in time will they disappear.

The second aspect refers to the adoption of a common trade policy for third countries. An important element here was the adoption, also by July 1, 1968, of a common external tariff (CET). But this is only one example, although an important one, of the common trade policy. Other examples are the common policy for exporting certain products and the application of variable levies.

Beef Regulations of the EEC Market

Since the price levels and market organization to be reached under free trade conditions were not satisfactory to the governing bodies and farmers of the Community in view of the objective to achieve "fair standards of living for the agricultural population," the Council of Ministers approved a set of regulations for a number of agricultural commodities. Each of the regulations covers basic organizational aspects of the markets for each agricultural product in question. The attention here is on those affecting beef.

Two main regulations have been enforced up to this point. The first was Regulation 14 which became effective during the fall of 1964 and lasted until July, 1968, when Regulation 805 replaced it. Both of these regulations define three domestic prices: a guide or orientation price, an intervention price, and a market or reference price. The first is a desirable goal, but is not guaranteed, since it is an average price judged as

satisfactory in a normal year. Guide prices are established annually by the Council of Ministers upon recommendation by the Commission before each agricultural year. Two guide prices are established each year: one for adult cattle and another for calves, and despite the fact that they are not guaranteed, some effort is made to keep market prices close to them.

One tool used to keep market prices close to guide prices is the variable levy, which could be roughly defined as the difference between the guide price and the import price. The objective of variable levies is to reduce imports when internal market prices are low, and vice versa. Upon closer look, however, it becomes apparent that not only the calculation, but also the application of variable levies or prelevements is a complex business. To begin with the mechanism of both the calculation and the application changed from Regulation 14/64 to Regulation 805-68. The calculation for imports of adult cattle or calves during the use of 14/64 followed this formula:

$$VL = GP - (IP + ID)$$

where:

VL = Basic Variable Levy, that is variable levy per liveweight Tm.

GP = Guide Price per liveweight Tm.

IP = Import Price calculated on the basis of prices which are supposedly representative of Denmark, England and Wales, Austria and Ireland. The simple average of prices obtained for several types of animals in these countries are weighted 50, 25, 15 and 10% respectively. An additional which represents transportation costs to the EEC frontiers should be added to the average weekly import price calculated.

ID = 20% over IP

In case of meat imports, the variable levy is calculated by multiplying the basic variable levy by a coefficient that takes into account the relationship between the value of the particular meat imported and the value of the live animal. The application of this levy was not automatic, but depended upon the relationship between the calculated reference price and the guide price.

The weekly calculation of the Reference or Market Price is made in the following fashion. A number of representative markets and weighting coefficients are assigned for different types and qualities of animals within each of the Six in such a way that a weighted average price is obtained for each member for adult cattle and for calves. Another weighting coefficient which considers the importance of each of the Six, is then used to obtain a unique Reference Price for all the EEC. The coefficients for France, Germany, Italy, Netherlands and Belgium are 41.0, 27.6, 19.0, 7.3 and 5.2% respectively.

The prelevement was applied gradually according to the relationship between the Reference Price and the Orientation Price. If the former was 105% above the latter

no levy was applied; the variable levy was 100% of the calculated value if the former was below the latter. Fifty per cent of the calculated prelevement was applied when the situation was between the two extremes.

Regulation 805/68 made some changes in the calculation and application of variable levies, the more important ones being the graduated scale which is used for its application and the determination of a new calculation procedure for frozen beef and veal. The latter will be explained first. A separate orientation price will be established annually for frozen meat and a separate import price set and modified if a change greater than US\$ 10.00 per Tm. takes place. With this new procedure, the variable levies for frozen meat will be different from those for fresh chilled meat. Prelevements for the first will be reported monthly before the 25th of the month and be applied on the first Monday of the following month.

The formula to use for the calculation of prelevements for frozen beef is:

$$VL_f = GP_f - (IP_f + ID + FL)$$

where:

VL_f = Variable levy per Tm. of frozen beef for compensated quarters or forequarters.

GP_f = Guide Price per Tm. of frozen beef.

IP_f = Import Price per Tm. of frozen beef
(determined on the basis of the more
favorable purchase possibilities among the
most representative markets).

ID_f = 20% over IP_f

F_f = Fixed Value, or Fixed Levy that represents
the expenditures incurred after the importa-
tion, such as transportation up to the
freezing chambers, and shrinkage. These
expenses have been fixed at the level of US\$
30 per Tm.

Coefficients greater than one are multiplied by VL_f when
the frozen meat to import is different from compensated
quarters or forequarters.

The changes in the graduated scale for application of
variable levies consist of changes of the brackets that
determine the relationships between reference and orienta-
tion prices and the percentages to pay over the calculated
levy. The scale in use is:

Reference Price as a Percentage of Orienta- tion Price	Percentage of the Calculated Levy that should be applied
greater than 106%	no prelevement
104 to 106%	25%
102 to 104%	50%
100 to 102%	75%
below 100%	100%

The utilization of this scale is common for fresh,
chilled and frozen beef.

The third type of domestic price defined by the
regulations is the intervention price. It was explained
that efforts are made to keep the market close to

orientation prices by means of variable levies. Another policy tool is also used for this purpose: market intervention when prices drop below the level of orientation prices established for the season.

Two types of decisions are necessary to effect this: the appointment of an agency within each of the Six to oversee purchases and sales, and the establishment of price levels at which these agencies were supposed to act. Intervention prices are alarm signals which mark the line below which price supports become effective. This type of price is closer to what is usually understood as a support price, since it is only when market prices reach this low level that agencies are entitled or obliged to act. According to Regulation 14/64, intervention measures could come into operation at a level to be decided by member states, somewhere between 93 and 96 per cent of the guide price. Selling operations, on the other hand, could be made if cattle prices were at least 98% of the guide price. Since the end of the transitional period on July 1, 1968, prices are supposed to be uniform throughout the Community and the level of intervention prices was also to be uniform. According to Regulation 805/68, purchases can be made when the EEC reference price for adult cattle is below 98% of the guide price, and when the market price for a specific quality meat in a member country or a region is below 93% of the equivalent orientation price. Purchases become compulsory in all the

Community countries as soon as the reference price for adult cattle falls below 93% of the corresponding orientation price. Intervention operations can be adopted not only for live cattle but also for fresh and chilled meat in the form of carcasses, half carcasses, compensated quarters, forequarters and hindquarters. The EEC Council can modify the products eligible for intervention.

Structural Reform Policies

Community authorities had high hopes for the described price policies. They foresaw that the higher price levels received by the producers, through the protectionistic system, would provide the basis for higher levels of income and consequently a more equitable relation with other sectors of the economy. Their hopes proved to be false, however, despite the fact that market prices rose and farm incomes increased. The level of income for the agricultural economy increased but not "pari passu" with the rest of the economy and the relationship continued its deterioration.

Migration from agriculture took place, but not at the speed necessary for per capita income in this sector to be comparable with others. Also, the higher price levels meant greater surpluses of butter, grains and sugar. As an example, the butter stock in the Community in January, 1970, amounted to 400,000 Tm.

The disappointment caused by these factors, together with the increase in expenditures caused by these policies, developed into further interest in structural policies. Policies aiming to increase the average size of the farm, to consolidate land holdings, and to modernize buildings, among others, have been contemplated since the inception of the Community, but have taken a secondary role. While the implementation and financing of price policies has been transferred from the national governments to the institutions of the EEC, the same did not occur within the structural reform policies. The CAP has as a secondary role, coordinating and organizing the skeleton of these policies. But the main administration and financing of them still remains very much in the domain of the national governments. Some changes are taking place, however. The Vice-President of the Commission, Sicco L. Mansholt (a staunch advocate of the structural policies) presented a ten-year agricultural reform program constituting the basis for discussion of programs that the Six might finally adopt.

The main problem, according to the Commission, is the excessively small size of farms in the Community. As many as 80 per cent of their farms are too small for one man to be fully employed using modern technology. Productivity could increase and specialization would allow for the elimination of present distortion in the allocation

of resources and for higher levels of income which would satisfactorily compare with those of the rest of the economy. The action would consist of removing economic and legislative obstacles that are now precluding increases in farm size, changes in land use that would permit specialization, and labor mobility. With respect to this last point, the Commission foresees very important changes in their current programs. They estimated that during the 1960s, 4.7 million people left farming and that an additional 5 million people would follow them during the 1970s.

The Mansholt programs do not generate much enthusiasm among farmers of the EEC and the program has consequently faced considerable resistance. It calls for fundamental changes in the emphasis of the CAP in favor of structural reform programs at the expense of price and market programs, and for massive expenditures to assist in enlarging farm production units, investment, aid, guaranteed loans and financial compensation for farmers leaving agriculture.¹

¹European Economic Community Commission, Second General Report on the Activities of the Commission, 1968, Publications Department of the European Communities, Brussels-Luxembourg, 1969, pp. 135-142.

Financing of the CAP

Constitution and Functions of the Fund

The European Agricultural Guidance and Guarantee Fund (EAGGF) was formed by the Council of Ministers on January 14, 1962, as the financial arm of the common agricultural policy. Their operations began during the 1962-63 marketing year, although the rules under which it was to operate were not completed until February 5, 1964.

The Fund has two sections, as its name suggests. The Guidance Section is responsible for most of the price and market policies, i.e., the policies analyzed under the section entitled Beef Regulations of the EEC Market, while the Guarantee Section takes care of the expenditures under Structural Reform Policies as well as for improvements in other elements of the marketing structure, such as fruit and vegetable auctions, slaughterhouses, refrigeration plants, etc.

Operation of the Fund

The expenditures of the Fund have constantly increased since its creation, because of three main reasons. The first is that a commodity is eligible for Fund support only after the organization scheme for its market has been defined and approved by the EEC Council. The number of commodities which have qualified for this support, in terms of market intervention operations or export refunds, has

increased, and by middle 1967, approximately 90 per cent of the agricultural output of the Common Market was covered by these regulations. The second factor is that the level of price supports and export refunds has also been constantly increasing. Finally, the Fund has, little-by-little, assumed responsibility for part of the expenditures which were the domain of the national governments; that is to say that the Common Market manages and finances operations formerly carried out by each of its member countries.

Due to the three factors, the Fund expenditures have climbed from US\$ 37.8 million for the agricultural year 1962-63, to 2,500 million for 1968-69. Total expenses between 1962 and 1968 amounted to US\$ 2.24 billion divided between US\$ 1.8 billion for the Guarantee Section, US\$ 284 million for the Guidance Section and US\$ 208 million under the Special Section. The Guarantee Section reported most of the expenditures of the Fund, 80 per cent; and the Guidance Section had only 13 per cent of the total. That the Guarantee Section was responsible for most of the increase can be seen from the figures in Table II.1 which are estimated for each marketing year from 1962-63 to 1968-69.

Another indication of the tremendous increase in expenditures is seen by the fact that the expenses for the marketing year 1968-69 were US\$ 2.5 billion, an amount greater than the total expenses accumulated between 1962 and 1968.

TABLE II.1.--Expenditures of the Guarantee Section of the European Agricultural Guarantee and Guidance Fund.

Marketing Year	Million of US\$
1962-63	28.7
1963-64	49.9
1964-65	175.7
1965-66	240.1
1966-67	370.4
1967-68	1.313.0
1968-69	2.012.0

Source: Calculated from figures from U.S.D.A.-E.R.S., The European Agricultural Guidance and Guarantee Fund, ERS Foreign 144, USA, June 1966, and several issues of European Economic Community Information Office, European Community.

The magnitude of the expenditures reached by the Fund has been an important source of conflict among the members of the Community. They realize that despite the rapid rise in expenditures in the Guarantee Section, the relative position of agriculture is worsening. A major problem area within the Guarantee Section is dairy products. The costs of the dairy policy, which did not amount to a million dollars during 1962-63 represented more than 600 million dollars during 1968-69. Other important problem areas are grains, vegetable oils and fats, and sugar.

But the costs of the CAP are not the only source of friction among the EEC members. The distribution of the financial burdens and benefits also constitute a cause of irritation. France received substantially greater benefits than the other members of the Community despite the fact that Germany is a greater contributor to the Fund, and Italy only a slightly less important contributor than France. Between 1962 and 1968, Germany paid a total of \$683.3 million while France and Italy contributed \$576.3 and \$533.3 million respectively. France, on the other hand, received a total of \$919 million, followed by Italy and Germany with \$522 and \$359 million respectively.

TABLE II-2.--Distribution of contributions and benefits of FEOGA among the member countries during the period 1962-68.

Member Country	Contributions Paid		Benefits Received	
	Millions (US\$)	%	Millions (US\$)	%
Germany	683.3	30.55	359	16.05
France	576.3	25.76	919	41.08
Italy	533.3	23.84	522	23.34
Netherlands	243.4	10.88	320	14.30
Belgium	195.4	8.73	110	4.92
Luxembourg	5.4	0.24	7	0.31
TOTAL	2.237.14	100	2.237	100

Source: European Community Information Office, European Community, December 1968-January 1969, No. 119, U.S.A., p. 15.

In percentages, France contributed and received 25.76 and 41.08 respectively and Germany 30.55 and 16.05 respectively.

Both circumstances, the high cost of the CAP and the failure of these expenses to augment farmers income pari-passu with those of the rest of the economy, and the unequal distribution of benefits, are putting pressure upon the authorities of the Council to restrict the protectionistic policies of the EEC. The amelioration of the protectionistic attitude has already been felt in the orientation prices adopted for the agricultural year 1969-70, where prices were maintained for most of the products and some decreases took place for dairy products.

The effects of the amelioration of their protectionistic policies probably will be felt also with respect to beef, despite the fact that only very minor expenditures have been directly allotted to it. The latest available figure shows that only \$2 million was allocated for these products during 1967-68, of a total US\$ 1,313 million spent within the Guarantee Section. Space for maneuverability seems to be still very wide in this area, even more if consideration is given to the unimproved level of self-sufficiency of beef of the Community. But special note also should be made that the dairy policy within the Community is not independent of the beef policy in its effects upon beef production. Cows are dual purpose

animals in the Community. They produce meat and milk, and the production of beef has been indirectly subsidized through the dairy policy. The limits for this policy already have been reached, as was previously seen. Giving incentives for increasing beef production within the Community would give rise to additional production of milk with the probable consequences of higher costs for storage and export subsidies, and this would be hardly tolerated. There are two possible ways the Community could try to increase beef production and give producers an opportunity to increase their revenues: import young animals from other countries to be fattened within the Community, and specialization of herds for independent production of beef and milk.

A closer look, however, suggests that both roads are difficult. The high transportation costs and special care which young animals require when being moved long distances limit the possible sources of supply of young animals to nearby countries. The second road is also seeded with thorns because specialization in beef and milk herds can only be achieved by means of an ambitious structural reform policy enabling larger farms to yield sufficiently high incomes by producing beef calves alone. Such an ambitious structural reform plan demands substantially greater expenses than those allocated at present for the Guidance Section. The unwillingness of

the Community authorities to decrease the level of price supports will result only in modest reductions in expenditures under the Guarantee Section, which consequently leaves a reduced capability for maneuvering, due to the invisible but apparently real limits for increasing the financing of the EEC-CAP. But even if this were possible, the development of such a program could yield results only in the long run. This is not to say that the possibility should be abandoned. On the contrary, the effects of these more fundamental long-run solutions should be researched if additional signs indicate that EEC authorities might follow this road.

CHAPTER III

BEEF TRADE BETWEEN ARGENTINA AND THE EEC COUNTRIES

One of the salient aspects of beef trade between Argentina and EEC has already been mentioned in the Introduction, i.e., that of the importance of the EEC as an outlet for Argentina exports. Others to be analyzed are the importance of Argentina as a supplier for the Common Market, the longrun tendency for increases of EEC imports, the short-run variability of their imports, the comparison between the rates of growth of total beef imports of the EEC and that of exports of Argentina, the changes in the level of import of the Six since the implementation of the Regulation for beef, and the changes in the composition of Argentine exports to this region. Each one of these aspects will be analyzed separately.

The Common Market as an Outlet for Argentine Exports

If the countries composing the EEC are considered as a single market,¹ this is the most important outlet Argentina has today for her beef exports. Table 1 shows

¹The existence of free trade within the area and of common tariff and non-tariff barriers allow for this consideration.

TABLE III-1.--Argentine exports of fresh, chilled and frozen beef, 1956-1967.
(Th. Tm. of product weight and percentages)

	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
Total Exports	359.6	363.5	362.8	343.2	285.3	258.9	289.1	531.1	420.8	347.7	401.4	380.8
U. Kingdom	247.9	268.3	256.3	217.1	199.8	153.8	195.2	227.7	143.0	108.4	121.6	96.4
Perc.of the tot.	68.94%	73.81%	70.64%	63.27%	70.02%	57.22%	50.18%	42.88%	33.98%	31.17%	30.28%	25.32%
Germany	61.2	27.9	29.4	39.4	9.1	17.3	26.3	27.9	47.8	38.0	23.1	12.9
Italy	22.7	28.3	25.8	30.9	31.9	34.7	58.0	86.5	104.9	61.7	57.0	69.1
Netherlands	5.4	4.2	6.8	11.7	7.4	12.8	16.8	18.0	20.5	19.4	31.0	35.9
Belgium	0.7	3.8	5.1	2.7	4.1	10.9	12.8	18.3	15.9	7.9	9.7	12.3
France	2.5	4.7	4.3	0.7	0.6	0.3	0.2	5.9	17.1	10.8	8.1	16.1
European C. Market	92.5	68.9	71.4	85.3	53.2	76.0	114.0	156.6	206.2	137.8	128.9	146.3
Perc.of the tot.	25.72%	18.95%	19.68%	24.86%	18.64%	28.25%	29.29%	29.49%	49.01%	39.64%	32.12%	38.42%
MCE + U.K.	340.4	337.2	327.7	302.5	252.9	229.8	309.2	384.3	349.2	246.2	250.5	242.7
Perc.of the tot.	94.66%	92.77%	90.31%	88.14%	88.65%	85.47%	79.47%	72.36%	82.99%	70.80%	62.40%	63.73%

SOURCE: Junta Nacional de Carnes, Reseña, several issues.

that the level of exports has increased since 1957. In 1967 this market absorbed 146,300 Tm. which represented over 38% of the total beef exports, while the exports to the next most important outlet reached 96,400 representing over 25%.

The same table can also show that this market has not always been as important. For decades the United Kingdom was even more important than today's Common Market. For many years Argentine exports to the U.K. represented more than 75% or 80% of the total. The increasing levels of per capita income in the Six, together with their population increases tended to displace the U.K. from her position. Sales to the U.K. decreased from 268,328 Tm. in 1957 to 96,400 in 1967, but in the Six the opposite happened. In 1967 sales were more than double those in 1957. The case is similar when considered in relative terms.

For 1957 the shares for the U.K. and the EEC were almost 74 and 19% to change in 1967 to a situation where the ranking changes: 25% and 38% respectively.

Upon closer observance, it becomes apparent that the increasing importance of the European Common Market is due mainly to exports to Italy and the Netherlands.

Italy increased her purchases from Argentina from 28,300 to 69,100 Tm. between 1957 and 1967, while the Netherlands went from 4.2 to 35.9 thousand Tm. for the same period.

Increasing Long-Run Tendency
of EEC Imports

Table 2 shows that total imports of the EEC have trebled between 1958 and 1967, going from 182,800 to 556,000 Tm. The largest increases, in 1963 and 1964, took place after the year of the last drought that affected most of Europe. The unusual number of slaughterings during 1962 had the effect of reducing the level of slaughterings in 1963 and 1964 in the three most important producers and consumers of the Community. Since the level of consumption increased in 1963 and remained at the same level in 1964, with respect to 1962 the level of imports increased considerably during these years.

The peak of imports reached during 1964 tended to be arrested during the following years due to two major factors. Herd rebuilding began to take place right after the drought, and by 1965 the first effects of the increases showed up in increased slaughterings in France, Germany and Netherlands. This was continued the following year by all the countries in the Community. The second factor was the enforcement of Regulation No. 14 in 1964. As mentioned in Chapter II, the regulation purported to organize the beef market according to the objectives of the CAP. The Regulation, which began to be implemented by November, 1964, formed the basis of an increased EEC protectionistic policy, with detrimental effects to non-member countries.

TABLE III-2.--Argentine share of total beef imports of the EEC, 1958-1967.^a
(thousands of long tons)

Origin	1958	1959	1960	1961	1962	1963	1964	1965	1966	1967
	Total EEC Imports									
Belgium	7.4	5.5	8.4	12.3	16.6	20.1	22.4	17.4	14.0	23.7
France	22.7	27.2	26.6	10.7	9.5	15.5	71.7	58.4	36.3	n.a.
Italy	118.2	98.5	134.6	52.9	93.2	254.0	282.8	249.3	273.0	n.a.
Netherl.	11.6	17.4	14.2	21.3	20.8	17.5	30.1	24.4	32.4	n.a.
W.G.	22.9	52.6	63.6	82.3	103.8	89.7	115.8	145.0	123.6	131.9
Total	182.8	201.2	247.4	179.5	243.9	396.8	522.8	494.6	479.2	556.0
	Imports from Argentina									
Total	61.1	64.0	51.7	66.1	86.3	128.3	191.2	126.3	120.8	147.0
% from Arg.	33%	32%	21%	37%	35%	32%	36%	26%	25%	26%

NOTE: ^aThe figures of total exports of Argentina to the EEC differ from those of Table 1 in part because these are expressed in long tons and the others in Tm. and in part because of the different source.

SOURCE: Commonwealth Economic Secretariat, Meat: A Review, the Commonwealth Economic Secretariat, London, several issues.

The most visible and important manifestations of this protectionistic policy are seen in the level of orientation prices annually determined by the EEC Council of Ministers and by the financing expenditures of the CAP. The orientation prices for adult cattle increased in France from US\$ 552.50 per liveweight Tm. in 1964-65 to US\$ 680 during 1968-69, an increase of 23%. Since variable levies for cattle were calculated by subtracting import prices plus ad valorem duties from orientation prices, the variable levies importers were to pay¹ tended to grow pari passu with the rises in orientation prices.² The same thing took place with beef. The prelevement eligible was calculated by multiplying the basic variable levy for cattle by a transformation coefficient that considered the value relationship between the mean in question, and the live animal. As explained in Chapter II, the calculated prelevement was to be applied dependent upon the relationship between orientation prices and domestic market prices. But as the level of orientation prices was being determined so that production would tend to be stimulated, the normal situation became that of orientation prices above domestic market prices. The

¹ If market prices were not greater than orientation prices.

² Assuming constant import prices. In fact, import prices tended to drop and variable levies consequently tended to increase even more.

consequence was that during the first months of the implementation of Regulation 14/64, no prelevement was applied, then 50% of it was applied off and on. Afterwards, the use of a 50% became normal and the 100% levy entered the scene. However, although mathematics would put a logical limit at a 100% levy this is not satisfactory enough when considering that the 100% may mean very different levels in absolute terms as the policy decision makers raise the level of orientation prices. It would be too tedious to analyze the weekly evolution of these variable levies, but relating their annual average to that of import prices will be illustrative.¹ Table 3 shows that the average of levies increased from 0 in 1964 and 1965 to 140, 215 and 373 in 1966, 1967, and 1968, and ended in July, 1968 at US\$ 415 per Tm. An "ad valorem" import duty of 20% (upon the CIF import price) is also applied. It might be interesting to translate these variable levies into "ad valorem" duties to find out how important they are in comparison to the "ad valorem" duty of 20% applied. Using Italy again as an example, the prelevements applied would be equivalent to "ad valorem" duties of 0 in 1964 and 1965, and 66% in 1968. By adding this 66% to the actual "ad valorem" of 20% we would have a total of 86% for Italy in comparison to an "ad valorem" duty for the United Kingdom of only 20%.

¹The unrealistic nature of this calculation is realized, but thought to be useful.

TABLE III-3.--Simple annual averages of variable levies applied in the EEC and equivalent "ad valorem" duty that they represent.

	1964		1965		1966		1967		1968		July 1968	
	Vari- able Levy (US\$)	Over Import Price %	Vari- able Levy (US\$)	Over Import Price %	Vari- able Levy (US\$)	Over Import Price %	Vari- able Levy (US\$)	Over Import Price %	Vari- able Levy (US\$)	Over Import Price %	Vari- able Levy (US\$)	Over Import Price %
Belgium	0	0	14.16	1.6	147.97	18.3	194.06	26.3	201.87	33.6	415.05	66.0
France	0	0	8.40	0.9	102.51	12.7	259.14	35.2	386.11	64.2	414.04	66.0
Germany	0	0	0	0	66.12	8.2	88.20	12.9	334.98	55.7	353.54	56.2
Italy	0	0	0	0	139.63	17.0	214.65	29.1	372.54	62.0	415.04	66.0
Netherlands	0	0	30.95	3.5	151.66	18.7	237.98	32.3	205.12	34.1	226.02	35.9

SOURCE: Prepared with data from Junta Nacional de Carnes.

Despite the protectionistic policy, the Common Market has not been able to increase its level of self sufficiency in beef, and there are indications (other than those provided here) that it might tend to decrease. The recent study published by the Institut Für Wirtschaftsforschung (IFO)¹ presents the following table (Table 4), where the percentage is 93, 85, 86, and 76 for 1960, 1965, 1970, and 1975 respectively.

That study implies that the level of net imports will increase in 1975 to 1970 levels. This study, which is a summary of 6 independent research efforts, projects the highest level of net imports for Italy at 700,000 Tm. Following in order of importance are France and Germany with 319,000 and 273,000 Tm. respectively.

There have been other studies evaluating the future market for agricultural products, with beef as a separate commodity. One has been developed at Michigan State University under the leadership of Dr. Dale E. Hathaway and Vernon L. Sorenson.² Most of these studies project considerable increases in the level of beef imports.

¹Aggregation of Future Demand and Supply for Agricultural Products in the European Economic Community 1970-1975, München, Germany, 1969, Tables 6-11 (mimeographed).

²Table 9 of Chapter VI shows the results of their research together with those of other studies.

TABLE III-4.--Beef supply-demand balance.
(1,000 tons^a)

	Germany	France	Italy	Netherl.	Bel.-Lux.	EEC
1960						
Production	912	1,400	441	231	199	3,183
Net Imports	+ 125	- 66	+ 199	- 27	+ 6	+ 237
Consumption	1,037	1,334	- 640	204	- 205	3,420
Self supply %	88	104	69	113	97	93
1965						
Production	959	1,541	453	244	184	3,381
Net Imports	+ 286	- 34	+ 341	- 23	+ 36	+ 606
Consumption	1,245	1,507	- 794	221	- 220	3,987
Self supply %	77	102	57	110	84	85
1970						
Production	1,234	1,810	510	306	234	4,094
Net Imports	+ 166	+ 29	+ 492	- 42	+ 15	+ 660
Consumption	1,400	1,839	1,002	264	- 249	4,754
Self supply %	88	98	51	116	94	86
1975						
Production	1,235	1,767	495	324	238	4,059
Net Imports	+ 273	+ 319	+ 700	- 25	+ 37	+ 1,304
Consumption	1,508	2,086	1,195	299	- 275	- 5,363
Self supply %	82	85	41	108	87	76

NOTE:

^aExcluding carcass fats.

Short-Run Instability of Argentine
Exports to the EEC

Table 1 shows the variability of the quantity of Argentine exports to the Common Market. The largest absolute change was registered between 1964 and 1965 when exports dropped 68,000 Tm. Of tremendous importance also was the decrease between 1967 and 1968¹ and the increases which took place between 1962 and 1963, 1963 and 1964, and 1968 and 1969.² This variability has very undesirable repercussions, not only on the price levels at the exporter and producer level, but also because of the inducements they provide for heavy slaughtering of cows. A painful herd rebuilding process usually continues until a similar situation takes place. It is no exaggeration to say that short-run instability is as serious a problem as the existence of an adequate export market.

The most important reason for export instability seems to be the variability in the level of domestic

¹Data for 1968 and 1969 were available only after writing and elaboration of the tables was completed and is preliminary, but the indications are clear as to the direction and approximate magnitude of the changes. The following figures obtained from the Junta Nacional de Carnes show Argentine exports of fresh, chilled and frozen beef (thousand Tm. of product weight).

	1967	1968	1969
Total Exports	380.8	278.1	426.5
United Kingdom	96.4	41.7	124.1
Common Market	146.3	94.4	134.4

the fall between 1967 and 1968 and of the increase between 1968 and 1969.

²Ibid.

slaughter in the EEC countries. Given that the difference between consumption and domestic slaughter is basically filled by imports, the level of imports increases or decreases as the level of domestic slaughter decreases or increases respectively. Starting with the application of Regulation 14 in 1964, the objective of achieving a stabilization of the markets in the Six tended to result in more violent variations. The reason for this was that while before the application of that Regulation variability in the level of domestic prices was allowed with no restrictions (allowing in turn for some stability in the level of imports), after Regulation 14/64 was enforced prices are permitted to vary much less than before. Levies are applied as the level of domestic price drops below the orientation price, and, consequently, as the level of domestic price declines because of increased slaughterings, it becomes harder to import. Prices tend to be kept at the level of orientation prices, while before 1964 they were allowed to vary.

Unfortunately there are no signs of possible future changes in the application of orientation and intervention prices and variable levies as a mechanism for achieving market stabilization. The importance of the fluctuations could be reduced if prices increase to such an extent that domestic prices are above the orientation prices determined by the Council of Ministers. There are some prospects,

as will be seen later, that the height of variable levies to be applied to achieve the stabilization of the markets would tend to decrease as domestic demand in the Six increases with respect to domestic slaughterings.

A Comparison of the Rate of Growth
of Total EEC Beef Imports and
Argentine Exports

It is possible to observe, selecting 1958 and 1967 as reference points for the calculation of increases, that the average annual rate of growth of total imports of the Community was greater than that of imports coming from Argentina (20.4 against 14.1%). It also appears that total slaughters for exports of Argentina grew at a much slower annual rate than for Argentine slaughters for exports to the Community (0.5 against 14.1%). The rate of growth of total Argentine slaughters was even lower than that of total Argentine slaughters for exports. The following observations could be made from the figures in Table 5:

1. The increase in Argentine exports to the Six did not keep pace with the total imports;
2. The increase in total slaughters and slaughters for exports in Argentina was very small in comparison with the rates of increase mentioned in (1).

Using three-year averages at the beginning and end of the period shows a similar picture. The beef imports of

TABLE III-5.--Growth of EEC Beef Imports and of Exportable Surpluses of Argentina.

Concept	1967	1958	Growth 1958-1967	% Growth Over 1958	% Net Growth	Annual Net Aver. % Growth
EEC Beef Imports	556.0	182.8	373.2	304.2	204.2	20.4
EEC Imp. from Argentina	147.0	61.1	86.0	240.6	140.6	14.1
Argent. Slaught. for exports	680.0	647.1	32.9	105.1	5.1	0.5
Total Argent. slaughtering	2,570.00	2,540.00	29.1	101.1	1.1	0.1
Argent. Slaught. for Cons.	1,890.00	1,893.8	- 3.8	99.8	- 0.2	- 0.0
Concept	Average 1965-67	Average 1958-60	Growth 1958-60/ 1965/67	% Growth Over 1958-60		
EEC Beef Imports	509.9	210.5	299.4	242.3	142.3	14.2
EEC Imp. from Argentina	131.4	58.9	72.4	222.9	122.9	12.3
Argent. Slaught. for exports	589.4	516.3	73.1	114.2	11.4	1.1
Total Argent. slaughtering	2,295.3	2,126.1	169.3	108.0	8.0	0.8
Argent. Slaught. for Cons.	1,705.9	1,609.7	96.2	106.0	6.0	0.6

the Community experienced a net growth of 142%, while the exportable surplus in Argentina grew by only 11% and that exported to the Community by 123% between 1958-60 and 1965-67. In other words, increasing Argentine exports to the Community was done at the expense of other markets, despite the smaller share of Argentine beef in the total imports of the Six.

Changes in the Composition of
Argentine Exports to the
Community

An unfavorable shift has been taking place in Argentina's exports to the Six. The following table shows that while the quantities did not change in an important fashion between 1965 and 1969, the proportion of chilled has been decreasing and frozen beef increasing. This change represents a deterioration in dollar value (given that the former is better quality meat and demands higher prices for each equivalent metric ton). This change will be stressed in the future due to the new Regulation adopted in 1968. Regulation 858/68 favors the imports of frozen beef, and mainly that for manufacture, at the expense of chilled beef. Consequently, unless some important changes take place in EEC regulations, such as a more favorable treatment for chilled beef, there is a risk of these higher quality meats being eliminated from the market.

TABLE III-6.--Composition of Argentine beef exports to the EEC (Thous. Tm. of product weight).

Year	Chilled	Frozen	Total	Total Value in FOB Term (mill. US\$)
1965	35	103	138	100.6
1966	17	112	129	89.4
1967	14	132	146	88.6
1968*	4	90	94	56.3
1969*	13	121	134	80.6

* Provisory estimates.

Source: Junta Nacional de Carnes, several issues.

CHAPTER IV

THE ECONOMIC MODEL

A static partial equilibrium model will be used to represent the location of production, consumption, prices and trade of beef among the 15 regions into which the world has been divided.

A simplified model of two regions will first be assumed. Figures 1a and 1c show the demand and supply relationships corresponding to regions 1 (d_1 and s_1) and 2 (d_2 and s_2) whereas Figure 1b presents the supply of exports of the first region (sx_1) and the demand for imports of region 2 (dm_2). Under no trade conditions quantity slaughtered (s_1^{-1}) in R1 (region 1) would equalize consumption (d_1^{-1}) and the same would happen in R2 : $s_2^{-1} = d_2^{-1}$. Prices would be p_1^{-1} and p_2^{-1} respectively. Prices would be lower in the first region than in the second and there would be no quantities supplied for exports in R1 or demanded for imports in R2.

Consumer surplus in R1 is given by $\overset{\Delta}{MLN}$ and producer surplus by $\overset{\Delta}{KLN}$ under this equilibrium condition. Changes in these conditions brought about by the opening of trade would carry out alterations in the level of these surpluses through shifts in price levels and quantities traded.

FIGURE IV - 1 - GAINS FROM TRADE

Figure 1a

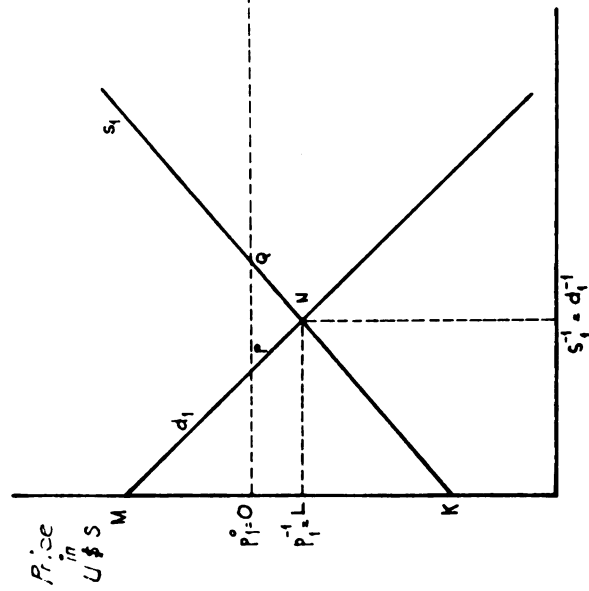


Figure 1b

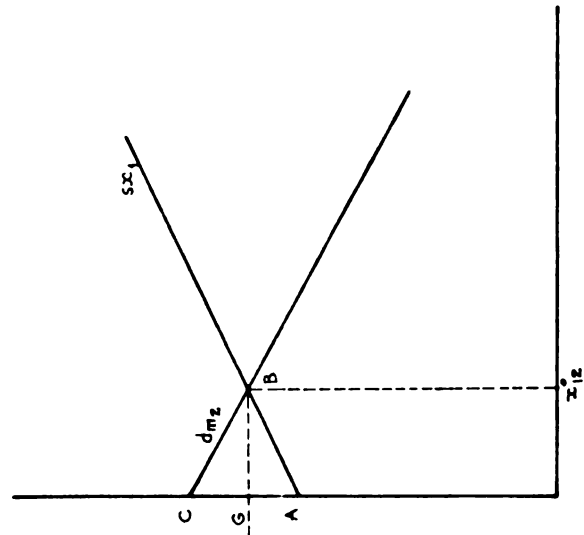
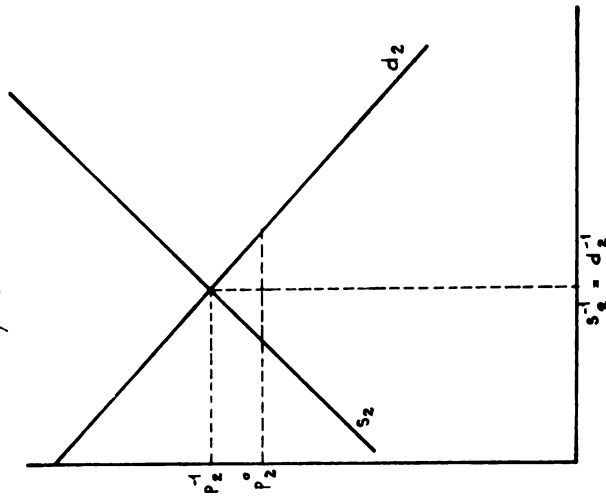


Figure 1c



Carcass weight T_m of beef and veal

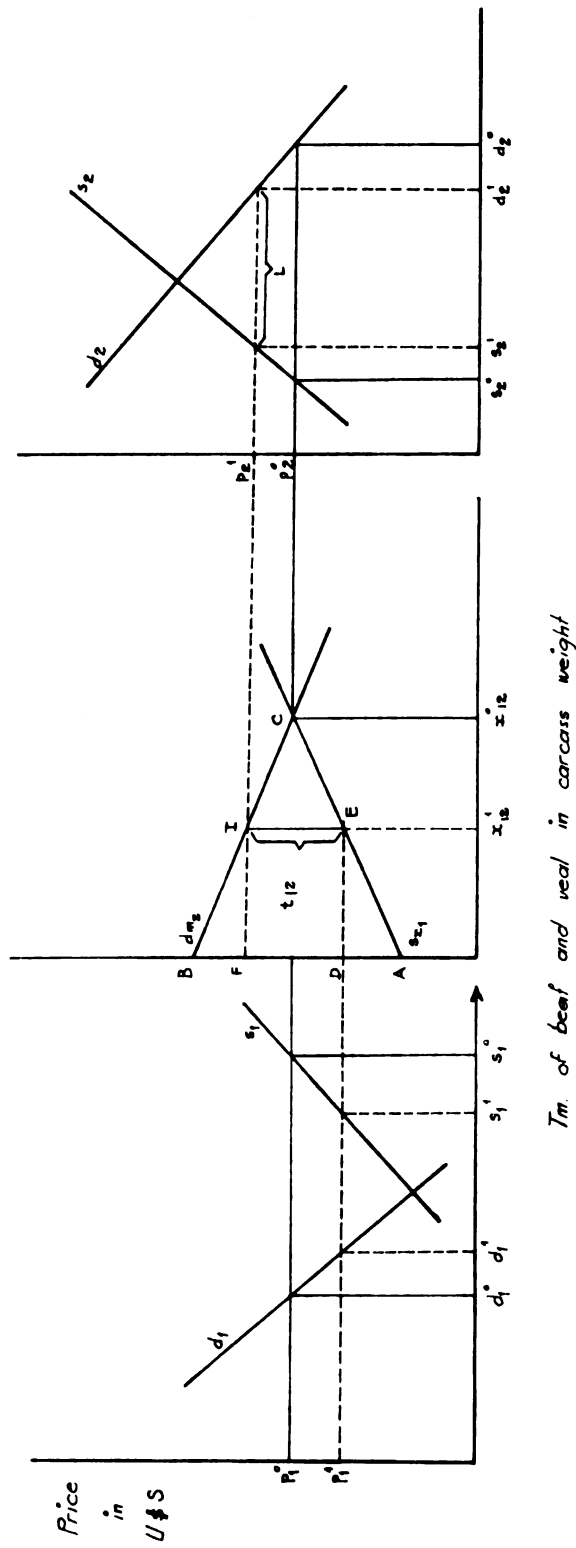
Under the assumption of free trade, for example, prices would climb up from p_1^{-1} to p_1^0 in R1 which would imply an increase in producer surplus from $K\overset{\Delta}{L}N$ to $K\overset{\Delta}{O}Q$. Consumer surplus would, on the other hand, drop from $M\overset{\Delta}{L}N$ to $M\overset{\Delta}{O}P$. The net effect derived from these two opposite changes is an increase in the level of welfare of R1 equal to $P\overset{\Delta}{N}Q$ of Figure 1a which is equal to the area of $A\overset{\Delta}{G}B$ of Figure 1b. Something similar takes place in Figure 1c when price drops to p_2^0 : consumer surplus increases and producer surplus decreases, the net effect being an increase in welfare for that region equal to $C\overset{\Delta}{G}B$. The total gains derived from free trade are then equal to the addition of increases in welfare of both regions, that is $A\overset{\Delta}{B}C$.

The gains from trade for R1 can then be represented by the area above the supply of exports function which has as an upper limit the equilibrium price level for the country. Those for R2 can be expressed by the algebraic area under its demand for import function with the lower boundary given by its price level.

Free Trade and No Transfer Costs

Assuming free trade and no transfer costs between both regions the equilibrium level of production, consumption, trade, and prices in region 1 ($s_1^0, d_1^0, x_{12}^0 = s_1^0 - d_1^0, p_1^0$) and region 2 ($s_2^0, d_2^0, x_{12}^0 = s_2^0 - d_2^0, p_2^0$) can be determined (see Figure 2). The level of welfare reaches a maximum at these equilibrium solutions.

FIGURE IV - 2 - TRADE WITH A TRANSFER COST.
A FIXED IMPORT DUTY OR A QUOTA



T_m of beef and veal in carcass weight

The existence of transfer costs (see Figure IV-2) decreases the level of welfare that could be achieved in its absence due to the reduction in trade. If t_{ij} is allowed to represent the transfer costs of shipping one unit from region i to j ,

Net gains from trade = area under dm_2 + area over sx_1 - TC,

where TC = transfer cost

$$= ABIE - t_{ij} (x_{ij}^0)$$

$$= ABC - (IE \cdot x_{12}^1) - ICE = FBI + ADE$$

The solution obtained by maximizing the net gains from trade function coincides with the objective of profit maximization that we assume each region pursues. Consequently region 2 will import from region 1 if the difference in prices between them is large enough so as to exceed transfer costs. R1 will export to R2 if $p_2 - p_1 > t_{12}$ and if $p_2 - p_1 < t_{12}$ there will be no trade. At the equilibrium point, where net welfare is maximized

$$p_2 - p_1 = t_{12}$$

Up to this point we have considered a free trade model. The analysis of the problem that concerns us requires, however, the introduction of policy restrictions and the analysis of their effects upon production,

consumption, trade and prices. The effects of the various policies which have been used in the past and which could probably be used in 1975 will be successively surveyed. To simplify, the existence of other policy instruments, which could be simultaneously used, will be assumed away. The incorporation in the importing country (R2) of a fixed import duty has the same effects upon production, consumption, trade and prices in each region as the introduction of transfer costs. We could assume that Figure 2 represents the hypothetical case of two countries without transfer costs and where t_{12} is the level of the fixed import duty that R1 faces when exporting to R2.

The price differential will at the trade limit be

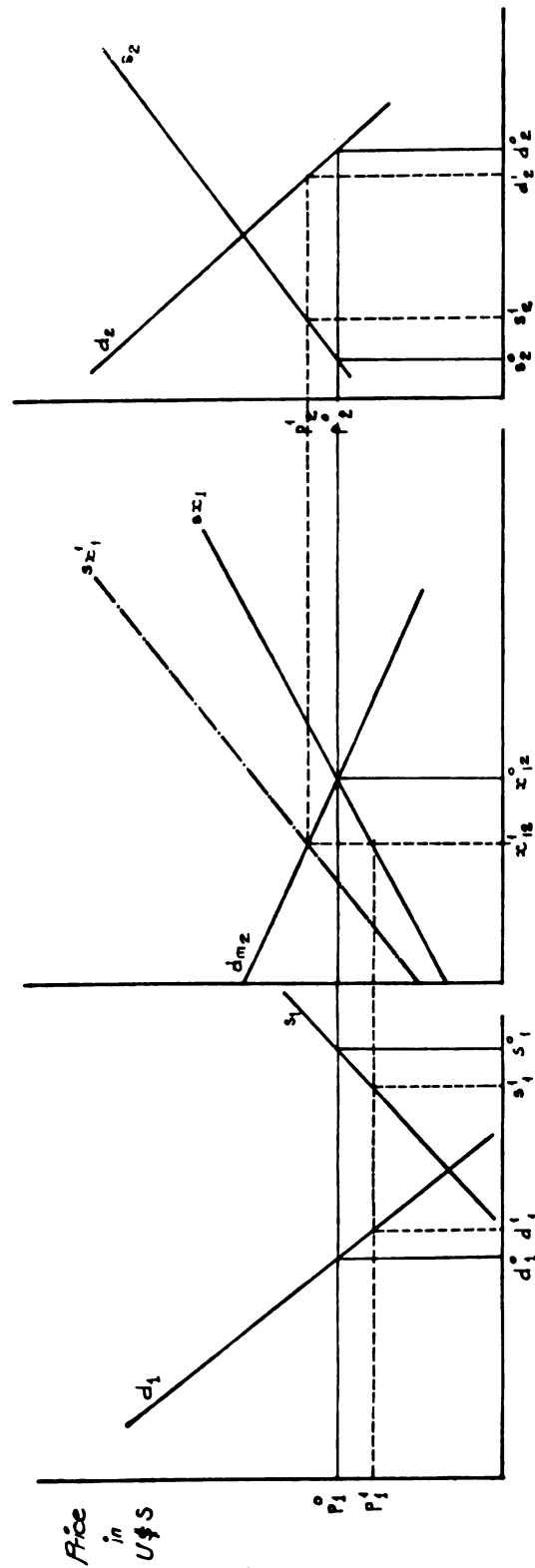
$$p_2 - p_1 = fd_{12}$$

fd_{12} being the fixed duty of R2 for commodities coming from R1.

"Ad Valorem" Import Duty

The incorporation of an ad valorem import duty in Figure IV-3 is similar in its effects to that of the previous policy. It would have been possible to think in Figure 1 of an upward parallel shift in the supply of exports of R1 when transfer costs or fixed import duties were considered up to point I where dm_2 would have intercepted sx_1 . Under the case of an "ad valorem" duty, sx_1 ,

FIGURE IV - 3 - TRADE WITH AN "AD VALOREM" IMPORT DUTY



Carcass weight Tm. of beef and veal

in Figure 3 would shift upwards but in proportion to the price level that corresponds to each level of sx_1 . If this were the only restriction to trade, the new supply of exports of R1 would be sx_1^1 and production would have decreased in R1 from s_1^0 to s_1^1 , increased in R2 from s_2^0 to s_2^1 , while consumption would go up from d_1^0 to d_1^1 in R1 and on the contrary fall down from d_2^0 to d_2^1 in R2. The level of imports in R1 would contract to x_{12}^1 and prices would decrease in R1 at the time that they increase in R2.

The reason for not having a parallel shift in the sx_1 is that the duty is here a function of price in the exporting country. Therefore, the equilibrium solution for this case is at

$$p_2 - p_1 = kp_1$$

whereas k is the percentage "ad valorem" duty determined on the basis of FOB prices at R1. For those cases where this duty is applied on the basis of CIF prices, as in some European countries, the equation will be

$$p_2 - p_1 = t_{12} + k(p_1 + t_{12}) = t_{12} + k t_{12} + k p_1$$

$$p_2 - (1 + k) p_1 = (1 + k) t_{12}$$

Fixed Import Quota

The use of an import quota by the importing country, that is

$$x_{12} = x_{12}^1, \quad x_{12}^1 \text{ being a constant}$$

sets up a constraint to the level of imports of R2 coming from R1 and can be reflected in Figure 2 where the application of a quota equal to x_{12}^1 has the same effects of the previous fixed import duty. In this particular instance we have chosen the size of the quota in such a way that the results are identical to those achieved with a fixed import duty equal to fd_{12} .

Sanitary Regulations

Import restrictions due to sanitary regulations can be handled in the same way as the previous instrument, except that the level of the restriction is set equal to zero.

Voluntary Export Restrictions

Voluntary export restrictions can be managed in a similar way to fixed import quotas except that the restriction operates on the exporter side. The exporter agrees not to go beyond a certain export volume, since he knows that otherwise restrictions on the importer side will become operative.

Fixed Export Tax

The implications of using a fixed export tax, such as that which New Zealand uses for beef, is the same as if the import duty is established at the importing country. The exporter ships to the importer up to the point where

$$p_2 - p_1 = ft_{12}$$

where ft_{12} is the tax to be paid in R1 to export one unit to R2.

"Ad Valorem" Export Tax

The adoption of an "ad valorem" export tax in R1 has the same effects as an "ad valorem" import duty for R2, already discussed.

Fixed and "Ad Valorem" Export Subsidies

Fixed and "ad valorem" export subsidies in the exporting zone have exactly the opposite impact of fixed and "ad valorem" export taxes, respectively.

Variable Levies

Variable levies such as those used by the EEC countries are much harder to introduce in a model than any one of the policy instruments already discussed. Their effects are the same as those of a fixed import duty once their calculation and application is made, but

a complex process takes place at the calculation stage. Its determination¹ should be endogenous to a model which encompasses not only beef but also trade in live animals. Since this model does not cover trade in live animals, variable levies will be dealt with as exogenous and handled as if they were fixed import duties.

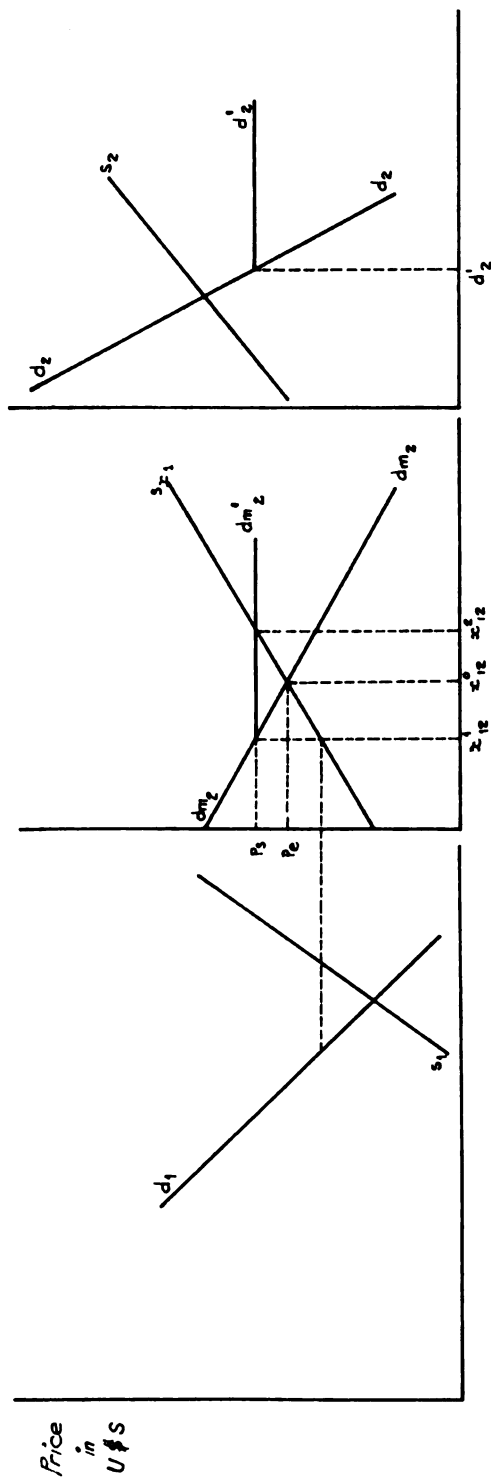
Domestic Price Supports

The inclusion of domestic price supports, through purchases and sales, and variable levies as in EEC countries or by taxes at the slaughtering stage as in Denmark or by any other mechanism, can provide a minimum price at which the sellers will be able to market their goods. No matter what the increase in supply or the fall in the demand schedule is, this minimum price is guaranteed to be received for each unit. As Figure 4 shows for prices above the supported level, the market will act freely without intervention.

The equilibrium world price would have been p_e in the absence of a domestic support price in R2. But if the support price is established at p_s the domestic demand curve becomes $d_2 d_2^1$ with a kink at the price at which the support becomes effective. Also, the demand for imports is transformed from $dm_2 dm_2$ to $dm_2 dm_2^1$. But without some kind of import restriction, the quantity shipped to R2 would be x_{12}^2 while the level of consumption would only be

¹See Chapter II.

FIGURE IV - 4 - TRADE WITH A DOMESTIC PRICE SUPPORT



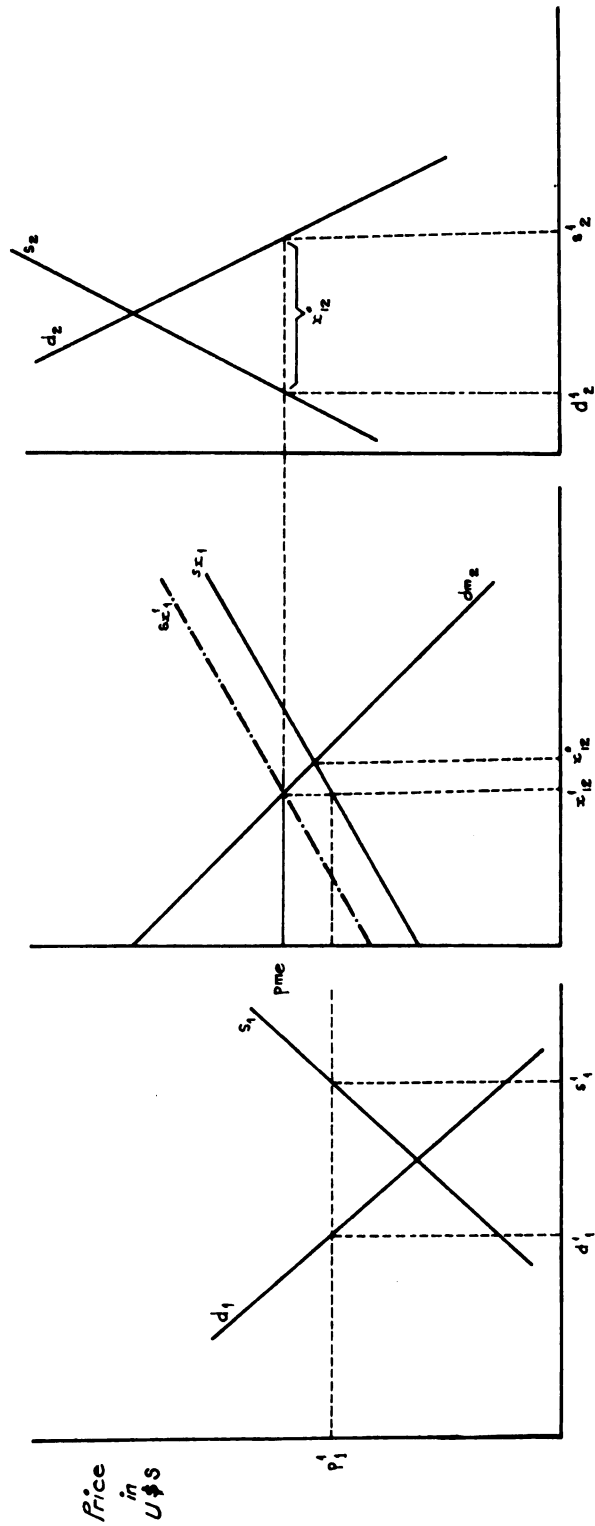
Carcass weight Tm. of beef and veal

d_2^1 . The excess of imports over consumption of R2, equal to x_{12}^2 minus d_2^1 , would have to be stored, reexported or disposed in some other way. The way to avoid this circumstance is to impose a duty that will help to reinforce the desired minimum price. The levy should equal the vertical distance between the kink of dm_2 dm_2^1 and the sx_1 . The level of exports and imports will be x_{12}^1 and price in the exporting country will drop below the previous equilibrium level p_e .

Minimum Export Prices

The use of minimum export prices (see Figure IV-5), which are supposedly above the free trade equilibrium level, is equivalent, as far as its effects on prices and quantity of exports are concerned, to the use of an export tax that will reduce the supply for exports. If pm_e is the desired minimum export price, the specific export tax should be such that sx_1 would move up to the point where it would intercept the demand for imports of the other region at the pm_e level and x_{12}^1 quantity. The new supply for exports will be sx_1^1 and the price received in the domestic market of R1 will equal pm_e minus the amount of the export tax, i.e., p_1^1 . However, since this way of implementing minimum export prices might not fulfill the objective of higher prices for producers of R1, this government would perhaps be willing to use another route. A more satisfactory way would be to use any administrative

FIGURE IV - 5 - TRADE WITH A MINIMUM EXPORT PRICE

Carcass weight T_m of beef and veal

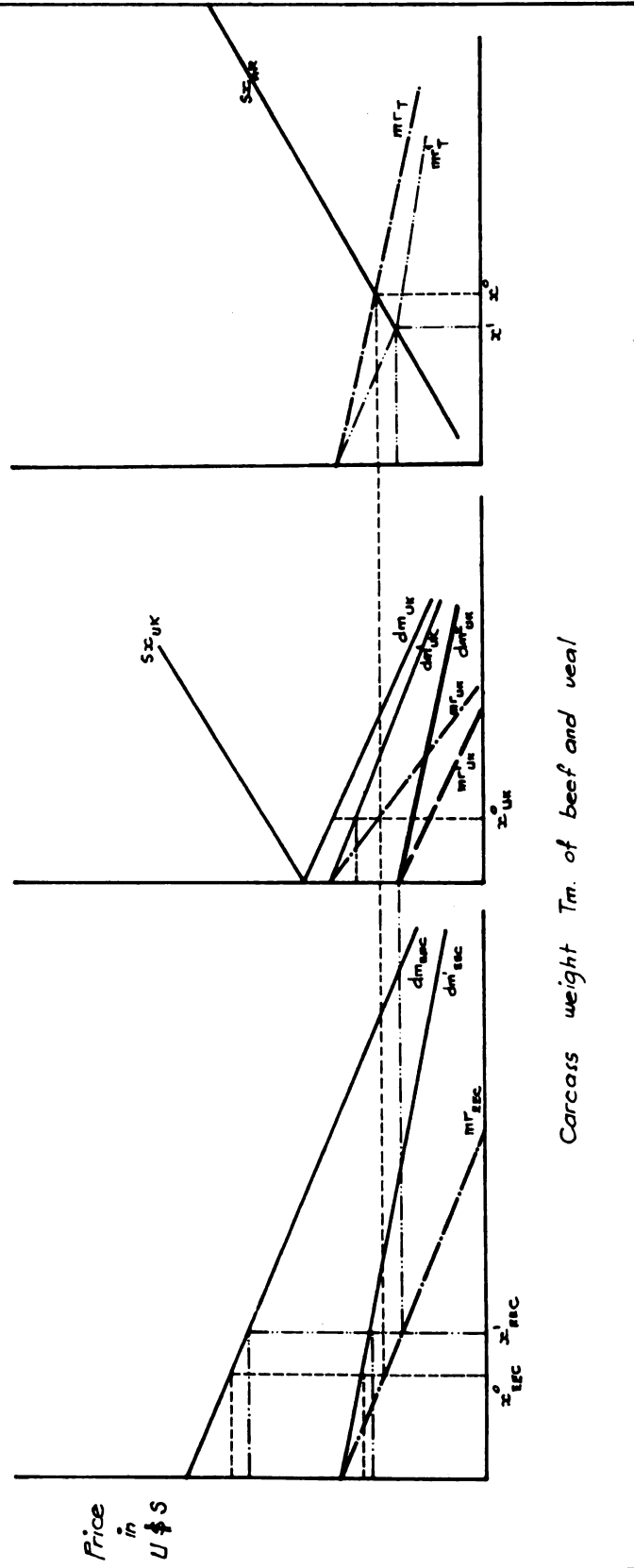
device that would require an export contract be equal to the decreed price.¹

United Kingdom as an EEC Member

One alternative is that the United Kingdom be allowed to enter the European Economic Community. But since we are interested in the effects that such a situation might create for Argentine exports, it will be necessary for our analysis to include not only a group of countries which represent the Common Market and another with a set of supply and demand functions for the United Kingdom, but also a third country which has kept relations with these countries although it has not and is not going to become a partner. The left quadrant of Figure 6 shows the demand for imports of the EEC (dm_{EEC}), the same schedule subject to an "ad valorem" duty of 100 per cent (dm_{EEC}^1) and the marginal revenue curve that a non-member country would face if willing to sell in such a market (mr_{EEC}). The quadrant of the center for the United Kingdom also presents the three schedules mentioned above for the United Kingdom (dm_{UK} , dm_{UK}^1 , mr_{UK}) but the original "ad valorem" duty we will first assume here is 20 per cent. An additional demand for import schedule (dm_{UK}^2) drawn under the restriction of an "ad valorem" duty equal to

¹This is the plan the Argentine government has followed for exports to the United Kingdom. Previously, exports were made on a consignment basis and their prices were subject to fluctuations.

FIGURE IV - 6 - EFFECTS OF THE U.K. ENTRANCE INTO THE EEC UPON ARGENTINE EXPORTS.



that of the EEC, and the corresponding marginal revenue curve (mr_{UK}^1) are also shown. Lastly, the quadrant of the right depicts the supply of export of Argentina (sx_{AR}) together with the horizontal summation of the marginal revenue functions of the other two quadrants. That is to say, mr_{EEC} plus mr_{UK} gives mr_T and mr_{EEC} plus mr_{IK}^1 yields mr_T^1 . Up to this point, the only difference with a regular treatment of price discrimination is in considering that the demand for import curves is subject to "ad valorem" duty constraints. We have also allowed for the U.K. to become an exporter if prices increase enough (sx_{UK}).

Supposing first that the U.K. is not an EEC member but opposes a 20% duty to Argentine exports, while that of EEC is equal to 100% Argentine exports will be equal to x^0 . This quantity is distributed between EEC, x_{EEC}^0 , and the UK, x_{UK}^0 , in such a way that mr_T equals its marginal cost curve (sx_{AR}) and mr_{EEC} equals mr_{UK} . If it is assumed now that the United Kingdom enters the European Common Market and her duty is raised to the EEC level, the new equilibrium position will be such that total exports of Argentina will decrease to x^1 . The increased level of protectionism in the U.K. provides an incentive to increase production and decrease consumption with a tendency towards a higher degree of self-sufficiency. Imports in this country become equal to zero, producing a

diversion of Argentine exports to the "old" EEC countries which increase from x_{EEC}^0 to x_{EEC}^1 . Assuming an EEC "ad valorem" duty, the level of imports in these countries increases, although at the expense of a lower price for Argentine exports and domestic EEC prices. This might not be the case with the utilization of variable levies in EEC countries. Under this circumstance U.K. imports also would be curtailed, but the height of the variable levies would increase to the extent that domestic prices could be held at the intervention levels determined by the EEC Commission. The use of this measure would allow for no additional imports into these countries and Argentine prices and exports would tend to decline.

CHAPTER V

FRAMEWORK FOR QUANTIFICATION

The Mathematical Model

The theoretical framework developed for the analysis of the effects of adopting alternative economic policies can be made operational through adequate mathematical and programming formulation. These formulations became possible after Paul Samuelson's pioneering research. He converted the theoretical problem of simultaneously solving for production, consumption, prices and trade flows among regions into a maximization problem, starting by defining an excess demand function for each region as the area which could be related to the notion of consumer surplus. However, he preferred to avoid labeling this algebraic area as such (due to the strong connotations that this concept has in economics) and named it as "social payoff function." He proceeded then to define a "net social pay-off function" (NSP) as the sum of the social pay-off functions of all the regions involved minus the transport costs involved in shipping the homogeneous commodity from one region to the other. Given that these are integrable functions, their areas can be maximized.

Assuming a simplified model of two regions with demand and supply functions represented by

$$d_i = \alpha_i + \beta_i p_i ; \quad \beta < 0, i = 1, 2 \quad (1)$$

$$s_j = \theta_j + \gamma_j p_j ; \quad \gamma > 0, j = 1, 2 \quad (2)$$

$$\sum_{i=1}^2 d_i = \sum_{j=1}^2 s_j \quad (3)$$

where

d_i = quantity consumed of beef in Tm. of e.c.w.

s_j = quantity slaughtered of beef in Tm. of e.c.w.

p_i and p_j = price of beef in deflated US\$ per Tm.
of E.C.W. at the producer level.

The net social payoff function to be maximized could then be expressed in terms of demand and supply functions and areas as¹

¹This expression can be derived from (1) and (2) in the following manner:

$$\text{For } d_i = \alpha_i - \beta_i p_i ; \quad i = 1, 2$$

$$\frac{d_i}{\beta_i} = \frac{\alpha_i}{\beta_i} - p_i$$

$$\frac{x_{ij}}{\beta_i} = \frac{\alpha_i}{\beta_i} - p_i$$

$$p_i = \frac{\alpha_i}{\beta_i} - \frac{1}{\beta_i} x_{ij}$$

$$\begin{aligned}
NSP = & \sum_i \int_0^{\sum_j} x_{ij} (\lambda_i - w_i \sum_j x_{ij}) d(\sum_j x_{ij}) \\
& - \sum_j \int_0^{\sum_i} x_{ij} (\mu_j + \eta_j \sum_i x_{ij}) d(\sum_i x_{ij}) \\
& - \sum_i \sum_j t_{ij} x_{ij}
\end{aligned}$$

where x_{ij} represents the non-negative flow activities between the supply and demand points, the first term of the right hand side is the sum of the algebraic areas under the demand functions, the second the sum of the areas above the supply functions and the last one the total transfer costs. Since the purpose is to measure the gains

$$p_i = \lambda_i - w_i x_{ij}$$

Similarly $s_j = \theta_j + \gamma_j p_j; \quad j = 1, 2$

$$x_{ij} = \theta_j + \gamma_j p_j$$

$$\frac{x_{ij}}{\gamma_j} = \frac{\theta_j}{\gamma_j} + p_j$$

$$p_j = -\frac{\theta_j}{\gamma_j} + \frac{1}{\gamma_j} x_{ij}$$

$$p_j = \mu_j + \eta_j x_{ij}$$

from trade, the concern refers to the excess demand or supply functions that result of the difference between domestic demand and supply.

Samuelson suggested that the maximization of the NSP function might be achieved by trial and error or by a more systematic procedure of varying exports in the direction that would increase the value for the function.

His formulation provided the basis for several interregional competition studies and for the elaboration of new computational algorithms. A parametric and iterative procedure proposed by Judge and Wallace and reactive programming by Tramel and Seale are indicative of the latter. More recently Takayama and Judge¹ converted Samuelson's formulation into a quadratic programming problem by postulating linear dependencies between regional supplies, demand, and prices. Using regional and demand equations as set up in (1) and (2), they wrote Samuelson's problem of maximizing the net social payoff function as one of maximizing (4). Evaluation (4) the problem could be written as one of maximizing

$$f(x) = \sum_i \lambda_i \sum_j x_{ij} - \frac{1}{2} \sum_i w_i (\sum_j x_{ij})^2 - \sum_j \mu_j \sum_i x_{ij} \\ - \frac{1}{2} \sum_j \eta_j (\sum_i x_{ij})^2 - \sum_i \sum_j t_{ij} x_{ij} - \sum_i a_i \quad (5)$$

¹"Spatial Equilibrium and Quadratic Programming," Journal of Farm Economics, Vol. 46 (February, 1964), 67-93.

Two conditions were then necessary to maximize this concave quadratic function in terms of nonnegative x_{ij} :

$$\frac{\partial f(x)}{\partial x_{ij}} = \lambda_i - w_i (\sum_j x_{ij}) - \mu_j - \eta_j (\sum_i x_{ij}) - t_{ij} \leq 0 \quad (6)$$

and

$$\frac{\partial f(x)}{\partial x_{ij}} x_{ij} = 0 \quad (7)$$

Given that in (6)

$$\lambda_i - w_i \sum_j x_{ij} = p_i$$

and

$$\mu_j + \eta_j \sum_i x_{ij} = p_j$$

condition (6) can be rewritten as

$$p_i - p_j \leq t_{ij} \quad (8)$$

The economic interpretation of these conditions was explained in Chapter IV.

After demonstrating that Samuelson's formulation could be converted into that of maximizing a quadratic function subject to linear constraints, the same writers specified a computational algorithm that obtains a direct and efficient solution for regional prices, quantities and inter-regional flows.

Finally, D. Lee Bawden picked up the thread laid by Takayama and Judge and showed how, with some simple modifications, spatial models could be extended from the field of interregional economics to international trade problems. He explained how to incorporate trade barriers and other policy instruments, such as price supports and acreage allotments, within the constraints that may affect the solution. The importance of this contribution is obvious for this study since it relies very heavily upon the effects derived from the application of these policy tools.

The availability of a quadratic programming formulation at Michigan State University made such a model useful to this research. QUADA (the name of the program) is a FORTRAN program developed by Dr. Richard G. Heifner¹ for solving quadratic programming problems using the algorithm proposed by Philip Wolfe.²

Data Requirements

This section will be subdivided into six subsections which will deal with the general assumptions of the model, the estimation of demand functions, supply functions, excess demand functions, matrix of transfer costs, and selection of policy instruments.

¹Richard E. Heifner, "Determining Efficient Seasonal Grain Inventories: An Application of Quadratic Programming," Journal of Farm Economics, Vol. 48, No. 3, Part I (August, 1966), 648-660.

²Philip Wolfe, Econometrica, Vol. 27 (July, 1959), 382-398.

General Assumptions

In Chapter I the world was divided into 15 regions (numbered from 1 to 15), including Argentina, Belgium-Luxembourg, France, Germany, Italy, the Netherlands, the United Kingdom, the United States, Australia, New Zealand, Ireland, Denmark, the rest of Latin America, Canada, and the rest of the World. The inclusion of the first six regions is obvious due to the nature of the research. The United Kingdom and the United States were taken into account because of their importance in the world market and to Argentina. The countries combined represent 63.6, 60.9 and 49.8 per cent of the total world imports for the periods 1956-60, 1963, and 1964 respectively, as can be seen in Table V-1. Furthermore, the United Kingdom has been the single most important outlet for Argentine exports for several decades. Argentines are closely observing the evolution of the United States market because of its potential.

On the exporting side, Australia, New Zealand, Denmark, and Ireland are Argentina's most important competitors. The most important market for Australia and New Zealand is the United States, but Argentine failures to meet quantities demanded by the Six in some years, as well as depressed prices in the United States, have helped divert their supplies towards the EEC. Substantial increases in the supply of exports of Oceania, combined with import restrictions in the United States, might provide additional

TABLE V-1.--Beef and Veal:^a Major Exporting and Importing Countries, Trade and Per Cent of Total Trade, Average 1956-60, Annual 1963 and 1964.

Countries	Quantity				Per Cent of Total			
	Average 1956-60		Average 1963 ^b		Average 1956-60		1963 ^b	
	Mil. lb.	Mil. lb.	Mil. lb.	Mil. lb.	Per Cent	Per Cent	Per Cent	Per Cent
Exporting Countries:								
Argentina	1,206.9	1,600.1	1,194.6		37.0		30.5	26.1
Australia	549.3	932.5	1,009.5		16.9		17.8	22.0
New Zealand	317.7	400.1	373.0		9.8		7.6	8.2
Uruguay	128.8	213.6	322.0		4.0		4.1	7.0
France	89.1	264.6	199.1		2.7		5.1	4.4
Netherlands	62.1	155.7	193.1		1.9		3.0	4.2
Yugoslavia	46.7	183.1	178.9		1.4		3.5	3.9
Denmark	167.6	241.4	170.2		5.1		4.6	3.7
Ireland	106.8	197.1	154.3		3.3		3.8	3.4
USSR (Europe & Asia)	172.8	411.2	138.0		5.3		7.9	3.0
Brazil	91.2	54.8	75.3		2.8		1.0	1.6
Mexico	52.9	101.9	71.1		1.6		1.9	1.6
United States	60.2	33.0	66.0		1.8		0.6	1.4
South Africa, Rep. of.	19.7	54.4	62.6		0.6		1.0	1.4
Poland	1.0	59.5	53.7		c		1.1	1.2
Paraguay	31.8	44.1	48.5		1.0		0.8	1.1
Canada	38.8	25.6	42.8		1.2		0.5	0.9
Other	116.1	271.2	225.6		3.6		5.2	4.9
Total 46 Countries	3,259.5	5,243.9	4,578.3		100.00		100.0	100.0
Importing Countries:								
United Kingdom	1,352.6	1,156.3	1,133.1		42.5		24.9	25.4
United States	671.0	1,677.0	1,085.0		21.1		36.0	24.4
Italy	224.0	570.1	625.9		7.0		12.2	14.1
Germany, West	127.2	238.9	313.1		4.0		5.1	7.0
USSR (Europe & Asia)	282.5	59.5	212.2		8.9		1.3	4.8
France	62.3	86.0	175.2		1.9		1.8	3.9
Switzerland	18.5	44.6	83.5		0.6		1.0	1.9
Netherlands	34.9	41.0	81.1		1.1		0.9	1.8
Greece	18.2	77.7	65.4		0.6		1.7	1.5
Belgium-Luxemburg	24.1	45.8	57.1		0.8		1.0	1.3
Spain	50.6	189.0	49.9		1.6		4.1	1.1
Canada	53.4	63.8	47.8		1.7		1.4	1.1
Other	259.4	402.9	521.6		8.2		8.6	11.7
Total 46 Countries	3,178.7	4,652.6	4,450.9		100.0		100.0	100.0

^a Carcass Weight Equivalent (CWE) basis; excludes offals, animal fats, and live animals.

^b Provisional.

^c Less than 0.05 per cent.

SOURCE: U.S.D.A. - Foreign Agricultural Service, World Beef Trends, FAS-M-173-Washington, June 1966, p. 9.

incentives for them to direct their efforts to the main Argentine outlets. Ireland and Denmark are important exporters and have favorable distances to the Western European markets and are thus deserving of our attention. Finally, the remaining regions are included to complete the model.

Each region is assumed to concentrate her production at one point and her consumption at another, although they may be the same in certain cases. The main criterion chosen to select the points of Table V-2 was to single out those cities or towns around which most of the production or consumption of the region took place. In those cases where several geographic areas were important within a region, a compromise point was adopted which would be relatively equidistant from the major subregions. The motivation that induced to the adoption of this criterion was the belief that the most important aspect to be considered was that of transfer costs, where distance was supposed to be a major determining factor.

Using concentration points may be very easily criticized as being highly unrealistic. However, the lack of reality can be diminished to a great extent if relatively small regions are delineated and the importance of transfer costs is not overwhelming in the overall phenomena of resource allocation and pricing. This is thought to be the case since for all the important trading regions included in the model production and consumption are pretty much concentrated

TABLE V-2.--Division of the World into 15 Regions and Corresponding Production, Exporting, Importing and Consumption Points.

Region Number	Region Name	Production Point	Export Port	Import Port	Consumption Point
1	Argentina	Lincoln (BA)	B. Aires	B. Aires	B. Aires
2	Belg.-Luxemburg	Brussels	Antwerp	Antwerp	Brussels
3	France	Lyon	Le Havre	Le Havre	Paris
4	Germany	Munich	Hamburg	Hamburg	Duisburg
5	Italy	Milan	Genova	Genova	Milan
6	Netherlands	Amsterdam	Amsterdam	Amsterdam	Amsterdam
7	U. Kingdom	Liverpool	Liverpool	London	London
8	U. S. A.	Omaha	New York	New York	New York
9	Australia	Sidney	Sidney	Sidney	Sidney
10	New Zealand	Auckland	Auckland	Auckland	Wellington
11	Ireland	Luimneach	Dublin	Dublin	Dublin
12	Denmark	Copenhagen	Copenhagen	Copenhagen	Copenhagen
13	Rest of L. Am.	Rio Janeiro	Rio Janeiro	Rio Janeiro	Rio Janeiro
14	Canada	Winnipeg	Toronto	Montreal	Montreal
15	Rest of the World	(1)	(1)	(1)	(1)

(1) Given the tremendous extension of the region and the many points which are important according to each country, several points were used. In other words, several routes were used to connect this region with any one of the remaining regions of the model.

around particular points, except in the United States. Also, the use of import duties, variable levies, price supports, quotas, etc., determines that, although transfer costs are important to the model errors of a few dollars, choosing one point rather than other within a country may not be critical to the results of the model.

The simplification introduced by selecting one point for consumption and another for production tends to decline as the regions become smaller. It would be desirable to design a model which splits the world into a fairly large number of regions. The main restriction lies in computer capacity and the lack of good quality data at a very disaggregate level. The first aspect can be partially solved with the preparation of computer programs for spatial equilibrium models which allow for dumping the data on tapes and calling it back when needed, but a limit on the number of regions and constraints that can be handled is very easily reached when extending the model. The limitations of computer memory and program capability were a major factor in determining the number of regions for this study. It is felt that this number is large enough to avoid important distortions.

Each of the regions is represented by a demand and a supply function from which a demand for imports will be derived. Their peculiarities will be analyzed in the next section.

The regions are separated, but not isolated, by a physical unit transfer cost made up of transportation, handling, and insurance costs. Comments on these will also be made later.

Firms and state trading agencies are profit maximizers and consequently make shipment decisions which yield the greatest per unit return. Accordingly there can be no product cross-hauling. Also related is a perfect knowledge of profit opportunities. None of these assumptions is probably very far removed from the actual world. Exporters and importers operate on a highly commercialized basis, making use of modern communication methods which allow them to be aware of changes in the most important markets of the world.

Models of this type usually assume that the product is homogeneous and that consumers are indifferent about the source of supply. The violation of this assumption for this case would have introduced some important distortions in the results. Beef trade is made up of several different qualities which also bring different prices. Fresh, chilled, and frozen beef, which are all encompassed in the number 011.1 of the SITC (revised 1961) point out a range of qualities and prices in a descending order. Trade of other products such as canned beef was also included in the model. The distortions introduced by putting all these products into an homogeneous group were avoided to a large

extent by using coefficients which take into account the value of one type of product in relation to the other.¹

To avoid the errors committed in dealing with trade of 011.1 with trade of canned beef that have widely different prices, account was taken of the less important canned beef by estimating its future imports and exports outside the model and modifying the linear portions of the excess demand functions of each region. The changes in the allocation of production, consumption, and trade in each alternative analyzed affected the 011.1 category of the SITC (revised 1961) and the total (production, consumption, and trade of canned beef were considered fixed for all runs).

Estimation of Demand Functions

A demand function will be estimated for 9 of the 15 regions. Those selected for this purpose, regions 1 to 9, are the most important for analysis. For the remaining, a point estimation of consumption will be made dependent upon the year and alternative assumptions with which the analysis is concerned. Their estimation will be shown in Chapter VI.

A restriction is imposed upon the functional form. The quadratic programming nature of the formulation requires linear relationships between the dependent and the independent variables, the reason being that the objective function

¹The coefficients used were:
 (a) 0.85 (Price 1 tm.chilled beef) = Price of 1 tm.
 fresh beef
 (b) 0.81 (Price 1 Ym.frozen beef) - Price of 1 tm.
 fresh beef

to be maximized or minimized is quadratic and that this function is raised to the second power only after integrating the area under the demand functions. The empirical evidence obtained on the basis of different forms in the past leads one to believe that the linearity restriction is not a very serious one, at least within the observation inferals. The results obtained with the two functional forms have not been different enough to rule out this useful formulation.

Two other requirements are that all the demand and supply functions, as well as the transfer costs, be expressed in the same currency, and that all prices be expressed at the same marketing level for a meaningful equilibrium. The currency requirement will be met by choosing the United States dollar due to its stability, worldwide recognition, and data availability. The producer level was chosen to satisfy the latter requirement because of data availability.

The last general requirement is that all demand and supply functions be expressed in terms of homogeneous quantities of beef. The unit chosen was metric tons of equivalent carcass weight.

The first steps were to collect previous estimates that satisfied the requirements. It was thought that available estimates would provide many of the needed demand functions, but the transformations and assumptions needed to derive usable estimates were so many and so great that direct estimates were used.

The single equation approach was used to estimate the domestic demand function of each region. The Takajama-Judge model requires for quantities to be expressed as a function of prices and this implies no contradiction with the theory developed by Cournot and Marshall and the estimation procedures most usually followed. Besides these the conditions mentioned by Héctor Dieguez¹ to advocate for estimating demand functions using a single-equation approach where quantity is the dependent variable and prices the independent ones are satisfactorily met for almost all the regions of the model. He explains the properness of using the described procedure when the commodity is traded with other countries, the international price is independent of the country exports and the exchange rate is fixed during the sampling period. The restriction of the exchange rate can be relaxed if its variation is independent of the exports volume. Under these circumstances domestic prices are the exogenous variable and quantities domestically consumed can be considered as the dependent variable. Such assumptions are fairly well met for the regions of the model. The countries for which demand functions were estimated are important traders, price takers by and large, and with fairly stable exchange rates. Argentina is probably the country for which these conditions are not so

¹Héctor L. Dieguez, Un ejercicio en torno a los problemas de multicolinealidad y autocorrelación, Instituto Torcuato Di Tella, Mimeo N° 48 of the CIE, Enero 1968, pp. 22-23.

strictly satisfied mainly regarding the last requirement. Nonetheless the importance of the other factors previously mentioned and of the possibility of thinking of exchange rate fluctuations as independent of beef export variability inclines one to adopt the general formulation.

The starting general formulation used was:

$$d_{i,t} = a_i + b_{1i} pc_{i,t} + b_{2i} ppk_{i,t} + b_{3i} ps_{i,t} + \\ + b_{4i} ppy_{i,t} + b_{5i} y_{i,t} + u_{it}$$

for $i = 1, 2, \dots, 9$

and $t = 1950, 1951 \dots, 1966$

where:

- d = consumption of beef in thousand Tm. of equivalent carcass weight
- pc = average price of cattle per liveweight Tm. received by the producer in real US\$ of 1965.
- ppk = average price of hogs per liveweight Tm. received by the producer in real US\$ of 1965.
- ps = average price of sheep per liveweight Tm. received by the producer in real US\$ of 1965.
- ppy = average price of poultry per liveweight Tm. received by the producer in real US\$ of 1965.
- y = total gross national product in millions of real US\$ of 1965.

With such a large number of demand functions to estimate for different countries the achievement of complete homogeneity was impossible. Fortunately the problem was less acute for cattle prices. Prices at the producer level for

beef substitutes were not obtained in some cases, but for the two most important variables, prices of cattle and income, the homogeneity of data was very acceptable. The results obtained are condensed in Table V-3 which follows.

All the direct price and income coefficients were highly significant except for the price coefficient of the equation for the United Kingdom. The indirect price coefficients were not so meaningful. The coefficients of multiple determination were rather high, except for the United Kingdom and Australia. The only case in which serial correlation was verified was for France. The income elasticities were usually in agreement with those of other studies, although the research efforts regarding demand usually refer to the retailer stage. The unique estimates of income elasticities which notably differ from those commonly observed are for Argentina and the United States. The surprisingly high "income" elasticity obtained for Argentina (0.76) suggested a second trial using per capita domestic product rather than total gross domestic product, with the expected result according to previous studies:

$$d_1 = 71.938 - 0.171 \text{ pc} + 0.056 \text{ ppk} + 0.035 \text{ 6};$$

$$(3.37) \quad (-7.50) \quad (1.29) \quad (0.97)$$

$$R^2 = 0.86$$

$$DW = 1.78$$

that is, a low "income elasticity" (p.25).

TABLE V-3.--Summary of Demand Equations to Use in the Spatial Equilibrium Model.

Region Name	a	b ₁	b ₂	b ₃	b ₄	b ₅	R ²	DW d	Test ^a Res.	Ey ^b	Ed,pc ^b	Ed, ^b ppk	Ed, ^b ps	Ed, ^b ppy	MKTG ^c STAGE
Argentina	501.651 (1.64)	-1.487 (-5.17)	1.392 (1.35)			0.108 (4.22)	0.68	1.78	NSC	0.76	-0.28	0.21			Pr
Belgium	199.971 (6.47)	-0.200 (-321)				0.009 (6.92)	0.77	0.97	IND	0.57	-0.58				Pr
France	869.817 (3.42)	-0.985 (-2.00)	0.516 (1.22)		-0.183 (-2.07)	0.013 (5.64)	0.95	0.50	SC	0.62	-0.32	0.20		-0.16	Pr
Germany	1815.911 (3.60)	-1.262 (-2.28)	-1.060 (-2.30)			8.805 (7.86)	0.94	1.14	IND	0.61	-0.75	-0.70			Pr
Italy	552.815 (4.71)	-0.811 (-3.42)				0.016 (12.71)	0.95	1.25	IND	0.90	-0.77				Pr
Netherlands	333.498 (15.87)	-0.511 (-10.61)				11.328 (18.99)	0.96	2.86	NSC	0.67	-1.36				Pr
U. Kingdom	2075.80 (2.00)	-2.700 (-1.25)				4.858 (2.46)	0.43	1.17	IND	0.39	-1.03				Wh
U. S. A.	3322.983 (7.69)	-4.662 (-9.20)				11.949 (23.90)	0.99	1.50	NSC	0.85	-0.32				Pr
Australia	466.539 (4.90)	-0.429 (-2.38)		0.162 (1.13)		0.007 (2.11)	0.30	0.86	IND	0.25	-0.40		0.17		Wh

^aNSC, IND, and SC respectively mean no serial correlation, indeterminate, and serial correlation.

^bCalculated at the means.

^cThis column reports the marketing stage at which the function was estimated; producer or wholesaler. Adjustments were made to the regression coefficients of price of cattle of U. K. and Australia to make them homogeneous to those of the remaining regions that were estimated at the producer level.

-The figures in parenthesis below the regression coefficients are the t values.

The direct and indirect price elasticities showed a slight variation when the formulation was changed: -0.27 and 0.17 respectively. The difference in "income" elasticities between the formulations suggests that the population effect included in the equation in Table V-3 is much stronger than that produced by changes in the gross domestic product. It also is interesting to observe that for Argentina, while most direct price elasticities calculated at the retail level are around 0.45 , the estimate obtained here at the producer level is about 0.27 . The lower elasticity at the producer level than at the retailer stage suggests the existence of constant absolute margins. Most of the estimates obtained for the remaining countries also reflected lower levels than estimates obtained in previous studies at retail or wholesale stages.

Estimation of Supply Functions

Similar to the demand functions, estimating the supply relationship covered 9 of the 15 regions, and point estimates were to be calculated for the remaining regions. Similar restrictions to those affecting the calculation of demand functions applied here.

From the point of view of available estimations there was a considerable difference between demand and supply functions. The supply number is indeed small, and almost without exception, substantial transformations would have been required to adapt them to the needs of the present

study. The long-run elasticity obtained by Beker¹ at the wholesale level is 0.06, but the regression coefficient is not significant at a meaningful level. Otrera's² long-run estimate, also for Argentina, is -2.48 and from a theoretical point of view is unacceptable.

Gustavo Nores³ estimated four different price elasticities of supply: two of them refer to live animals; the third is a short-run elasticity and the remaining one, which would properly fit this study (because it refers to slaughter quantities and is a cumulative elasticity), -0.31, was not accepted; like Otrera's estimate because of its negative sign.

The short-run estimate developed for the Netherlands by the Landbouw-Economisch Institut⁴ for calves is -0.2489 at the producer level; Grün⁵ also obtained a short-run

¹Victor A Beker, Elasticidades de Oferta en la producción Agropecuaria Argentina: 1935-65, Facultad Ciencias Económicas (B. Aires: 1968).

²Wylliam R. Otrera, An Econometric Model for Analyzing Argentine Beef Exports Potentials (unpublished Ph.D. dissertation, Texas A. & M. University, May 1966).

³An Econometric Model of the Argentine Beef-cattle Economy (unpublished Master's Thesis, Purdue University, June, 1969).

⁴Supply and Demand, Imports and Exports of Selected Agricultural Products in the Netherlands, Landbouw-Economisch Institut, The Hague, 1967.

⁵F. H. Grün, and others, Australia: Long Term Projections of Agricultural Supply and Demand, 1965 and 1980, S. Monsen, Jerusalem, May 1968.

estimate (0.162 at the producer level); Cromarty¹ a long-run estimate of beef production for the United States (not of slaughterings) of 0.17; and two studies, one of Jones,² and the other Clark³ for the United Kingdom were closer to the needs of this model, given that long-run estimates of beef were calculated, but at the wholesale level (1.0 and 0.75 respectively).

It was decided that a better approach would be to estimate directly the required supply functions.

One of the first observations of the behavior of slaughtered quantities in response to price changes was that lagged prices seemed to affect the volume slaughtered in a given year more than present prices. Table V-4 is a summary of several trials made with quantities of beef slaughtered in year t as the dependent variable and price of beef of year t as the unique dependent variable; using the same dependent variable, but with price of beef lagged one year in a second trial, and so forth.

¹William Cromarty, Predicting the Impact of Alternative Government Programs on the Wheat and Feed Livestock Economies, Michigan State University--Agricultural Experimental Station, Technical Bulletin 286, 1962.

²G. T. Jones, "The Response of the Supply of Agricultural Products in the U.K. to Price," The Farm Economist, Vol. IX, No. 12, 1961, 2nd Vol. X, No. 1, 1962.

³Colin Clark, United Kingdom: Projected Level of Demand, Supply and Imports of Agricultural Products, 1970, 1975 and 1980, Publication Services Division of the Israel Program for Scientific Translation (Jerusalem: December 1969).

TABLE V-4.--Influence of Present and Lagged Prices of Cattle Upon Slaughtering Ranked in a Descending Order.

Region Name	t	t-1	t-2	t-3	t-4	"Price Elast." Range	Prices Used
Argentina	3	5	4	1	2	0.10 - 0.26	defl.mn\$
Belgium	4	2	1	3		0.17 - 0.30	curr.US\$
France	3	4	2	1		0.53 - 0.59	defl.US\$
Germany	3	4	2	1		1.33 - 1.82	defl.US\$
Italy	3	4	2	1		0.67 - 1.04	curr.US\$
Netherlands	3	1	2	4		0.51 - 0.81	defl.US\$
Australia	3	4	2	1		0.31 - 0.58	defl.US\$

The influence of prices upon quantity slaughtered is summarized by assigning a rank with number 1 to the variable exerting the greatest influence and so forth in a descending order. Observation of the data suggested adding one trial for prices lagged 4 years for the Argentine case.

A clear pattern seems to emerge from the above table. With some exceptions, prices lagged 3 and 2 years (3 and 4 for Argentina) showing more importance in determining slaughtering than present prices and prices lagged one year. In 5 out of the 7 cases prices lagged 3 years appeared to have the greatest impact upon slaughters. Also in 5 out of the 7, prices lagged 2 years showed a stronger influence than present prices.

The results obtained seem logical considering that the stock of animals a farmer may hold at a time period t cannot be produced in a short period of time, and that the number of animals he sends to slaughter is strongly related to the

number of animals he keeps on the farm. Present prices may affect the number and the weight of the animals within the range determined by the stock but these two variables seem to be less important than the stock itself. Because of these, some trials were made to include present and lagged prices as variables influencing present slaughter. The calculation of the Farrar and Glauber¹ test clearly indicated the existence of multicollinearity when present and lagged prices were simultaneously used as independent variables. Three procedures were then used as follows: The Nerlovian² approach in estimating long-run elasticities, a procedure which would arbitrarily weigh present and lagged prices to form an overall index that might reflect the influence of all price variables considered important, and the principal components approach which also uses an index of prices.

The first approach failed because of the negative response to changes in present prices verified for some of the countries of the model (Argentina, Belgium, Italy, and Netherlands). The negative coefficient obtained for present prices resulted (as a consequence of the manner of calculating the long-run elasticity of the Nerlovian approach) in

¹"Multicollinearity in Regression Analysis: The Problem Revisited," The Review of Economic and Statistics, February 1969.

²Marc Nerlove, "Distributed Lags and Estimation of Long-Run Supply and Demand Elasticities: Theoretical Considerations," Journal of Farm Economics, Vol. 40, No. 2, May 1958.

negative long-run elasticities unacceptable from a theoretical point of view.

The second approach consisted of assigning arbitrary weights to present and lagged prices in accordance with their importance observed in Table V-4. A process of trial and error, based on the weight modifications, with the objective of maximizing the coefficient of multiple determination and minimizing the standard deviations of the regression coefficients soon led to results similar to those obtained with the third approach, the use of principal components. Since the properties of the second method were even less certain than those of principal components, it was abandoned.

The principal components method was applied to data on prices of products which are substitute and complementary in beef production. Hog, sheep, grain, and milk prices were transformed into a principal components index. The analysis of the production structure in each country revealed the most appropriate prices. Finally, the index of lagged beef prices was computed, omitting explicit present prices because of the way in which solutions are obtained in the spatial equilibrium model adopted.

The quadratic model solves for present prices, among other variables. This posed an interesting problem since the demand relationships should only contemplate present prices as explicit variables. Encompassing present and

lagged prices in the index would have yielded a hybrid solution lacking usefulness. However, present prices could be left out and lagged prices of cattle grouped in a unique index. The solution could be reached by either of two procedures: (a) by projecting exogenously lagged prices to the years immediately before the year for which the spatial equilibrium model was to be solved, or (b) by running the model in a recursive fashion through which the price solutions obtained in one year would be used as input prices to build the principal component index to use to forecast solutions for the following year, and so forth until 1975. The index of cattle prices was then built using a model with characteristics of recursiveness.¹

Table V-5 presents the summary of the "best" supply equations obtained by separating present from lagged prices of cattle. Lagged prices were grouped by means of a principal components index, with the exception that the equation for Australia, where prices of cattle lagged 3 years, seemed to yield better results. Prices of milk, dairy products, and lamb were also subject to the same index construction.

The results are not acceptable, not only on the grounds of the observable coefficients and tests of the table, but also in terms of the considerable variability

¹The reformulation of the program used to solve the spatial equilibrium problem was not made because the supply equations estimated were not accepted as reliable. More on this will follow.

TABLE V-5.--Summary of "Best" Supply Equations Estimated for Regions 1 to 9.

Region Name	a	pc _t ^a	pcipc _{lag} ^b	pg _{t-1} ^c	pcipm ^d	pcipd ^e	pcipl ^f	R ²	d	DW ^g Res
Argentina	2189.979 (11.34)	-3.516 (-2.24)	3.987 (2.14)					0.34	0.96	INC
Belgium	469.532 (8.84)		0.672 (3.32)		-1.839 (-1.60)	-0.269 (-0.27)		0.88	2.46	NSC
France	745.439 (10.46)	-0.298 (-0.87)	2.078 (5.40)					0.91	0.94	INC
Germany	-798.023 (-2.53)	0.386 (0.61)	2.870 (3.21)					0.77	0.70	INC
Italy	1336.33 (2.96)		0.267 (0.47)	-9.177 (-3.20)				0.49	0.98	INC
Netherlands	-77.155 (-0.59)	0.179 (0.89)			3.082 (2.00)			0.38	0.86	INC
U. Kingdom	633.721 (1.63)		1.528 (2.07)	6.305 (2.60)			-1.359 (-4.42)	0.73	1.92	NSC
U. S. A.	19030.234 (11.95)	-11.957 (-4.91)	-1.811 (-1.35)	-72.312 (-8.10)				0.89	1.71	NSC
Australia	351.33 (2.83)		1.315 (3.97)					0.57	1.39	NSC

^apc_t = price of cattle of year t.

^bpcipc_{lag} = principal components index of prices of cattle lagged 1, 2, and 3 years.
The variable used for Australia was price of cattle lagged 3 years.

^cpg_{t-1} = price of grains lagged one year. It comprises wheat, barley, and rye for Italy; barley for the United Kingdom; and wheat for the United States.

^dpcipm = principal components index of prices of milk. It comprises prices of milk of years t up to t-3.

^epcipd = principal components index of price of dairy products. Same as above.

^fpcipl = principal components index of price of lamb. It comprises prices of lamb lagged 1, 2 and 3 years.

^gINC and NSC respectively mean inconclusive and no serial correlation.

of the coefficients as other variables entered or dropped into the formulation. The estimation of demand functions showed opposite characteristics: the coefficients tended to remain unaltered when a variable was added or eliminated from the original equation. Here the coefficients changed to such an extent that only a few of the equations were deemed reliable. The case of the Netherlands could be cited as an example, in that for some formulations the overall impact of price changes upon slaughtered quantities was approximately equal to -1 while for others it tended to be +1. This is the major defect of the used specification. Other problems which can be observed from the table, such as inconclusiveness of the Durbin-Watson test and the erroneous signs for the United States principal components index of cattle prices and for the Belgium index of milk prices are important, but are less impressive in the overall context than the mentioned characteristics.¹

The best results were on the United Kingdom, France, and Argentina. The signs of the coefficients are generally those predicted by theorization analysis of the sector; the R^2 was acceptable for two of them, the standard errors were sufficiently small in relation to the regression coefficients (except for present price of cattle of France), and the overall stability of the coefficients was reasonable. In

¹The magnitude of the negative feature explained could be much better analyzed by presenting the results on the various trials made but reasons of space precluded this detail.

spite of these outcomes, the efforts involved in the spatial equilibrium model and program were not justified in view of the fact that only three of the regions had supply equations which were relatively acceptable. Also, the equation for Argentina is unacceptable since the overall impact of present and past prices tend to outweigh each other and there is no other relevant independent variable. Consequently, the total package of supply relationships obtained was rejected.

The best route open was to evaluate the point estimates made by several previous studies and adopt those which appeared most reasonable in view of past and possible future performance. This was the procedure finally adopted. The data evaluated and the projections adopted are presented in Chapter VI where the data used is analyzed, and comments are made on the results obtained for each alternative run.

Estimation of Excess Demand Functions

Once the demand and supply functions corresponding to each region are available the derivation of excess demand functions is a simple algebraic exercise. The supply function is subtracted from the demand function and the resulting expression is called the excess demand function. The quantity demanded along the excess demand function will be positive, zero, or negative according to the level of domestic prices. If prices are low enough for a particular country, quantities demanded in excess of quantity domestically

supplied will be positive. There will be a higher price at which quantities demanded and supplied will be equal. And a higher price level at which quantities demanded in excess of quantity domestically supplied will be negative, or expressed in other terms, quantity supplied will be greater than quantity demanded. The quantities demanded for imports are positive, zero, and negative respectively for the three price levels.

The need to derive excess demand functions from the two sets of demand and supply functions, rather than using them directly, arises from the higher efficiency of this type of program.¹

The fact that point estimates are used instead of sloping supply functions for the first 9 regions, and that point estimates are used for both slaughter and consumption for the remaining 6 regions does not affect the concept of excess demand equations nor the operability of the program.

Their actual derivation will be shown for each run in Chapter VI.

Calculation of the Matrix of Transfer Costs

Spatial equilibrium models specifically take into account transfer costs between each possible pair of regions. Transportation costs are the most important items included as a component of the total cost of transferring one metric

¹This is explained in the article by Takayama and Judge previously cited.

ton of beef from the production to the export point of the exporting country, and from that point to the port of the importing country, finishing at the consumption point. The other costs are insurance during the voyage and handling charges for the commodity. No transfer costs were assumed within any specific region.

Tramel and Seale¹ discuss three ways of estimating transfer functions, namely: actual costs, regression estimates based on actual mileage, and regression estimates based on estimated air miles. The last procedure was excluded because a very large portion of the total transportation is maritime transportation. The use of the first two approaches, on the other hand, posed one of the hardest data collection problems of the model. There is no periodical publication concerning beef transportation costs, and even less available information for the other variables.

Besides the lack of secondary sources, several other problems became evident. Reliable estimates of ocean freight rates on the basis of regression analysis were impossible to obtain because of the many variables intervening in determining a rate (approximately 25 according to a mimeograph document in internal circulation in the U.S. Maritime Commission), the impossibility of singling

¹Thomas E. Tramel and A. D. Seale, "Estimation of Transfer Functions," Interregional Competition Research Methods, the Agricultural Policy Institute, North Carolina State Print Shop, pp. 175-177.

out any one of them as being notably more important than others, and again the lack of information at the international level.

The "a priori" theory that distance would be a variable highly correlated with the rates was modified. It explained some of the variations of the dependent variable, but not many. Many other factors such as the existence of conferences for a particular route, continuity and magnitude of the trade route, type of ships used, time of the year, and direction of the trip (inward or outward) tended to obscure the relationship between distance and freight rates.

The second problem was the impossibility of predicting future rates. No base existed as to the direction of freight rates. Examination of data at the United States Maritime Commission for recent years and interviews with knowledgeable men of the field gave no clue as to possible direction of the changes, if any. One possible outcome is the reduction in freight rates as ships of greater deadweight tonnage became available, but another also reasonable outcome is a rise in world trade greater than the total supply of deadweight tonnage. In other words, outward shift in the demand schedule for transportation is greater than the outward movement of the supply function.

The method finally adopted was a combination of the first two explained by Tramel and Seale, consisting of:

1. use actual freight rates for the most important beef routes. A United States government publication,¹ the file of the Federal U.S. Maritime Commission, and private sources² provided this information;

2. estimate transportation costs of the less important routes using the information by regressing it against distance. The limitation of this procedure has been discussed, but the reduced role played by those trade routes in world beef trade made their use less problematic;

3. use the limited available information on insurance and handling costs for all trade routes. Data on these variables was even more scarce than for the main component of transfer costs, but since they were less important, with respect to the final results, those available were also used for the remaining routes;

4. eliminate from the matrix of transfer costs the routes which registered no traffic in the past and that have a very slim chance of achieving any importance in the near future. This decision was based on two different points: lack of information and importance and reducing the use of unnecessary space in the computer memory.

¹Hearings before the select committee on small business, United States Senate, Expansion of Beef Exports (Washington, D.C.: U.S. Government Printing Office, 1965).

²Expresas Líneas Marítimas Argentinas (ELMA), Corporación Argentina de Productores de Carnes (CAP), Fairplay Shipping Journal, among others.

5. add to the figures of ocean transfer costs the estimates of inland costs necessary to reach export and import docks when the production and consumption points do not respectively coincide with them, and assume that no change is expected to 1975. The calculation of inland transportation costs was made on the basis of actual figures when available, and by means of regression analysis, that used in turn the actual data on costs and distances.

Table V-6 presents the final matrix of transfer costs derived with these procedures.

Selection of Policy Instruments

Data on policy instruments was obtained from many publications and interviews. Those corresponding to the trial problem to 1966 were the most important actually used during that year. Those selected to 1975 under several alternatives were based mainly on observation and evaluation of past and future events. The specific comments for each run are included in the corresponding section of data used of Chapter VI.

TABLE V-6.--Matrix of Transfer Costs of Beef. (in real US\$ of 1965 per Tn.)

Origin	Desti- nation)	Argentina	Belgium- Lux.	France	Germany	Italy	Netherlands	United Kingdom	U. S. A.	Australia	New Zealand	Ireland	Denmark	Rest of the L. A.	Canada	Rest of the World
Argentina																
Belgium-Lux.		0	102	102	103	81	103	99	b	0	0	0	0	a	a	a
France		0	18	18	17	27	0	0	0	0	0	0	0	0	0	0
Germany		0	0	0	25	13	23	68	0	0	0	0	0	0	0	a
Italy		0	0	0	0	0	0	0	0	0	0	0	0	0	0	a
Netherlands		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
U. Kingdom		0	13	23	14	27	0	82	0	0	0	0	0	0	0	a
U. S. A.		0	66	68	68	72	68	0	0	0	0	0	0	0	0	a
Australia		0	0	a	0	0	a	0	0	0	0	0	0	0	0	a
New Zealand		0	116	117	133	135	105	116	94	1	0	0	0	0	0	a
Ireland		0	120	120	122	111	109	119	91	0	0	0	0	0	0	a
Denmark		0	76	76	79	83	65	94	77	0	0	0	0	0	0	a
R. of the L. A.		0	0	13	64	75	70	80	71	0	0	0	0	0	0	a
Canada		0	86	95	95	69	77	77	75	0	0	0	0	0	0	a
Rest of the World		0	0	0	0	a	0	0	a	0	0	0	0	0	0	0

Notes: a - This route has been used in the model although no freight rate is quoted in the table. The corresponding rates were originally calculated but they have been excluded. Since they correspond to regions which are net importers and since the model has been formulated to work with excess demand functions, no possibility exists for them to appear as exporters. The solution adopted to avoid introducing distortions into the model was to calculate exogenously the magnitude of this traffic and to force it into the solution. This is why certain trade flows appear in the solution with no changes in magnitude regardless of the nature of the alternative variables considered in each run.

b - This route has been used in the model although no freight rate is quoted in the table. Since Argentine exports of 011.1 to the U. S. A. are banned, the only possible shipments consist of other beef exports. To avoid distortions in the model that could be introduced by allowing canned beef and cooked and frozen beef to be included, the approximate magnitude of the trade flow was calculated and forced into the model identically to that of the problem above. The specific method consists of subtracting the quantity in question from the linear portion of the excess demand function of the importing country and adding it up to the linear portion of the excess demand function of the exporting region. The trade flow is then taken into account in the solution as are any of the flows endogenous to the model.

0 = Route eliminated because of little importance.

CHAPTER VI

THE RESULTS

Test for 1966

The first trial was to evaluate the predictive capability of the model and of the data being handled. Since there is no possibility of using statistical tests to make inferences regarding the reliability of the results, the best test was a trial for a specific year judged to be normal. This meant that neither draughts nor production booms occurred, and that there was an absence of other phenomena such as wars, outbreak of foot and mouth disease, etc. The calendar year 1966 was chosen because it met these qualifications and at the same time was a relatively recent year.

Data Used

Gross national product and prices.--Actual gross national product and prices were used for each of regions 1 to 9 of the model and multiplied by their corresponding regression coefficients found in Chapter V, to be added to the original constant. Since the main purpose of the test was to find out the predictive capability of the model, under the assumption that the values of these variables

were correct, actual GNP's and prices for substitute goods in consumption were used. The GNP estimates for 1975 took 1966 as the base year for the projection.

Estimations of actual consumption in terms of equivalent carcass weight units were also used for the remaining 6 regions and a similar procedure was followed for actual slaughter for all regions.

The following describes the policy variables used as constraints for each of the regions.

Orientation prices for cattle.--Since for the year in question orientation prices had not been unified throughout the Community, an individual orientation price was used for each of the member countries according to the actual situation. The selected orientation price levels should have been those which corresponded to adult cattle at the producer level, because these were the prices used for estimating demand functions. Since the 1966 market prices very closely followed the orientation prices set up by the Council of Ministers, the price levels chosen for the level of orientation prices were the actual 1966 prices. In this way no distortions were introduced into the model by adopting an erroneous price level. And, since the market price so closely followed the orientation prices, there was no danger in choosing market price levels representing orientation prices. Average 1966 market prices for the 5 regions

corresponding to the Community were multiplied by 1.86^1 to express a price at the producer level in terms of equivalent carcass weight units.

Variable levies.--The variable levies used in the model were those necessary for market prices to reach the levels of orientation prices. This mechanism is similar to the real one because the objective is the same. The actual calculation and application of variable levies is different as seen in Chapter II; but for the purpose of the calculations of the effects of the levies, the procedure adopted is considered sufficient.

"Ad valorem" duties.--The level of EEC countries for imports from non-member countries was 20 per cent. Since 1966 was still included in the transition period, "ad valorem" duties were applied for imports among member countries also. The percentages that each of them applied differed, with Benelux countries using a 4.2, and West Germany Italy and France imposing 4.5, 6.3, and 8 per cent respectively.

¹The process followed to obtain the price levels adopted as orientation prices in the final solution was that of gradually approaching it by successive additions on the right hand sides of the constraints. The level of the levies was consequently increased to the point where solution prices matched orientation prices. This trial and error procedure was very tedious, but alternative procedures failed. The method suggested by Dr. D. Lee Bawden "A Spatial Price Equilibrium Model of International Trade," JFE, Vol. 48, No. 4, Part I, Nov. 1966, p. 867, did not give satisfactory results.

The duty applied by the United Kingdom to imports from non-member countries in the Commonwealth was 20 per cent, while free imports were allowed from Commonwealth members.

Fixed import duties.--The United States applied a fixed levy of US\$ 66 per Tm and Canada applied the same amount for British preferential and countries enjoying most favored nation treatment. The general levy in Canada was US\$ 176.

Export taxes.--The only countries which applied export taxes during 1966 were Argentina and New Zealand. The former applied a 6 per cent tax from January 1, 1966 to April 25, 1966 and a 3 per cent tax from April 26, 1966, to November 7, 1966, at which time they were eliminated. A weighted average of 3 per cent was used for the year. New Zealand, on the other hand, applied a fixed export tax of US\$ 1.50 per Tm.

Import taxes.--The only import quotas used were those applied by the United States for beef classified within the category 011.1 of the Standard International Trade Classification (SITC), revised 1961.

The quotas used here originate in the agreement signed during 1964 by the governments of Australia, New Zealand, the Irish Republic and Mexico to limit their meat exports to the United States. The quantities determined

for exports of 011.1 during 1966, in terms of product weight, were 260,000, 111,000, 36,000, and 31,800 respectively, which when converted into carcass weight equivalent, respectively became 356,200, 152,070, 49,320, and 43,566 Tm.

Bans on product imports within the 011.1 category from regions considered as endemically affected by foot and mouth disease was also taken into account.

The transfer cost data used for 1966 is shown in Table 6 in the previous chapter and deserves no additional comments.

The linear constraints considered marketing margins between the producer and exporter levels of the exporting countries so equilibrium could be possible in terms of producer levels on all regions of the model. Omission of this factor would have resulted in higher producer prices in the exporting countries, because marketing margins represent a cost which must be considered for each shipment. The effects of eliminating this margin are the same upon equilibrium prices as in omitting any others such as transfer costs. The margins calculated were 1.509, 0.986, 1.147, 1.224, 1.180 and 1.509 for Argentina, Australia, New Zealand, Ireland, Denmark, and the rest of Latin America, respectively.¹

¹Some differences may appear in the figures reported here as actual, mainly for consumption and net imports, due to the many inconsistencies in the data even in those countries which have the best statistical information.

Finally, account was taken of the price differences between fresh, chilled, and frozen beef. The values of i Tm of chilled and frozen beef were established as being equivalent to 85 and 81 per cent respectively of fresh beef. The reduction is due to the freezing process.

Results

Table VI-1 shows the actual and predicted prices, consumption and net imports of fresh, chilled, and frozen beef for a normal year. The table has been complemented with figures for Net Imports of Other Beef and Actual Slaughtering for a more complete picture of the balance between consumption and slaughter.¹

Attention should be given to the figures above the horizontal line and to the left of the vertical line (N.W. quadrant) to compare the predictive capability of the model. The remaining data (figures below the horizontal line and to the right of the vertical one) were given and therefore, no mistake could be made (if the program functions properly).

The overall performance of the model was very satisfactory regarding the variables mentioned. The deviations for the three variables were small in general, and only relatively unsatisfactory for levels of net imports of 011.1

¹The calculations were based on f.o.b. export values obtained from FAO Trade Yearbooks and from domestic prices all converted into US\$ per Tm. of equivalent carcass weight 1966. The percentage obtained for Argentina was adopted for the rest of Latin America on the grounds that Uruguay, an important exporter in the latter region, follows similar practices to Argentina.

TABLE VI-1.--Comparison of Actual and Predicted Prices, Consumption, and Net Imports of Beef Corresponding to the Code 011.1 of the SITC (Rev. 1961) for 1966.^a

Region	Prices		Consumption		Net Imports 011.1		Net Imports of Other Beef	Actual Slaughtered
	Actual	Predicted	Actual	Predicted	Actual	Predicted		
Argentina	370	348	1,735	1,733	-457	-459	-129	2,321
Belgium-Lux.	1,177	1,182	243	231	8	-4	2	233
France	1,040	1,041	1,660	1,677	-32	-15	-7	1,659
Germany	1,258	1,258	1,301	1,309	132	140	4	1,165
Italy	1,284	1,285	972	948	298	274	1	673
Netherlands	1,145	1,098	241	259	-25	-7	4	262
U. Kingdom	867	892	1,298	1,391	350	403	81	867
U.S.A.	879	868	9,885	9,809	452	376	87	9,346
Australia	553	528	457	475	-401	-383	-24	882
New Zealand	470	463	142	142	-142	-142	-16	300
Ireland	592	623	45	45	-76	-76	-14	135
Denmark	n.a.	613	98	98	-90	-90	-7	195
Rest of Latin Am.	n.a.	363	2,953	2,953	-150	-150	-39	3,142
Canada	n.a.	726	829	829	-25	-25	8	846
Rest of the World	n.a.	1,002	14,769	14,769	158	158	49	14,562
TOTALS			36,628	36,628				36,628

Note: ^aPrices and quantities are respectively expressed in constant US\$ of 1965 and thousand Tm. of e.c.w.t.

of the U.K. and the U.S. In the case of the U.K., the level of imports was overestimated by 53 thousand Tm. and in the other case there was an underestimation of 76 thousand Tm. No calculation of percentage deviations was made because they may induce erroneous assumptions. The most important evaluation of the difference should be made in absolute terms for the purposes of this study. The reason for these two relatively important deviations lies in the distribution of trade flows between both regions.

This problem originates in the manner in which exports of a particular region are distributed among various importers and can be seen by comparing the predicted trade distribution and the expected according to actual data.¹ From a comparison of Tables VI-2 and VI-3 it appears that the most important factor causing the distortion indicated for the U.K. and the U.S. is a shipment from New Zealand to the U.S. Table VI-2, depicting the "actual" distribution, shows that New Zealand shipped 27,058 and 89,917 Tm. to the U.K. and the U.S. respectively, while Table VI-3, which depicts the results of the trial problem, shows no shipment from New Zealand to the U.S. and an overestimation

¹Considerable time was spent elaborating the matrix for actual trade distribution for the data inconsistencies and because of the diversity of conversion coefficients to transform product weight into carcass weight. These coefficients vary from country to country and in some cases are not reported. Furthermore, the coefficient differs for each trade flow because of the quality differences of the shipments.

TABLE VI-2.--Actual^a Trade on 011.1 in 1966 (th. Tm. of e.c.w.t. 2nd real US\$ of 1965).

Origin	Desti- nation	Argentina	Belgium- Lux.	France	Germany	Italy	Netherlands	United Kingdom	U. S. A.	Australia	New Zealand	Ireland	Denmark	Rest of Latin Am.	Canada	Rest of the World	GROSS EXPORTS	REGIONAL PRICE
Argentina	..	..	10.4	7.9	39.3	69.3	14.7	136.1	..	..	..	..	..	21.4	..	140.2	433.4	370
Bel.-Lux.	..	..	..	0.1	1.2	1.3	4.8	..	..	..	..	..	..	..	..	..	7.4	1,177
France	..	..	1.4	..	67.4	1.1	4.6	..	..	..	..	..	..	..	..	19.1	93.5	1,040
Germany	..	..	..	..	..	3.6	..	..	..	..	..	..	..	..	..	..	3.6	1,258
Italy	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,288
Netherlands	..	..	1.9	2.3	4.5	50.6	..	0.9	..	..	..	..	..	..	..	2.6	62.9	1,462
U. S. A.	..	..	0.2	2.5	1.0	0.4	0.5	..	..	..	..	..	..	..	..	2.0	4.5	879
Australia	..	..	..	0.2	..	..	0.1	..	..	..	..	..	..	..	2.8	5.3	8.7	553
New Zealand	..	..	..	2.2	4.6	11.5	..	101.7	248.5	..	..	..	..	..	..	33.0	401.6	470
Ireland	..	..	..	0.7	0.8	..	..	27.1	89.9	..	..	..	..	..	..	22.3	140.7	592
Denmark	..	..	..	4.2	0.7	0.2	2.4	43.3	23.8	..	..	..	..	..	..	0.4	76.1	n.a.
Rest of the L. A.	..	..	2.1	6.5	2.0	45.2	4.0	0.8	..	..	..	..	..	..	..	31.2	89.6	n.a.
Canada	..	..	..	3.3	8.3	30.6	3.7	21.9	76.4	..	..	..	..	..	..	25.3	174.6	n.a.
Rest of the World	..	..	..	10.8	5.7	81.0	..	26.0	..	..	..	..	..	..	..	..	26.8	n.a.
GROSS IMPORTS	..	..	16.0	40.8	135.5	297.6	34.7	153.2	465.9	..	..	..	..	21.4	2.8	281.3	126.4	
NET IMPORTS	..	-433.4	8.6	-52.8	131.9	297.6 ^b	-28.2	146.8	457.2	-401.6	-140.7	-76.1	-89.6	-150.6	-24.0	154.9		

^aThe figures reported here are only the best estimates of actual data that could be obtained in e.c.w.t.
^bRead the last footnote of the text.

TABLE VI-1.--1966 Trial: Predicted Trade on Oil, 1^a and Regional Prices During 1966 (th. Tm. of oil, 1^a 2nd real US\$ of 1965.

Origin	Desti- nation)	Argentina	Belgium- Lux.	France	Germany	Italy	Netherlands	United Kingdom	U. S. A.	Australia	New Zealand	Ireland	Denmark	Rest of Latin Am.	Canada	Rest of the World	GROSS EXPORTS	REGIONAL PRICE
Argentina	-	..	..	7.9	59.8	95.9	14.7	114.6	..	..	..	..	..	21.4	..	140.4	458.6	348
Bel.-Lux.	..	..	..	0.1	..	..	4.8	..	..	..	..	..	..	..	..	..	4.9	1,182
France	..	..	..	..	..	31.9	..	..	..	..	..	..	..	..	..	19.1	55.5	1,041
Germany	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,258
Italy	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,285
Netherlands	..	..	..	2.3	39.4	..	..	..	..	..	..	..	..	..	..	..	41.7	1,098
U. Kingdom	..	..	..	2.5	..	..	0.5	..	..	..	..	..	..	..	..	..	1.1	82
U. S. A.	..	..	..	0.2	..	..	0.1	..	..	..	..	..	..	..	2.8	..	1.1	528
Australia	..	..	..	2.2	..	..	..	73.2	274.3	..	..	..	..	..	..	33.0	183.0	528
New Zealand	..	..	..	0.7	..	..	..	119.0	..	..	..	..	..	..	..	22.3	162.0	463
Ireland	..	..	..	4.2	..	..	2.4	67.4	..	..	..	..	..	..	..	76.0	76.0	613
Denmark	..	..	..	5.5	35.2	..	4.0	..	66.8	..	..	..	..	..	..	44.4	90.0	613
Rest of the L. A.	..	..	..	3.3	..	62.3	3.7	..	27.8	..	..	..	..	..	..	25.3	171.4	343
Rest of the World	..	..	..	10.8	5.7	81.8	..	26.0	..	..	..	..	..	..	..	..	27.8	786
GROSS IMPORTS	..	..	..	40.8	140.1	273.9	34.7	486.2	378.9	..	..	..	..	21.4	2.8	284.4	158.3	..
NET IMPORTS	..	-458.6	-4.6	-14.8	140.1	273.9	-7.0	403.2	375.8	-183.9	-142.0	-76.0	-90.0	-150.0	-25.0	158.0	..	..

^aThe prediction of net total imports for 1966 that would result by adding the results here presented to those of Other Beef are presented in Table I of the Appendix of this chapter.

of trade for the route New Zealand-U.K. This overestimation is approximately equal to the underestimation registered for the route New Zealand-U.S.

There were problems of distribution for other routes also, although of smaller importance. They can be observed in the last two mentioned tables for routes France-Germany, Denmark-Germany, Netherlands-Germany, Netherlands-Italy, and Denmark-Italy and other minor ones. The sensitivity of the model was high considering the quality of some of the data fed as constraints to the model. Transfer cost estimates in particular, are poor and lack of confidence in them perpetuates distrust of the predicted distribution. In some cases it was possible to substantially alter the flow matrix by simultaneously modifying the matrix of transfer costs for two or three routes by amounts not radically different from the error.

In summary, the overall results of the model are satisfactory regarding the level of prices, consumption and aggregate imports of each region; but considerable care should be used when evaluating the results insofar as the origin of the imports.

Basic Run for 1975

When the 1966 test was judged acceptable, the next step was preparation of the data to provide the basis for satisfying the second objective stated in the Introduction. An evaluation was made of those variables and their levels.

Because all remaining runs would be based on this 1975 run, considerable time will be devoted to the explanation of the data used and the results obtained. It also deserves special consideration because of the questions it answers.

Data Used

GNP Projections.--Three sets of GNP projections were made for regions 2 to 9. Table VI-4 presents the derived sets of GNP growth rates labeled as Unfavorable, Most Likely, and Favorable conditions. The titles were a function of the prospects for Argentine exports, in the sense that a high rate of GNP growth in regions 2-9 represents the possibility of high rates of beef absorption.¹

The GNP levels for each country were plotted against their corresponding years to observe whether any particular pattern was present throughout the period 1950-1966. Two functional forms were suggested by the plotting, linear and semilogarithmic, the former yielding the best results. It was observed that although the linear form provided a good fit, it was possible in some cases to obtain a better

¹This assumption may be controversial due to the positive correlation one may assume between rate of GNP growth and rate of beef growth slaughter, even in countries which are net importers. But it was appreciated nevertheless, in view of past events, that the correlation between increases in GNP and consumption was stronger than that between GNP and beef slaughters.

TABLE VI-4.--Alternative Sets of GNP Rates of Growth to Use for Projections of GNP to 1975.

Region	Unfavorable Conditions	Most Likely Conditions	Favorable Conditions
	(%)	(%)	(%)
Argentina	--	5.0	--
Belgium - Lux.	2.8	4.0	5.6
France	3.8	4.0	6.1
Germany	4.0	5.0	6.3
Italy	4.8	5.0	6.9
Netherlands	4.5	5.0	6.5
U. Kingdom	3.4	4.0	5.5
U. S. A.	3.0	4.0	5.1
Australia	3.9	5.0	5.8

relationship by dividing the period into two. This was very clear for the EEC countries, for example. The year 1958 for the Netherlands, 1959 for Germany and France, 1960 for Belgium and 1961 for Italy showed turning points in their rates of GNP growth. The linear relationship before and after those years was very good, but the rate of the former was somewhat lower than for the later period, very probably due to the creation of the Common Market after 1957. These turning points provided an opportunity to derive different rates of growth for those countries during the recent past, considering rates of growth which occurred after the formation of the Community, as favorable and the average rates throughout the period as unfavorable. The countries had recently proven they were able to grow from 1950 to 1966 at a relatively low average rate of growth, and from the end of the fifties until 1966 at a much faster rate. The possibility also existed of using

intermediate growth rates as an assumption of "Most Likely Conditions", in the sense that countries of the Community are beyond the verge of the preformation rates since the Common Market gave new life to their economies. On the other hand caution regarding the possibility of achieving the high rates observed during the post-formation period recommended the adoption of a middle rate as "Most Likely Conditions". Table VI-5 presents the functions estimated to derive the GNP rates of growth to use for projecting GNP to 1975 under alternative conditions.¹

No equations were included for region 1 in the last two tables because the projections used for Argentina for all the 1975 runs were those elaborated by INTA.² The unique projections used for regions other than those conformed by the EEC countries were presented under the Most Likely Conditions column of Table VI-4. The year 1966 was taken as the base to project GNP to 1975 under the alternative assumptions.

Projections of prices of products which are competitive in consumption with beef.--The demand equations estimated required price projections of only a very few competitive products: pork for regions 1, 3, and 4, sheep for

¹The actual projections used are shown in Tables 2-4 of the Appendix to this chapter.

²INSTITUTO NACIONAL DE TECNOLOGIA AGROPECUARIA, Argentina Supply and Demand Study, in preparation.

TABLE VI-5.--Functions Used to Project GNP to 1975 Under Alternative Conditions.^a

Region	Number of Observations	a	Regression Coefficient For Time (Years)	R ²
Belg.-Lux.	17 (1950-66)	8514.47 (20.05)	448.49 (10.82)	0.89
Belg.-Lux.	7 (1960-66)	10783.28 (36.06)	982.43 (14.69)	0.98
France	17 (1950-66)	32167.74 (12.34)	3505.08 (13.78)	0.93
France	8 (1959-66)	51324.04 (47.42)	6074.13 (28.33)	0.99
Germany	17 (1950-66)	17.10 (6.70)	5.64 (22.63)	0.97
Germany	8 (1959-66)	59.56 (37.80)	7.55 (24.21)	0.99
Italy	17 (1950-66)	10.20 (5.44)	2.65 (14.51)	0.93
Italy	6 (1961-66)	35.76 (37.48)	4.20 (17.16)	0.99
Netherlands	17 (1950-66)	4.17 (7.19)	0.82 (14.57)	0.93
Netherlands	9 (1958-66)	8.18 (18.22)	1.29 (16.20)	0.97
U. Kingdom	17 (1950-66)	52.93 (33.15)	4.32 (27.70)	0.98
U. S. A.	17 (1950-66)	332.78 (28.27)	20.15 (17.54)	0.95
Australia	18 (1950/51- 67/68)	7894.51 (16.70)	900.33 (20.21)	0.96
Australia	7 (1961/62- 67/68)	15861.29 (14.30)	1419.93 (4.04)	

^aThe dependent variable is gross national product expressed in millions of constant US\$ of 1965; the third column reflects the value of the constant and the fourth the value of the parameter corresponding to the time variable t, when t=1, 2...n.

region 9, and poultry for region 3. The fits obtained were much poorer than those used for GNP projections. Observations of the plotted data and of present events showed that prices would tend to remain at 1966 levels for pork in region 4 and sheep in region 9.

The final projections can be seen in Table 5 of the Appendix to this chapter.

Projections of consumption and slaughterings for regions 10 to 15.--The figures in Table VI-8 listed for regions 10-15 are point projections made for all 1975 runs. The reasons for including these regions and obtaining point estimates of their consumption and slaughter are that the model would be more complete with them, but at the same time they were not fundamental enough to justify the statistical estimation of their demand functions. It was recognized, nonetheless, that serious mistakes in the point estimates for regions 10 to 15 also might induce important mistakes in the results directly related to the objectives.

This recognition led to the evaluation of some of the studies referring to them. The main studies scrutinized were those published by FAD and OECD.¹ The results obtained were accepted for some regions and modified for others in light of outside evidence.

¹See note of Table VI-7.

TABLE VI-6.--Equations Used to Project Prices to 1975.^a

Region	Product	Number Of Years	Functional Form	a	Regression Coefficient For Time(yrs.)	R ²
Argentina	Pork	17	Linear	229.14 (18.19)	2.55 (2.07)	0.22
France	Pork	16	Linear	420.03 (20.35)	9.91 (4.64)	0.61
France	Poultry	17	Semilog.	1955.92 (10.57)	-426.67 (-4.88)	0.61

NOTE: ^aThe dependent variables are prices expressed in constant US\$ of 1965.

TABLE VI-7.--Comparison of Point Estimates of Consumption, Slaughtering and Net Imports of Beef of Regions 10 to 15 for 1975 Prepared by FAO and OECD.

Region	FAO Study			OECD Study		
	Slaught.	Consumpt.	Net. Imp.	Slaught.	Consumpt.	Net Imp.
N. Zeal.	403	154	- 249	419	151	- 268
Ireland	355	57	- 298	365	56	- 309
Denmark	315	110	- 205	210	99	- 111
R. L. Amer.	5,394	5,029	355	n.a.	n.a.	n.a.
Canada	1,060	939	- 121	1,003	1,027 ^a	24 ^a
R. of World	14,124	15,563	1,439	1,667 ^a	2,064 ^a	397 ^a

Sources: FAO, Agricultural Commodities - Projections for 1975 and 1985, Italy, 1967.

OECD, Agricultural Projections for 1975 and 1985, Paris, 1968.

NOTE:

^aThe OECD study does not present enough information for region 15 to be directly comparable to that of FAO because the former only includes information about Yugoslavia, Japan, Austria, Finland, Norway, Sweden, Switzerland, Greece, Portugal, Spain and Turkey.

It can be seen by comparing Tables VI-7 and VI-8, that the projections of FAO for New Zealand and Ireland were accepted, while those of OECD were more "reasonable" for Denmark and Canada. It should be noted that the OECD study took that of FAO as its starting point; it was in fact an evaluation of the latter in view of more recent evidence. The most important corrections made by OECD were those in reference to Denmark and Canada. The projection of Denmark slaughters was substantially reduced because of the negative impact she will probably suffer by 1975 because of the difficulties the EEC is suffering in its dairy policy. Denmark, as does the Six, has dual purpose animals, and her incentives to increase beef production will no longer exist because of the elimination of the benefits the EEC market provided in the past. The modified projections for Canada consisted of lower levels of production and higher levels of consumption.

None of the projections made for Rest of L. America and Rest of the World were accepted. The evolution of imports and exports from 1948 to 1966 of the former region seems to tell a very different story from that presented by the FAO projections. The historical record of imports and exports obtained from FAO Trade Yearbooks, suggested the convenience of using the same quantity of actual net imports registered during 1966 for 1975.

TABLE VI-8.--Point Projections to be Used for 1975 Runs^a (th. Tm. of e.c.w.t.).

Region Number	Consumption	Gross Imports of 011.1	Gross Exports of 011.1	Net Imports of 011.1	Net Imports of Other Beef	Total Net Imports	Slaughtering
Argentina	..	..	..	..	-229.7	..	2,860.0
Bel.-Lux.	..	..	..	..	2.7	..	275.0
France	..	..	..	..	- 10.4	..	2,135.0
Germany	..	..	..	..	5.8	..	1,453.0
Italy	..	..	..	..	1.0	..	710.0
Netherlands	..	..	..	..	5.2	..	383.0
U. Kingdom	..	..	..	..	120.0	..	1,028.0
U. S. A.	..	..	..	..	127.8	..	11,217.0
Australia	..	..	..	..	- 34.9	..	1,250.0
New Zealand	154	..	-225.4	-225.4	- 23.6	-249	403.0
Ireland	57	..	-277.3	-277.3	- 20.7	-298	355.0
Denmark	99	..	-100.7	-100.7	- 10.3	-111	210.0
R. of the L. A.	..	21.4	-153.4	-132.0	- 57.0	-189	..
Canada	1,027	2.8	- 11.2	- 8.4	32.4	24	1,003.0
Rest of the World	..	364.7	100.3	264.4	91.6	356	..

^a A few changes will be made on these estimates but they will be explicitly mentioned when necessary.

The OECD projections for some of the countries included in region omitted the Rest of the World were judged as satisfactory, but some changes were needed due to the problem explained in the note to Table VI-7. The FAO projection for this region was completely unacceptable because it included countries, such as Mainland China, as buyers of substantial quantities without acknowledging problems of purchasing power, balance of payments, and political problems which will very surely preclude them from becoming important traders.

Projections of slaughtering for regions 1 to 9.--As explained in Chapter V, the efforts to estimate supply functions failed to yield satisfactory results. Rather than use results in which little confidence could be put, a decision was made to obtain point estimates. The procedure was to select a series of important studies and to subject them to close scrutiny.

The following paragraphs will evaluate the factors that were used to adopt the quantities presented under study reference number 14 of Table VI-9 among the projections made by the studies 1 to 13.

Any projection which could be made for Argentina ran the serious risk of being highly arbitrary. The arbitrariness of a projection could be a characteristic common to many others, but this is particularly true for this case due to the fluctuations in the level of slaughter, the lack

TABLE VI-9.--Comparisons of Point Estimates of Slaughtering to 1975 of Regions 1 to 9 (th. Tm. of e.c.w.).

Reference Number of the Study	Argentina	Belgium Lux.	France	Germany	Italy	Netherlands	U. Kingdom	U. S. A.	Australia
1	2,942	265	1,940	1,320	660	320	1,015	10,460	1,250
2	3,020	275	2,100	1,340	710	335	1,065	10,780	1,300
3	..	250	2,135	1,341	667	383	..	..	..
4	2,057	..	..	..	..	..	..	..	..
5	..	241-245	..	..	..	..	..	..	..
6	..	..	2150-2300	..	..	..	..	..	..
7	..	..	..	1346-1453	..	..	..	..	..
8	..	..	..	..	860	..	..	..	..
9	..	..	..	..	..	313-317	..	..	..
10	..	..	..	..	..	..	1009-982	..	..
11	..	..	..	..	..	..	..	..	1,082
12	..	244	1,978	1,315	525	312	883	9,873	1,228
13	..	238	1,767	1,235	495	324	..	..	..
14	2,860	275	2,135	1,453	710	383	1,028	11,217	1,250

SOURCES: 1. FAO, Agricultural Commodities - Projections for 1975 and 1985, Rome, 1967; low estimates.

2. Ibid., high estimates.

3. Sorenson, Vernon L., and Hathaway, Dale E., The Grain-Livestock Economy and Trade Patterns of the European Economic Community with Projections to 1970 and 1975, East Lansing, USA, 1968.

4. Junta Nacional de Carnes - Consejo Nacional de Desarrollo de La Republica Argentina.

5. Studiecentrum Voor Economisch en Sociaal Onderzoek (SES0), Long Term Development of Supply and Demand for Agricultural Products in Belgium 1970-1975, 1967.

6. Centre de Recherches et de Documentation Sur La Consommation (CREDOC), Production and Uses of Selected Farm Products in France - Projections to 1970 and 1975, Jerusalem, 1967.

7. Institut Für Wirtschaftsforschung (IFO), Long-Term Development of Demand and Supply for Agricultural Products in the Federal Republic of Germany, München, 1967.

8. United States Department of Agriculture - Economic Research Service, Italian Agriculture - Projections of Supply and Demand in 1965, 1970, and 1975, Washington, 1964.

9. Landbouw - Economisch Instituut (Agricultural Economics Research Institute), Supply and Demand, Imports and Exports of Selected Agricultural Products in the Netherlands - Forecast for 1970 and 1975, 1967.

10. United States Department of Agriculture - Economic Research Service, Summary of United Kingdoms: Projected Level of Demand, Supply, and Imports of Agricultural Products, 1970, 1975, and 1980, ERS Foreign 248, Washington, July 1969.

11. Gruen, F. H., and others, Australia: Long Term Projections of Agricultural Supply and Demand, 1965 and 1980, S. Monson, Jerusalem, May 1968.

12. Organization for the European Cooperation and Development (OECD), Agricultural Projections for 1975 and 1985, Paris, 1968.

13. Institut Für Wirtschaftsforschung (IFO), Aggregation of Future Demand and Supply for Agricultural Products in the European Economic Community 1970 - 1975, Münden, 1960. The figures exclude carcass fats.

14. Estimates based on Studies 1 to 13, evaluation with respect to past and present levels of supply, statistical estimations of supply functions and projections for the corresponding variables, projections using time as independent variable, etc.

of reliable past studies, and the failures incurred by the author and by other studies. The level of slaughter for Argentina fluctuated between a low of 1,766 and a high of 2,605 thousand Tm. for 1953 and 1963 respectively, during the period 1950-1966. Since this study is, to a large extent, evaluating the prospects of EEC markets for 1975 assuming average levels of production for Argentina, the projection was made that Argentina would be able to increase production by at least 10 per cent over the 1963 level within a period of 12 years. If Argentina were incapable of producing an increased level of beef, the problem of future markets was not an important one. The problem becomes important when considering the possibility of selling greater amounts than in the past if the projection for higher production levels is a valid one. Lower supplies could have been projected in the face of extremely adverse conditions in world trade and prices for the year 1975. There was no need, however, to reevaluate the projection with a downward trend. And, in light of possible favorable world markets, the projections made by FAO appeared to be much more reasonable than those made by JUNTA DE CARNES and CONADE. Although, both FAO estimates seemed somewhat optimistic for average production conditions,¹ but one or more

¹The very large variations of Argentine slaughter do not preclude those figures as being a reality for a particular year. 1975 might be a year of peak slaughter and satisfy the high estimate of FAO or even surpass it, but the analysis performed here refers to average conditions.

runs could be made using FAO figures (or similar ones) in case of buoyant world markets and prices at the projected level of 2,860 thousand Tm. This quantity was chosen as the basic one together with the remaining "most likely conditions" that might prevail in 1975. In fact, two additional projections of slaughters higher than the basic one used for 1975 were made to analyze their effects.

For regions other than Argentina the level of the projections was influenced by a conservative principle. After evaluating the studies of the table in light of past and present levels of supply, the choice was always made with an upward bias. If two or three projections of quantities supplied seemed reasonable, the one with the highest value was adopted to protect the final solution from optimistic conclusions.

Those projections with a level of 250 thousand Tm. or below for Belgium-Luxemburg were discarded because by 1963, slaughter had reached a figure of 249. The remaining projections were those of numbers 1 and 2 and the final selection was determined by the above principle.

Only one of the projected levels for France is above the selected level of production, the high estimate of CREDOC. This appeared to be out of line with increases in previous years. In fact the 2,135 thousand Tm. adopted seemed possible only when projecting supplies on the basis of the high production years in France during the period

1950-1966, (that is 1954 and 1964). Also, the production incentives policy provided by past milk prices does not seem to be viable in view of the events described in Chapter II.

The highest level of production in Germany reached in 1962, 1,297 thousand Tm. caused the discarding of those projections for 1975 which border on the 1,300 figure. The high projection in the IFO study, 1,453, required only an increase of 11 per cent above the quantity of 1962.

The constantly increasing production in Italy reached a maximum of 638 and 625 thousand Tm. in years 1962 and 1966. The evolution of past production indicated that a linear function would fit the data and the projection to 1975 derived from it suggested the adoption of the highest estimate of FAO. This represents approximately an 11 per cent increase over 1962.

Given that the value of 343 thousand Tm. for the Netherlands was reached during 1963, the high level of 383 estimated by the study by Hathaway and Sorenson seemed reasonable. As in other cases this projection implied an increase of slightly more than 10 per cent over the highest slaughter year.

Again the projected increase for the United Kingdom over the year of maximum production was about 10 per cent, or slightly below. It should be noted, however, that no effort was made to align the percentage increases around

this figure. In fact, the implied percentages were calculated only after the values were selected. The calculation of study 12 seems to be out of bounds since several years during the period 1950-1966 reflected quantities slaughtered above 883. The quantity finally chosen was obtained using the supply function estimated in Chapter V and the price level suggested by trial runs for 1975 which used similar quantities projected.

The highest level of production of the United States was 9,345 thousand Tm. in 1966 and the projection used could appear extensive. This is not so if one analyzes the past evolution of U. S. production. Increases in production during the 17 years considered has been tremendous, almost doubling during the period.

The linear function used to project to 1975 is as follows:

$$Q_t = 4,742.79 + 249,02 t \quad ; \quad R^2 = 0.85$$

(17.14) (9.22)

Number of observations: 17

The strong trend toward increasing prices also suggested the likelihood of an important production increase by 1975.

Finally, the most likely value chosen for the quantity supplied by Australia in 1975 was very close to the "most likely" figure projected by the study of Gr  n and

others. It is centered on the low estimate provided by FAO and represents a 24 per cent increase over the maximum production figure registered on the agricultural year 1964/65. In a similar fashion to that of the United States, the increase was very large, although not as large. Although the production fluctuations have been rather great, the evolution of past production suggests the possibility of considerable increases.

Orientation prices for cattle.--Given the fundamental role that orientation prices play upon the determination of the quantities consumed and traded in the model, the need arises to estimate the most likely levels for them to 1975. The most reasonable assumption regarding the rate of growth of orientation prices for 1975 seemed to be that of adopting past rates. It was unlikely that growth rates would be higher than those between 1965 and 1969 because of the difficulties in CAP financing explained in Chapter II, and on the other hand, the conservative assumptions used in the study from the point of view of Argentine exports. Although there is a possibility for increases in prices lower than those registered by the historical record, a conservative attitude assumes a constant rate of growth.

The calculation of past increases is made in Table VI-10. The estimations were carried out on the basis of a calendar year because of the period for which projections are to be made and the calendar year nature of the data

TABLE VI-10.--Annual Percentage Increases of Orientation Prices in FEC Countries in Nominal and Real US\$ of 1965.

Calendar Year	Belgium			France			Germany			Italy			Netherlands		
	Nominal		Real	Nominal		Real	Nominal		Real	Nominal		Real	Nominal		Real
	Price	Inc.		Price	Inc.		Price	Inc.		Price	Inc.		Price	Inc.	
1965	592	592	3.88	574	574	2.26	590	590	2.71	590	590	4.07	578	578	1.90
1966	633	615	-0.33	605	5.4	587	624	5.76	606	632	7.12	614	607	5.02	589
1967	650	613	-0.33	631	4.3	595	644	3.21	608	652	3.16	615	622	2.47	587
1968	673	612	-0.17	668	5.86	607	672	4.35	611	674	3.37	613	645	3.70	586
1969	680	596	-2.62	680	1.79	596	680	1.04	596	680	1.04	596	680	5.43	596
Average % increase	3.53	0.76		4.34	0.96		3.59	0.27		0.45			4.16		1.30

SOURCE: Calculated with price data obtained from Statistical Office of the European Communities, Agrarstatistik, several issues, and with cost of living indexes and exchanged rates from International Monetary Fund, International Financial Statistics, several issues.

used to estimate the demand functions and the slaughter point projections. The nominal prices for the calendar years were obtained by weighting the number of months for each agricultural year during which a particular price level was enforced. The nominal prices were deflated by the cost of living index and the calculation of annual increases for each country of both series was performed.

The average increases in nominal prices ranged from a low of 3.53 per cent for Belgium to a high of 4.16 per cent for the Netherlands, with an overall average for all EEC countries of 3.86 per cent for the period 1965-1969. The average increment of real prices had a low of 0.27 per cent and a high of 1.3 per cent for Germany and the Netherlands, respectively. The differences in the rates of increase are due to the price alignment goals followed during the transitional period and the unequal initial price levels. The overall average increase in annual orientation prices in real terms for the Six was 0.75 per cent. It is possible to assume by rounding the above figures, that price increases for all the EEC have been 4 and 1 per cent in nominal and real terms, respectively, during the period 1965-1969 for adult cattle.

The next step was to project the orientation price level for 1975 under two alternative assumptions. The first, previously explained, is that they will continue at the same real rate experienced in the past, i.e., an annual

1 per cent. The second to be used for an alternative run¹ is that the growth rate will double that observed for 1965-1969, i.e., an annual increase of 2 per cent. Table VI-11 presents the calculations and both sets of projections.²

Variable levies.--The demand and supply conditions were such that no variable levy was necessary to reach the orientation price level of US\$ 699 per liveweight Tm. of adult cattle.

"Ad Valorem" duties.--Changes in the 1966 trial consisted of the elimination of intra EEC duties completed by July 1, 1968. The same "ad valorem" duties enforced in 1966 are expected to be used during 1975 except for the elimination mentioned.

Fixed import duties.--No change is expected for 1966.

Export taxes.--No export duties are expected to be applied during 1975. The only relatively important level used was that for Argentina during 1966, but although its level was increased a few months later on, a gradual decline

¹This data will be used in the model run where highest orientation prices for the EEC are considered.

²It should be noted that the actual price levels to be used to 1975 under both assumptions are US\$ 1,300 and 1,378 since 699 and 741 are projections of liveweight prices and need to be converted to carcass weight by multiplying by conversion coefficient 1.86.

TABLE VI-11.--Calculation of Orientation Prices for 1975 on the Basis of 1 and 2% Annual Increase.

Year	Nominal Orientation Price ^a	Conversion Coefficient ^b	Nominal O. Price Converted ^c	Cost of Living-Index 1965 = 100	Real Orientation Prices to Use	
					with 1% annual increase	with 2% annual increase
1968	672	1.06	712	110	(647)	(647)
1969	707	1.06	749	114 ^d	657	657
1970					664	670
1971					671	684
1972					678	698
1973					685	712
1974					692	726
1975					699	741

NOTES: ^afor adult cattle.^bto apply to convert orientation price of adult cattle to orientation prices of the type of animal used to estimate the demand functions.^cfor type of animal used in the SEM.^dprovisional.

has been occurring since, and it is expected to diminish altogether. The tax used in New Zealand was unimportant during 1966 and was also assumed to disappear.

Import quotas.--It was assumed that only in the U. S. will quotas continue to be imposed. There are no indications that other countries will be imposing this kind of restrictions in the near future or that those in use in the United States are going to disappear. The only change that may be expected is the relaxation in the level of the quota adopted in 1966. The quotas have been modified in accordance with the needs of higher imports, and the large increases in domestic prices that have been taking place lately in region 8 might induce further liberalities. However, a certain proportion may be continued considering increases in output as has happened in the past. The procedure adopted to project the level for 1975 followed the general lines of that adopted in 1964. Starting from a quantity of 601,156 Tm., the base year for 1966, and an expected increase in domestic output of 20 per cent to 1975, the increase in the quota should be 120,231 Tm. (20 per cent over 601,156) plus 72,139 Tm. (an adjustment of 10 per cent over the base quantity plus the 20 per cent increase above calculated), which makes a total quota in 1975 of 793,526 Tm.

The distribution of these quotas among the participating countries of the agreement was assumed to be the same,

since no changes have been registered in the past, i.e., 60, 25, 8, and 7 per cent for Australia, New Zealand, Ireland, and Mexico, respectively. This represents a quota allowed for each one in the order mentioned of 476,116, 198,382, 63,482, and 55,547 Tm.

Lack of information regarding possible changes in the direction and magnitude of variables other than those specifically discussed here led to the assumption of no change. There are no indications of possible modifications in such variables as transfer costs, marketing margins between producers and exporters, and price differences between meat qualities with respect to 1966.

Results

Table VI-12 presents the results of consumption, gross imports of 011.1, gross exports of 011.1, net imports of 011.1, net imports of other beef, total net imports, and slaughters forecasted for 1975 under "most likely conditions". It is still useful to have the results concerning prices and distribution of trade flows, but the discussion will start with a comparison of aggregate Net Imports of 011.1, Other beef, and Total Beef between 1966 and 1975. Table VI-13 shows the corresponding figures. Several important aspects can be observed from it:

- (a) the total level of Argentine exports is expected to increase by 106.6 thousand Tm. from 1966 to 1975 reaching an equivalent carcass weight in 1975 of

TABLE VI-12.--Consumption, Net Imports, and Slaughtering Projected to 1975 Under "Most Likely Conditions".
(Th. Tm. of e.c.w.t.)

Region	Consumption	Gross Imports of 011.1	Gross Exports of 011.1	Net Imports of 011.1	Net Imports of Other Beef	Total Net Imports	Slaughtering
Argentina	2,167.4	0.0	462.9	-462.9	-229.7	-692.6	2,860.0
Belgium-Lux.	273.5	0.6	4.8	- 4.2	2.7	- 1.5	275.0
France	2,050.4	42.2	116.4	- 74.2	- 10.4	- 84.6	2,135.0
Germany	1,769.6	310.8	0.0	310.8	5.8	316.6	1,453.0
Italy	1,384.3	673.3	0.0	673.3	1.0	674.3	710.0
Netherlands	298.6	34.7	124.3	- 89.6	5.2	- 84.4	383.0
U. Kingdom	1,294.2	149.2	3.0	146.2	120.0	266.2	1,028.0
U. S. A.	12,111.5	783.0	16.3	766.7	127.8	894.5	11,217.0
Australia	428.5	0.0	786.6	-786.6	- 34.9	-821.5	1,250.0
New Zealand	154.0	0.0	225.4	-225.4	- 23.6	-249.0	403.0
Ireland	57.0	0.0	277.4	-277.4	- 20.6	-298.0	355.0
Denmark	99.0	0.0	100.7	-100.7	- 10.3	-111.0	210.0
R. of L. A.	..	21.4	153.4	-132.0	- 57.0	-189.0	..
Canada	1,027.0	2.8	11.2	- 8.4	32.4	24.0	1,003.0
Rest of the World	..	364.7	100.3	264.4	91.6	356.0	..

TABLE VI-13.--Comparison of Net Imports of 011.1, of Other Beef, and of Total Beef Between 1966 and 1975.
(in thousand Tm. of equivalent carcass weight)

	Net Imports of 011.1			Net Imports of Other Beef			Net Total Imports of Beef		
	In 1966	In 1975	Change	In 1966	In 1975	Change	In 1966	In 1975	Change
Argentina	- 457	-462.9	- 5.9	- 129	-229.7	-100.7	-586.0	-692.6	-106.6
Bel.-Lux.	8	- 4.2	-12.2	2	2.7	0.7	10.0	- 1.5	-11.5
France	- 32	- 74.2	-42.2	- 7	-10.4	- 3.4	-39.0	-84.6	-45.6
Germany	132	310.8	178.8	4	5.8	1.8	136.0	316.6	180.6
Italy	298	673.3	375.3	1	1.0	0.0	299.0	674.3	375.3
Netherlands	- 25	- 89.6	-64.6	4	5.2	1.2	-21.0	-84.4	-63.4
U. Kingdom	350	146.2	-203.8	81	120.0	39.0	431.0	266.2	-164.8
U. S. A.	452	766.7	314.7	87	127.8	40.8	539.0	894.5	355.5
Australia	- 401	-786.6	-385.6	- 24	-34.9	-10.9	-425.0	-821.5	-396.5
New Zealand	-142	-225.4	- 83.4	-16	-23.6	- 7.6	-158.0	-249.0	- 91.0
Ireland	- 76	-277.4	-201.4	-14	-20.6	- 6.6	- 90.0	-298.0	-208.0
Denmark	- 90	-100.7	-10.7	- 7	-10.3	- 3.3	- 97.0	-111.0	-14.0
R. of the L. A.	-150	-132.0	18.0	- 39	-57.0	-18.0	-189.0	-189.0	0.0
Canada	- 25	- 8.4	16.6	8	32.4	24.4	-17.0	24.0	41.0
R. of the World	158	264.4	106.4	49	91.6	42.6	207.0	356.0	149.0

SOURCE: Tables VI-1 and VI-12.

692,600 Tm. The greater exports in 1975 represent a percentual increase of 16.5 over 1966, or an annual average increase of 1.36 per cent.

- (b) Argentina is forecasted to be displaced as the largest world exporter of beef by Australia which is projected to increase her exports from a total of 425,000 to 821,500 Tm. from 1966 to 1975. Australia is projected to export almost 130,000 Tm. more than Argentina during 1975.
- (c) The United States is projected to hold its position as the largest world importer, but Italy and Germany are projected to displace the United Kingdom from second position. The predicted increases are of 355,000, 375,000, and 180,000 Tm. for the United States, Italy and Germany, respectively and a decrease of 164,800 for the United Kingdom.
- (d) Substantial changes are expected to take place in other regions also. Region 15, which designates the Rest of the World, with an increase in imports of 149,000 and Ireland and New Zealand with export increases of 208,000 and 91,000 Tm., respectively are the regions which will likely register changes.

It is possible to see other minor aspects, in reference to the composition of the flows, but they deserve less attention. Since the level of beef imports other than 011.1 was determined outside the model, the level of 011.1

beef imports was automatically determined when arriving at the overall solution. Since the forecasted level of Argentina exports is, for example, 692,600 Tm. and the exports of Other beef were set at 229,700 Tm. it follows that the residual of 462,900 are exports of 011.1. In other words the higher or lower levels of total exports affect only the exports of 011.1 because the other exports were fixed at a particular level. The consequence is that Argentine exports of 011.1 increased by an insignificant figure of 5,900 out of the total increase of 106,600 Tm. Had exports of Other beef been endogenous to the model also, the distribution of the export increment might have been different. For this reason the more sensible figure to take into account is the overall increase of 106,600 Tm.

On the other hand the small increase in the Argentine exports of 011.1 is determined by the fact that Argentina is the main supplier of canned beef and other varieties of beef which have been encompassed here under the heading of Other beef to the United States and the United Kingdom. And given that the predicted increase of both these types of imports is relatively important (approximately 40,000 Tm.) in relation to the total increase predicted in Argentine exports, both tend to absorb most of Argentina's export surplus. If the Argentine surplus had been higher the additional increases would have been in exports of 011.1. The remaining change of importance that

TABLE VI-14.--Basic Run to 1975: Total Trade Flows and Regional Prices (under "Most-favored-nations" conditions). (th. Trn. in e.c.w.t. and real US\$ of 1965)

Origin	Besti- nation)	Argentina	Belgium- Lux.	France	Germany	Italy	Netherlands	United Kingdom	U. S. A.	Australia	New Zealand	Ireland	Denmark	Rest of Latin Am.	Canada	Rest of the World	Gross Exports	Regional Price
Argentina	..	..	2.7	9.4	5.8	25.8	1.1	50.6	88.2	..	..	..	..	21.4	20.0	215.0	692.6	522
Belgium-Lux.	..	..	..	0.1	..	..	4.8	..	..	..	..	..	..	..	..	..	4.9	1,320
France	..	..	..	..	..	150.5	1.1	..	..	..	..	..	..	..	..	11.8	126.8	1,293
Germany	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,343
Italy	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,331
Netherlands	..	..	..	2.3	121.9	..	..	..	..	..	..	..	..	..	..	..	124.3	1,304
U. Kingdom	..	..	..	2.5	..	..	0.5	..	..	..	..	..	..	..	..	..	3.0	1,114
U. S. A.	..	..	..	0.2	..	..	3.1	..	..	..	..	..	..	..	..	..	16.3	1,193
Australia	..	..	0.6	2.2	26.4	212.0	..	17.7	181.4	..	..	..	..	..	13.0	2.9	821.5	763
New Zealand	..	..	..	0.7	..	..	..	23.6	193.7	..	..	..	..	..	..	31.0	249.0	685
Ireland	..	..	..	4.2	121.5	..	..	169.9	..	..	..	..	..	..	..	..	298.0	804
Denmark	..	..	..	6.5	15.2	..	4.0	7.4	..	..	..	..	..	..	..	58.0	111.0	862
W. of U. A.	..	..	..	3.3	..	5.4	..	..	134.0	..	..	..	..	..	..	61.0	210.4	528
Canada	..	..	..	..	..	..	..	..	13.4	..	..	..	..	..	..	..	13.4	1,051
Rest of the World	..	..	..	10.8	5.7	41.4	..	..	..	..	..	..	..	..	..	..	100.4	1,361
Gross Imports	..	..	3.3	42.2	316.6	674.3	34.1	269.2	910.8	..	..	..	..	21.4	37.4	456.4	..	..
Net Imports	..	..	-1.5	-84.6	316.6	674.3	-84.4	266.2	894.5	-821.5	-249.0	-298.0	-111.0	189.0	24.0	356.0	2,771.5	..

affected the level of Other beef exports was the increase forecasted for Canada, also coming from Argentina.

Because the other exporters are not important traders of products other than those falling within the category 011.1, by far the largest increases were included in it. Therefore, there is a strong positive correlation between the change of total beef exports and that of 011.1 beef exports. The same thing takes place on the importing side: a strong positive correlation between total imports and 011.1 imports. The only two cases in which this is not as important are for the United Kingdom and the United States which, as already noted, are projected to have increments of approximately 40,000 Tm. of other beef. It is remarkable that for the former the reduction of 011.1 imports is greater than the overall imports reduction, but this is due to the independent projection of the increase in Other beef imports.

Table VI-14 contains the distribution of trade flows within the various regions and the regional prices. It will be surprising to observe, that the projected distribution is highly different from the one registered during 1966 or any other past year. The outstanding changes are the tremendous increase predicted for Italy, with almost 260,000 coming from Argentina, and the considerable decrease for the United Kingdom, Argentina's traditionally main market, with a level somewhat above 50,000 Tm. Increases are registered

for exports to the U. S., Canada, and the Rest of the World, while an important decrease is forecasted for Germany.

Table 15 shows the changes of destination which the model forecasts for 1975 with respect to actual 1966 quantities. The most radical changes in terms of market shares are those corresponding for Italy which increased it from 12.46 to 37.47 per cent, the United Kingdom from 29.25 to 7.31 per cent, and West Germany from 7.71 to 0.84 per cent.

TABLE 15.--Changes in the Destination of Argentine Exports Between 1966 and Basic Run Results to 1975.
(th. Tm. of e.c.w.t. and percentages)

Region of Destination	1966	% of the Total	Basic Run 1975	% of the Total
Belg.-Lux.	12,271	2.18	2,725	0.39
France	8,908	1.59	9,375	1.36
Germany	43,307	7.71	5,844	0.84
Italy	69,982	12.46	259,518	37.47
Netherlands	18,210	3.24	19,892	2.88
U. Kingdom	164,366	29.25	50,618	7.31
U. S. A.	59,713	10.63	88,160	12.73
Rest of L. A.	21,400	3.80	21,400	3.09
Canada	0,0	0,0	20,000	2.89
Rest of World	163,695	29.14	215,000	31.04
Total	561,852	100	692,594	100

SOURCES: Table VI-1, estimates of Other beef exports, and Table VI-14.

It can be seen from Table VI-14 that a tendency exists towards a concentration of exports in a few main flows: Argentina shipping to Italy, France to Italy, Netherlands to Germany, Australia to Italy and the United States, New Zealand to the United States, Ireland to Germany and the United Kingdom, and Rest of L. America to the

United States and Rest of the World. This is probably one of the most important deficiencies of the model: its tendency to oversimplify despite the considerable capacity it has for utilizing variables important in the real world and that no other model can handle. An unescapable conclusion is that reality is much more complex than the mathematical models that can be used to represent it. The prospect exists, nonetheless, for incorporating new formulations which will allow the researcher to get closer to the real world.

If the overall EEC market is considered, the level of Argentine exports is predicted to increase from 152,678 during 1966 to 297,354 Tm., an increase of 94.76 per cent. And if the United Kingdom is added, the change is from 317,044 to 347,972 Tm., a positive change of 11 per cent. The EEC represented an overall share of 27.17 and 42.93 per cent of the total beef exports in 1966 and predicted for 1975 respectively. The addition of the United Kingdom changes the percentage of the total Argentine outlets from 56.5 during 1966 to 50.2 to projected 1975. This way of portraying the future EEC market on one hand and the Six plus the United Kingdom on the other hand is much more reasonable than considering the predicted distribution on a one-by-one basis because of the possibility of committing mistakes due to the inadequacy of the model to reflect the trade flows. This is increased because of a higher degree

of confidence in the aggregate rather than in individual projections.

Viewing the projected quantities for 1975 in this way, some reflections can be made for the whole EEC. In the first place the Six are expected to increase the total level of their net imports from 385,000 to 820,343 and those coming from Argentina from 152,678 to 297,354 Tm. circumstance which indicates a change in the share of EEC net imports coming from Argentina from 39.7 per cent to 36.3 per cent. The pressure of demand upon domestic supply, (which leads to increased imports) also has the effect of substantially raising the price level and eliminating the variable levies. In fact, the considerable increases of market prices projected for the EEC countries are the most important elements which make them better markets for other exporters. They produce, as a consequence, a trade diversion from the United Kingdom towards the EEC. This in turn leads to an increase in the United Kingdom domestic prices which inversely affects the level of consumption and motivates a considerable decrease in the level of imports.

It is finally of interest to analyze the price projections for 1975 and compare them with the actual values of 1966. Table VI-16 presents both:

TABLE VI-16.--Basic Run Projections of Regional Prices to 1975 and Its Comparison with Respect to Those of 1966.

Region	Actual 1966 Prices	Predicted 1975 Prices	Percentage Inc. of Prices
(real US\$ of 1965 per Tm. of e.c.w.t.)			
1	370	522	41
2	1,177	1,320	12
3	1,040	1,293	24
4	1,258	1,342	7
5	1,284	1,331	11
6	1,145	1,304	14
7	867	1,114	28
8	879	1,193	38
9	553	763	38
10	470	685	46

SOURCES: Tables VI-1 and VI-14.

Estimated Impact of Model Run with
Argentine Supply of 2,903,000 Tm.

Data Used

The data was the same as that for the Basic Run for 1975, except for the level of Argentine supply which was increased by 43,000 (1.5 per cent over the quantity used for the basic run).

Given that under the previous formulation the level of market prices for the EEC countries were above the orientation prices, judged as likely for that year, and that no variable levies were needed to support such a price, it was interesting to note the limiting quantity of Argentine slaughters for 1975 consistent with the remaining data under the assumptions of "most likely conditions". The question was to see if Argentine production could push

further than the 2,860,000 Tm. judged as likely for 1975, without EEC imposition of variable levies.

Results

The model suggests that it is possible for Argentina to increase production by the mentioned quantity without market prices falling below the orientation prices. Expanding production beyond this level would imply that EEC countries would require the application of variable levies. It is evident that, in fact, already at this increased level of 43,000 Tm. the market price of France is US\$ 17 below the orientation price level (see Table 6 of the Appendix to this chapter).

The results obtained in this run do not significantly differ from those of the Basic Run except for the increase in Argentine exports. The increase of 43,000 Tm. in Argentine slaughters would result in an additional 34,742 Tm., 80 per cent of the total.

It is possible to obtain a coefficient which resembles the elasticity of world demand for Argentine exports with the data obtained in the previous and present runs. Given the percentage increase of exports of 5.02 $(34,742 \times 100 / 692,574)$ in response to the percentage decrease of prices of 0.76 $(4 \times 100 / 522)$ the "elasticity of the world demand for Argentine exports of beef" is equal to 6.60 within the range where the changes occurred. This information is of limited validity, however, not only

because of perfectly inelastic supply functions for all regions and of the demand functions for regions 10 to 15, but because the variable levies of the EEC were not enforced within this range. Despite these limitations, on the other hand, it is surprising to find such a high elasticity for an agricultural product.

Because of the higher reliability placed on overall figures, as already explained, comments here will refer to aggregate changes, rather than to the composition of them. The net total increase of the EEC is 455.3 with Italy and Germany as the importers and the remaining members the exporters. The change from 385,000 in 1966 to 840,300 Tm. in 1975 implies more than duplicating the initial level. Adding the United Kingdom, the increase is from 816,000 to 1,118,400 Tm., a net positive change of 302,400 Tm.

The same warnings made for the Basic Run, with respect to the composition of exports and the distribution of trade flows hold for this run but some additional comments can be made regarding the market share changes expected to take place for Argentina between 1966 and 1975. The data are presented in Table VI-18.

It is also possible to evaluate the changes from 1966 to 1975 in the importance of the EEC market, on one hand, and the EEC together with the United Kingdom, on the other. Table VI-19 provides the basic data for such an evaluation.

TABLE VI-17.--Comparison of Net Total Imports of Beef in 1966 and Model Run with Argentine Supply of 2,903,000 Tm. in 1975.
(in thousand Tm. of equivalent carcass weight)

Region	Net Total Imports of Beef		
	In 1966	In 1975	Change
Argentina	- 586	- 727.3	- 141.3
Belgium-Lux.	10	- 0.5	- 10.5
France	- 39	- 79.4	- 40.4
Germany	136	323.3	187.3
Italy	299	678.6	379.6
Netherlands	- 21	- 81.7	- 60.7
E.E.C.	385	840.3	455.3
U. Kingdom	431	278.1	- 152.9
E.E.C. + U.K.	816	1,118.4	302.4
U. S. A.	539	894.5	355.5
Australia	- 425	- 818.6	- 393.6
New Zealand	- 158	- 249.0	- 91.0
Ireland	- 90	- 298.0	- 208.0
Denmark	- 97	- 111.0	- 14.0
R. of L. A.	- 189	- 189.0	0.0
Canada	- 17	24.0	41.0
Rest of the World	207	356.0	149.0

SOURCES: Tables VI-1 and 6 of the Appendix to this chapter.

TABLE VI-18.--Changes of Market Shares of Argentine Exports to the EEC and United Kingdom from 1966 to 1975 with Argentine Supply of 2,903,000 Tm.

Importing Region	1966		1975	
	Total Imports	Imports From Argentina	Argentine Market Share	Total Imports
	(Thousand Tm.)	(Thousand Tm.)	(%)	(Thousand Tm.)
2-6	385	152.7	39.7	840.3
7	431	164.4	38.1	278.1
2-7	816	317.1	38.9	1,118.4
				(%)
				39.5
				18.2
				34.2

SOURCES: Tables VI-1 and VI-17.

TABLE VI-19.--Changes in the Percentage That the EEC, and the EEC and the U. K. Represent Out of the Total Beef Exports of Argentina from 1966 to 1975 with Argentine Supply of 2,903,000 Tm.

During 1966		(Th. Tm. of e.c.w.t. and percentages)		During 1975	
Total Argentine Exports	Exports to EEC	Exports to EEC and UK	Total Argentine Exports	Exports to EEC	Exports to EEC and UK
586.0	152.7	317.1	727.3	332.1	382.7
100%	26.1%	54.1%	100%	45.7%	52.5%

SOURCE: Table VI-15.

Estimated Impact of Model Run with
Argentine Supply of 3,000,000 Tm.

Data Used

The previous run considered an increase of 43,000 Tm. of the Argentine supply over the point estimate used in the Basic Run. It indicated the possibility of increasing Argentine exports by 34.7 thousand Tm., (when production rises by 43,000 Tm.) without market prices in the EEC falling below orientation prices. The purpose of this run is to observe a higher level of slaughters in Argentina, determine the possible increase of Argentine exports under more optimistic conditions and to observe whether the decline provoked in world prices, and particularly EEC prices, is a violent one or not.

Results

Table VI-20 shows the results with approximate exports for Argentina at 808,000 Tm. It can also be observed that market prices would drop below orientation prices, mainly in France and the Netherlands. The differences between orientation and market prices would be important enough to apply variable levies throughout the Six, tending to reduce imports to lower levels than those reflected here.

The comparison in Table VI-21 reveals that exports to the EEC and the United Kingdom would increase by 115.6 thousand Tm. if Argentine slaughter were increased by

TABLE VI-20.--Model Run with Argentine Supply of 3,000,000.^a (th. Tm. in a.c.w.t. and real (\$ of 1945))

Origin	Desti- nation)	Argentina	Belgium- Lux.	France	Germany	Italy	Netherlands	United Kingdom	U. S. A.	Australia New Zealand	Ireland	Denmark	Rest of Latin Am.	Canada	Rest of the World	Gross Exports	Regional Price
Argentina	..	..	2.7	9.4	5.8	375.1	19.9	50.6	88.2	..	..	..	21.4	20.0	215.0	808.1	508
Belgium-Lux.	..	..	..	0.1	..	..	4.8	..	..	..	..	..	..	..	..	4.9	1,287
France	..	..	..	..	93.1	..	4.6	..	..	..	..	..	..	..	11.8	109.5	1,260
Germany	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,310
Italy	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,298
Netherlands	..	..	..	2.3	112.9	..	..	..	..	..	..	..	..	..	..	115.3	1,271
U. Kingdom	..	..	..	2.5	..	..	0.5	..	..	..	..	..	..	..	..	3.0	1,087
U. S. A.	..	..	..	0.2	..	..	0.1	..	..	..	..	..	..	13.0	2.9	16.3	1,193
Australia	..	..	4.1	2.2	4.1	221.2	..	17.7	481.4	..	..	..	..	4.4	76.6	811.9	741
New Zealand	..	..	..	0.7	..	..	..	23.6	193.7	..	..	..	..	..	31.0	249.0	685
Ireland	..	..	..	4.2	81.9	..	2.4	239.5	..	..	..	..	..	..	..	298.0	782
Denmark	..	..	..	6.5	35.2	..	4.0	7.4	..	..	..	..	..	..	..	111.0	839
Rest of L. A.	..	..	..	3.3	..	8.4	3.7	..	134.0	..	..	..	..	..	61.0	210.4	514
Canada	..	..	..	..	..	..	..	..	13.4	..	..	..	..	..	..	13.4	1,051
Rest of the World	..	..	..	10.8	5.7	83.8	..	..	..	..	..	..	..	..	..	100.4	1,328
Gross Imports	..	..	6.9	42.2	338.8	688.6	39.9	104.8	910.8	..	..	..	21.4	37.4	456.4	2,851.1	..
Net Imports	..	..	2.0	-67.3	338.8	688.6	-75.4	105.8	896.5	-811.9	-249.0	-111.0	-189.0	24.0	356.0	..	..

^aThe remaining assumptions are identical to those of the Basic Run.

TABLE VI-21.--Comparison of Argentine Exports to the Six, the United Kingdom, and the Six Plus the United Kingdom, and Total Exports Assuming Argentine Supplies of 2,860,000 and 3,000,000 Th.

Argentine Exports	(Th. Tm. in e.c.w.t.)		
	With Argentine Supply of		
	2,860	3,000	Change
EEC	297.3	412.9	115.6
United Kingdom	50.6	50.6	0.0
EEC + U. K.	347.9	463.5	115.6
Total	692.6	808.1	115.6

SOURCES: Tables VI-14 and VI-20.

143,000 Tm. The decline of Argentine prices as a consequence of the increased slaughters, with respect to the Basic Run (See Tables VI-14 and VI-20), is not important: only US\$ 14. And Argentine prices under the present assumptions are much higher than those of 1966: US\$ 370 (See Tables VI-1 and VI-20).

Trade diversion from the EEC towards the United Kingdom could take place in response to the application of variable levies as will be seen.

Estimated Impact of Model Run with Higher
Orientation Prices for the EEC

Data Used

Modifications in the data, with respect to the basic run, refer to the level of orientation prices. The rate of increase in orientation prices assumed for this run doubles that of the basic run. The calculation was shown in Table VI-11.

Since the study is using point estimates for slaughters to 1975, the assumption of higher orientation prices requires some corrections. Table VI-22 shows them.

Results

Table VI-23 shows very important changes with respect to actual 1966 results and the basic run. Argentina's exports suffer a considerable decline as a consequence of the application of higher orientation prices and the need to use variable levies in the EEC to raise domestic price levels.¹ The exports that reached the level of 692,574 Tm. in the basic run drop here to 506,293 Tm., a level below that of the base year: 586,000 Tm.

Because of the distortion produced in the matrix flow, probably due to the high prices in Italy and to the fact that the route to Italy is the cheapest one, the fall of Argentine exports above mentioned is registered in the quantity exported to Italy.

It is more illustrative to comment on the overall changes in the imports of each member of the EEC and of the

¹It will be noticed that the price solutions are not uniform throughout the Community. This is an impossible achievement with the handled model, (at least without distorting the results with the use of some gimmick); but on the other hand, it reflects tolerable differences that respect the approximate ranking of production costs within the EEC. It may also reflect the approximate ordering of prices within them and given the relatively small differences the domestic agencies might tend not to intervene.

TABLE VI-22.--Projections of Quantities Supplied to 1975 Assuming an Annual Increase of 2 Per Cent of the Orientation Prices of the Community Instead of 1 Per Cent.^a

Region	Quantity Supplied with 1% Increase	Price Elasticity Assumed ^b	Increase in Quant. Supplied	Quantity Supplied with 2% Increase
	(Th. Tm. of e.c.w.t.)		(Thousand Tm. of e.c.w.t.)	
2	275,000	1.7	22,375	297,375
3	2,135,000	0.6	64,050	2,199,050
4	1,453,000	1.7	123,505	1,576,505
5	710,000	1.0	35,500	745,500
6	383,000	1.7	32,555	415,555

^aThe increase of an annual additional of 1 per cent with respect to column (2) is calculated from 1970 to 1975. The total increase would be equal to 6 per cent (1% x 6) but since the price of 1975 is not expected to affect much the level of supplies of the same year the effect of only five years was assumed. The total price increase is then 5 per cent over that assumed for the Basic Run from 1969 to 1975.

^bThe choice of price elasticities was a hard one because of the conflicting evidence that exists. The selection was mainly based on the trials explained when dealing with the estimation of supply functions in Chapter V. The degree of reliability of the estimations was not found acceptable but the use of the coefficients here obtained seemed better than no corrections.

TABLE VI-23.--Comparison of Net Total Imports of Beef of 1966 and Basic Run, with Those of Model Run with Annual Increases of 2 Per Cent for EEC Orientation Prices.

(Th. Tm. in e.c.w.t.)			
Region	In 1966	Net Total Imports of Beef	
		Basic Run	2% Increase of Orientation
1	- 586	- 692.6	- 506.3
2	10	- 1.5	- 27.0
3	- 39	- 84.6	- 184.9
4	136	316.6	160.3
5	299	674.3	609.0
6	- 21	- 84.4	- 162.8
2-6	385	820.4	394.6
7	431	266.2	440.8
2-7	816	1.086.6	835.4
8	539	894.5	894.5
9	- 425	- 821.5	- 756.6

SOURCES: Table VI-1, VI-14, and 7 of the Appendix to this Chapter.

total EEC as well as the changes which supposedly could take place in the United Kingdom rather than discuss the distribution of trade flows. The preceding table portrays the important changes with respect to 1966 and the basic run.

The negative influence upon Argentina is exaggerated here because of the assumption of a completely inelastic supply of exports in New Zealand, Ireland, Denmark, and the Rest of Latin America, which, in the face of unfavorable circumstances, are supposed in the model to continue with the same level of exports. Otherwise that part of the effect would be felt by them and the reduction in the exports of Argentina would not be so large. The negative

consequences for Argentina are also stressed because Australia has the United States as its primary, a country outlet not affected by the application of higher variable levies as in the Six.

The incentive that higher orientation prices provide for domestic production in the EEC, combined with the consumption disincentive brings down the overall level of imports of the Community to approximately that of 1966. It is possible to observe, nonetheless, that although the overall quantum of imports is the same, the importance of France and the Netherlands as net exporters and of Italy and Germany as net importers grows, and Belgium changes its status from net importer to exporter. As seen in the last column of Table VI-23 the reduction in the level of imports with respect to the basic run is greater for Germany than for Italy due to the higher increment of quantity supplied assumed for Germany.

It is interesting to notice that the imposition of variable levies in the Community motivates a trade diversion of exports towards the United Kingdom which reaches, as a result, a quantity of imports commensurable to that of 1966. The possibility of trade diversion that the higher EEC prices offered to the exporters in the basic run and the model run with Argentine supply of 2,903,000 Tm., producing a considerable decline of United Kingdom imports with respect to 1966, inverted now with the application of the "prelevements" under higher EEC orientation prices.

The conclusion of this run is that an increment of an annual 2 per cent in orientation prices for adult cattle in real terms to 1975 would frustrate the possibilities of higher exports for Argentina that the EEC otherwise might offer as a consequence of considerably higher income levels. It could be said, leaving aside the negative effect exaggerated by the distortion of the completely inelastic supply of exports recently mentioned, that the orientation price level of US\$ 741 per liveweight Tm. (in real 1965 dollars) would bring Argentina back to the export levels of 1966.

Estimated Impact of Model Run with No
EEC "Ad Valorem" Duties for Argentina

Data Used

The changes made here consist in the elimination of the 20 per cent "duties" that the EEC countries impose upon Argentine imports. This assumption was made for speculative purposes to find out whether the magnitude of the change might be important or not. The feasibility of the Community accepting such unilateral reductions is very small, but it was "a priori" assumed that a general elimination would be even less likely.

Results

The results indirectly provide a partial verification of the hypothesis that a significant decline of EEC prices would take place with the elimination of all "ad

valorem" duties no matter the origin of imports. The assertion is made in view of the results obtained from the assumption of eliminating them only for Argentina. Even with this unique change, the level of market prices fell below the common target price of US\$ 1,300. They were 1,276, 1,249, 1,299, 1,287 and 1,260 for regions Belgium-Luxembourg, France, Germany and the Netherlands.

The comparison of the results obtained with those of the basic run clearly point to the substantial increase of 153.1 thousand Tm. (845.7 - 692.6) that could take place in Argentine exports under the change. The most important factor would be the increase in the EEC imports, but due to the Community's lower prices, exporters other than Argentina would send an increased volume to the United Kingdom (See Tables VI-14, VI-24, and 8 of the Appendix to this chapter). Finally, the third factor working in favor of Argentina would be a lower quantity exported by Australia to the EEC due to the preferential treatment granted to Argentina. Argentina's increase would be even greater than the one postulated by this model under an alternative assumption of an elasticity greater than zero of the supply of exports of regions 10 to 13 for the same reason as for the Australian decline. In other words, the additional increases from Argentina would tend to be matched by comparable reduction in imports from other regions.

TABLE VI-24.--Comparison of Net Total Imports of the Basic Run with Those Verified Under the Assumption of No "Ad Valorem" EEC Duties for Argentina.

(in thousand Tm. of equivalent carcass weight)		
Net Total Imports of Beef		
Region	With Basic Run for 1975	With No "Ad Valorem" Duties for Argentina in EEC
1	- 692.6	- 845.7
2	- 1.5	3.2
3	- 84.6	- 61.6
4	316.6	346.1
5	674.3	693.2
6	- 84.4	- 77.4
2-6	820.4	903.5
7	266.2	323.5
2-7	1,086.6	1,227.0
8	894.5	894.5
9	- 821.5	- 808.8

SOURCES: Tables VI-14 and 8 of the Appendix to this chapter.

In summary, Argentina would be able to substantially increase her exports to the Community if a unilateral elimination of the "ad valorem" duties in her favor were adopted. This would be at the expense of other suppliers, since market prices have to be close to orientation prices according to the CAP, and this discrimination would be hardly acceptable to EEC officials. There have been instances in which a preferential treatment has been granted to a supplier, namely Denmark, and a trade agreement with Yugoslavia which presently is being negotiated¹ would offer

¹Not to mention the preferences granted to African countries because of specific cultural, political and economic relations with them.

special arrangements. Despite these, such an agreement would put the EEC on the spot for practicing discrimination in its trade relations.

Estimated Impact of Model Run with the U. K.
"Ad Valorem" Duty Reduced to 5 Per Cent

Data Used

The modifications refer to the reduction of the "ad valorem" duty applied by the United Kingdom upon imports from regions Argentina and the Rest of Latin America. The duty, which was 20 per cent in the Basic Run, was reduced to 5 per cent for this run.

The reason for this change was the possibility of a favorable outcome from the negotiations Argentina is holding with the United Kingdom to mitigate the ban on imports enforced by the U. K. during the first quarter of 1968. It was argued at that time that the foot and mouth disease which affected the importing country originated in Argentina although the evidence inadequately supported this claim. The negotiations deal with the possibility of opening imports for certain types of beef generally applied to beef classified under the 011.1 SITC (revised) group.

Results

The results indicate that Argentine exports to the United Kingdom would tend to increase by approximately 38,500 Tm. but that most of it would be at the expense of

exports to the Common Market.¹ The level of EEC imports from Argentina would tend to decline from 297,354 to 263,539 Tm.

Argentina's exports would increase by only approximately 5,000 Tm. in response to the reduction of the duty according to the comparison prepared in Table VI-25. It can also be seen that the total increase in the importing markets represented by the addition of regions 2 to 7 amounts to only 6,500 Tm. supplied by Argentina and Australia.

The reader should be reminded that the information in the basic run for the United Kingdom did not assume the continuation of the ban on imports from Argentina and Rest of Latin America. Consequently, the increase of Argentine exports to the U. K. of about 38,500 Tm. would be due exclusively to the reduction of the "ad valorem" duty and not from a joint elimination of the ban and a lower import duty.

Estimated Impact of Model Run with a
25 Per Cent Argentine Export Tax

Data Used

The unique alteration made in this run is the application of an "ad valorem" export tax in Argentina.

¹The discussion on the distribution of exports should be remembered here. The exports to the U. K. would increase in this run to 89,076 Tm. in comparison with the 50,618 Tm. of the Basic Run, but more importance should be given to the overall results.

TABLE VI-25.--Comparison of Net Total Imports of Basic Run with Those Verified Under the Assumption of a Reduction of the "Ad Valorem" Import Duty of the U. K. to 5 Per Cent.

(Th. Tm. in e.c.w.t.)		
Net Total Imports of Beef		
Region	With Basic Run for 1975	With Reduced "Ad Valorem" Duty of U. K. to 5 Per Cent
1	- 692.6	- 697.2
2	- 1.5	- 1.9
3	- 84.6	- 87.5
4	316.6	320.4
5	674.3	671.9
6	- 84.4	- 82.8
2-6	820.4	820.1
7	266.2	273.0
2-7	1,086.6	1,093.1
8	894.5	894.5
9	- 821.5	- 823.3

SOURCES: Tables VI-14 and 9 of the Appendix to this chapter.

Since the Argentine government levied such a heavy tax during some months of 1967 and, although reduced, some taxes are still in use, it is important to learn what effects such a tax may have on exports.

It is a clear case of goals in opposition. While Argentine officials tried to avoid the possibility of income transfers which could occur as a result of the devaluation accomplished in 1967, they were discouraging exports by means of the tax. Export taxes are still being enforced today, although mainly for revenue purposes. Despite the strong efforts being made to achieve higher exports to the EEC and the usual complaints concerning the application of

"prelevements", the Argentine government has persisted. The purpose of this run is the evaluation of the effects it might have upon the exports to the Community, and of the overall exports.

Results

The application of the levy reduced Argentina's equilibrium price from US\$ 522 to 462, and produced a decline in total exports of 113,355 Tm. The decrease from 692.6 registered in the Basic Run, to 579.2 obtained in this one, is reflected mainly in the exports to the Six due to the remaining assumptions. As one might expect the vacuum left by Argentina produces a lower level of imports in net importer regions 2 to 8, and an increase of exports in Australia, Argentina's most important competitor.

Special care should be taken in evaluating the results of this run due to the assumptions of perfectly inelastic supplies for the 15 regions. Export supplies in Argentina become more inelastic and the effect is stronger than if a supply with an elasticity higher than zero had been used. This is because of the greater adjustment in quantities in response to price increases along the "demand for imports" function of the Argentine customers. The possibility of increasing the exports in regions 10 to 13 (because of the point estimates used for both consumption and slaughters) and in Australia (which can only increase exports at the expense of domestic consumption) in response

TABLE VI-26.--Comparison of Net Total Imports of Basic Run with Those Verified Under the Assumption of an Export Tax Applied in Argentina of 25 Per Cent.

(Th. Tm. of e.c.w.t.)		
Region	With Basic Run for 1975	With 25 Per Cent Argentine Export Tax
1	- 692.6	- 579.2
2	- 1.5	- 2.1
3	- 84.6	- 105.8
4	316.6	301.1
5	674.3	656.9
6	- 84.4	- 90.7
2-6	820.4	759.4
7	266.2	238.6
2-7	1,086.6	998.0
8	894.5	881.4
9	- 821.5	- 833.2

SOURCES: Tables VI-14 and 10 of the Appendix to this chapter

to higher prices in the importing regions also affects the outcome in the same way. But the opposite occurs in the foreign importing markets since the demand for imports becomes more inelastic when assuming a perfectly inelastic domestic supply. However, the evidence that the Argentine supply is highly inelastic implies that the assumption is not far removed from reality.

Summarizing, the overall impact of an export tax seems to be sizable. Some qualifications of the results are needed because of the restrictive assumptions used in the model, but evidence of a low supply elasticity for Argentina suggests that there is a strong negative effect

in response to the application of an export tax. An additional run might show supply elasticities greater than zero to evaluate the sensitivity of the solution to these factors.

Estimated Impact of Model Run with the
U. K., Ireland, and Denmark Also in
EEC and High Rates of CNP Growth
of Regions 2 - 7

Data Used

Several changes were made to the data assumed for the basic run as follows: GNP growth rates, orientation prices, point estimates of supply, and import restrictions. Comments will be made about each.

GNP projections.--The observation of GNP growth rates of the Six before and after the formation of the Community¹ suggests that the rates of growth in regions 2 to 7 might also be favorably affected by the effects of an enlarged EEC. The main effects would be consequences of greater competition and of the possibilities of taking advantage of economies of scale.

Two alternatives were considered in that context:

(a) that the rates of growth of GNP would be those presented below the column entitled "Favorable Conditions" of Table VI-4; (b) that the effects upon rates of growth of

¹See the discussion about GNP projections made for the basic run.

regions 2-7 would be favorable but not as strong as those assumed in (a). The selection for this second alternative arbitrarily fell upon rates of growth halfway between those assumed for the basic run and those of alternative (a). The assumption name in (a) is to be used for this run while that of (b) will be adopted in the next run.

Orientation prices for cattle.--It was assumed that if the United Kingdom would become a member of the EEC, her traditionally low protective policy would be reflected in Community decisions in increases of orientation prices that would favor the lower alternative chosen for the basic run rather than that adopted in the model run with higher EEC orientation prices. For this reason the orientation price of US\$ 699 per liveweight Tm. of adult cattle (US\$ 1,300 in terms of the model) adopted to 1975 for the Six was extended (for this run) to the United Kingdom, Ireland, and Denmark.

Projections of slaughterings for the United Kingdom.--The change of production conditions that producers would expect to occur by the entrance of the United Kingdom into the EEC gives rise to the need for modifying the level of slaughters within the United Kingdom. Instead of developing specific projections for this trial, data were derived from the study of Colin Clark¹ which analyzed, as a policy

¹Clark, op. cit.

alternative, the incorporation of the country to the Common Market.

Clark states that the assumption of the United Kingdom entrance into the EEC tends to change significantly the pattern of production, consumption and trade with overall import requirements to 1975 projected to be further reduced from levels projected under the continuation of present policies. Beef is included among the products that are projected to show a decrease in imports.

The named study attributes the decline of imports from a projected level of 463 thousand Tm., with present policies continued, to 356 thousand Tm. under the assumption of entrance into the EEC. This despite the projected reduction of quantity supplied to 1975 from 1,009,000 to 982,000 Tm. According to this research the factor promoting the decline of the United Kingdom slaughters is the diversion of resources from beef and milk to grain production as a consequence of higher price increases in the latter group than in the former as the country adjusts relative prices to become a member of the Community.

The point projection adopted for slaughters of the United Kingdom is that used in the study of Colin Clark, 982,000 Tm.

Projections of supply, demand, and exports of Ireland and Denmark.--The alignment of prices at both the consumption and production levels in Ireland and Denmark as a

consequence of their entrance into the Community would bring about changes in the quantities supplied, demanded, and exported. Table VI-27 shows estimates for them.

Starting from point estimates of supply, demand, and exports outside the EEC, calculations of the corresponding quantity changes were made with the use of estimated price increases and price elasticities. The expected quantity changes were then added to the initial projections. Because of the close economic connections between Ireland and the United Kingdom and particularly by the Anglo-Irish Free Trade Agreement, price levels in both countries are very much alike. The structure of production and beef consumption between both does not differ much either, and therefore, the same price increases and elasticities were assumed for Ireland as for the United Kingdom.

Variable levies and "Ad Valorem" duties.--The "ad valorem" duties used between the present EEC members and the candidates of the enlarged Community for the basic run were eliminated for this run. The common "ad Valorem" duty imposed by the Six to imports from nonmember countries was extended to the three newcomers as well as the application of variable levies if the need arose.

Results

Table 11 of the Appendix to this chapter, which shows the results of this run allows for the elaboration of

TABLE VI-27.--Point Estimates of Supply, Demand, and Exports of Ireland
and Denmark Under Assumption of Entrance Into EEC.

Region	Point Esti- mates of:	Projections Outside EEC	Price Incr.	Price Elast.	Quantity Change	Project Within EEC
		Tm.	%	%	Tm.	Tm.
11	Supply	355,000	16.3	0.75	43,398	398,398
11	Demand	57,000	26.0	0.33	- 4,902	52,098
11	Exports	298,000			48,300	346,300
12	Supply	210,000	50.0	0.50	52,500	262,500
12	Demand	99,000	50.0	0.30	-14,850	84,150
12	Exports	111,000			67,350	178,350

Table VI-28 that compares them with those obtained for the basic run. Argentina's exports increase by over 60 thousand tons.

Australia, Ireland and Denmark also benefit from the increase in imports that takes place in the Common Market as a consequence of the entrance of the United Kingdom, Ireland and Denmark. The tremendous increase in the Common Market more than offsets the decrease in the United Kingdom. The former change owes its origin to the outward shift of the demand function produced in turn by the increase in income. The latter in turn is due to the orientation price extended from the Six to the United Kingdom. The higher domestic price discourages consumption and imports decline by 149.2 thousand Tm. The overall level of imports in the Six plus the United Kingdom shows, nevertheless, a very substantial increase of 285.6 thousand Tm.

An upward bias of these results will be assumed by anyone who remembers the use of a completely inelastic supply function for the Six. The higher the elasticity (in the actual world) the higher will be the bias. On the other hand, a downward bias should be recognized for Argentina, Australia, New Zealand and Rest of Latin America, which are not exporters but where the model allowed no adjustment of their supplies in response to higher prices for their foreign outlets.

TABLE VI-28.--Comparison of Net Total Imports of Basic Run with Those Obtained with the U. K., Ireland, and Denmark Also in EEC.

(Th. Tm. in e.c.w.t.)			
Region	With Basic Run for 1975	With U. K., Ireland and Denmark in the EEC and High Rates of Growth of Regions 2 - 7	Change of Imports
1	- 692.6	- 755.2	- 62.6
2	- 1.5	12.8	14.3
3	- 84.6	103.9	188.5
4	316.6	400.0	83.4
5	674.3	807.9	133.6
6	- 84.4	- 69.4	15.0
2-6	820.4	1,255.2	434.8
7	266.2	117.0	-149.2
2-7	1,086.6	1,372.2	285.6
8	894.5	808.8	- 85.7
9	- 821.5	- 843.3	- 21.8

SOURCES: Tables VI-14 and 11 of the Appendix to this chapter.

Estimated Impact of Model Run with the U. K.,
Ireland and Denmark, Also in EEC and Low
Rates of Growth of Regions 2-6

Data Used

All the information used was identical to that of the previous trial except for the gross national product projections included in regions 2 to 6. The alternative (b) explained in the previous run when dealing with GNP Projections was chosen for this run. GNP rates of growth achieved by the regions above mentioned might not be as high as those experimented by the initial members of the Community. It might be possible that most of the positive

impacts to be derived from integration have already been obtained by joining the economies of the three largest members of the present Community: France, Germany, and Italy. These arguments do not imply that these lower rates of growth are more likely to occur than the ones selected for the previous run, but do point out the possibility of their taking place and their possible effects.

The GNP growth rates were assumed to increase by 0.80, 1.05, 0.65, 0.95 and 0.75 in Belgium-Luxemburg, France, Germany, Italy and Netherlands, respectively.

Results

Table 12 of the Appendix to this chapter condenses the results that are partially shown in Table VI-29 to provide a comparison with the figures of the Basic Run.

Table VI-29 shows that, although a substantial increase of 278.7 thousand Tm. takes place in the EEC imports, the benefit for Argentina is slim. There are three reasons for such a circumstance. The first is that a considerable decline of imports occurs in the United Kingdom when higher market prices are enforced in response to her entrance into the EEC. The second is that most of the benefit is collected by Ireland and Denmark where an adjustment was used to recognize higher domestic prices. The estimated higher slaughters and lower consumption leading to sizable increases in exports were forced into the solution. Finally, the third factor is determined by the perfectly inelastic

TABLE VI-29.--Comparison of Net Total Imports of Basic Run with Those Obtained Assuming the Enlargements of the EEC and Low Rates of GNP Growth of Regions 2-6.

(Th. Tm. in e.c.w.t.)			
Region	With Basic Run to 1975	With U. K., Ireland and Denmark in the EEC	Change of Imports
1	- 692.6	- 702.9	- 10.3
2	- 1.5	8.3	9.8
3	- 84.6	25.8	110.4
4	316.6	380.7	64.1
5	674.3	752.1	77.8
6	- 84.4	- 67.8	16.6
2-6	820.4	1,099.1	278.7
7	266.2	117.0	-149.2
2-7	1,086.6	1,216.1	129.5
8	894.5	894.5	0.0
9	- 821.5	- 825.1	3.6

SOURCES: Tables VI-14 and 12 of the Appendix to this chapter.

supply function assumed for Argentina that allows only for reductions in domestic consumption to satisfy the possibility of improved foreign outlets.

The contrast between the last columns of Tables VI-28 and VI-29 is caused by the difference of the GNP growth rates. In spite of the substantial differences between both regarding the increased imports in regions 2 to 6, the conclusions for both trials is that the income effect is much stronger than the price effect. Obviously the importance of the effects depends upon the magnitudes of the assumed changes of domestic prices and GNP growth rates.

It might be interesting to find out the rates of growth that would allow the income effect to match the effect of higher domestic prices within the United Kingdom, in other words the growth rate that would allow for no changes in the level of imports to regions 2-6 from Argentina. It seems from the results obtained in the previous and present run that a slightly lower GNP growth than those adopted for the latter would provide the referred balance. An average annual increase of the GNP growth rates of 0.75 in regions 2-6 would probably produce no changes in the level of Argentine exports to an enlarged EEC.

Estimated Impact of Model Run with Unfavorable
GNP Growth Rates for the EEC

Data Used

The modifications here concern the rate of growth of the gross national product for the members of the Common Market. A lower rate of growth is assumed now for regions 2-6 to evaluate the differences that might emerge in the allocation of production, consumption, trade and prices of the EEC and Argentina.

The method used for calculating the GNP levels to 1975, as well as the rates implied and the actual values were discussed when analyzing the GNP projections (under the heading of Data Used) for the Basic Run to 1975.

Results

The lower income level tended to depress the market prices in the Six which were kept close to the orientation price level through the application of variable levies. They discouraged imports which resulted in lower prices in the exporting regions. The Argentine price declined from US\$ 522 registered in the Basic Run to 479 and reductions also occurred in Australia, which saw greater difficulties in her export outlets, and in the United Kingdom due to the diversion of beef to the UK occasioned by the higher barriers to entry into the Community.

The net negative impact upon Argentine exports was of 81,997 Tm. produced by a decline from 692,574 Tm. in the Basic Run to the 610,577 of this trial. The comparison between them shows a total decline of EEC imports of 228.9 thousand Tm. while those of the United Kingdom increased from 266.2 to 384.5 thousand Tm. Due to the offset produced by the United Kingdom, the net decline of the importing regions 2 to 7 amounts to 110,600 Tm.

Argentina's exports under the unfavorable rates assumed for 1975 are only slightly higher than those of 1966, the former being 610.6 while the latter was 586.0 thousand Tm., a net increase of 24,600 Tm.

The negative effects of lower GNP growth rates in the Community would be very strong regarding her demand for imports. Argentina would be affected unfavorably, being

TABLE VI-30.--Comparison of Net Total Imports of Basic Run with those Verified Under the Assumption of Unfavorable GNP Growth Rates for the EEC Countries.

(in th. Tm. of e.c.w.)		
Region	With Basic Run for 1975	With Lower GNP Growth Rates in the EEC
1	- 692.6	- 610.6
2	- 1.5	- 15.5
3	- 84.6	- 137.3
4	316.6	211.4
5	674.3	615.9
6	- 84.4	- 83.0
2-6	820.4	591.5
7	266.2	384.5
2-7	1,086.6	976.0
8	894.5	894.5
9	- 821.5	- 792.9

SOURCES: Tables VI-14 and 13 of the Appendix to this chapter.

able to increase her total exports only 24,600 Tm. in nine years. The possibilities of diverting exports to the United Kingdom, where additional quantities could be absorbed when the EEC market becomes less favorable, does not represent a feasible solution since Ireland is located nearby and the U. K. needs other markets when being pushed out by EEC restrictions.

Estimated Impact of Model Run with Favorable GNP Growth Rates for the EEC

Data Used

The third alternative regarding rates of growth of gross national product is used here. The basic run and the

previous run respectively assumed "most likely" and "unfavorable" rates while this run will consider "favorable" ones. The procedures and actual values used for regions 2 to 6 were presented at the beginning of the discussion dealing with the basic run.

Results

A pronounced increase in Argentine exports of 87,805 Tm., with respect to the basic run is projected to take place under the assumed higher rates of growth for the Six. The forecasted change goes from 692.6 under basic run conditions to 780.4 thousand Tm. under the named circumstances.

Table VI-31 reflects considerable increases in EEC imports influenced mainly by France's change from net exporter to net importer and by increasing Italian imports. The decline of the United Kingdom as an importer, due to better prospects the EEC could offer to exporters, tends to offset to some extent the rise in the Common Market, but the balance between them results in a net increment of 374,000 Tm. The prices, as might be expected, tend to skyrocket in response to the strong stimulus provided by the shift of the demand function. In Argentina they climb from US\$ 522 to 569 and are above 1,400 in the EEC members, with the exception of the Netherlands (1,392).

The results should be qualified for the same reasons as those explained for other trials. On one hand, the inelastic supply functions of the net importers do not allow

TABLE VI-31.--Comparison of Net Total Imports of Basic Run with Those Verified Under the Assumptions of Unfavorable and Favorable GNP Growth Rates of the EEC Countries.

(in th. Tm. of e.c.w.)			
Region	With Basic Run for 1975	With Lower GNP Growth Rates of the EEC	With Higher GNP Growth Rates of the EEC
1	- 692.6	- 610.6	- 780.4
2	- 1.5	- 15.5	9.6
3	- 84.6	- 137.3	88.0
4	316.6	211.4	379.6
5	674.3	615.9	794.8
6	- 84.4	- 83.0	- 77.6
2-6	820.4	591.5	1,194.4
7	266.2	384.5	159.0
2-7	1,086.6	976.0	1,353.4
8	894.5	894.5	746.0
9	- 821.5	- 792.9	- 852.1

SOURCES: Tables VI-14, 13 and 14 of the Appendix to this chapter.

for a positive domestic reaction in quantities supplied to higher prices tending to make the level of additional imports required lower than forecasted. On the other hand, the inelasticity of supply also assumed for the exporters does not allow them to react in a similar fashion in response to higher prices, although the possibility of the low elasticity of the Argentine supply function should not be forgotten.

The results are strongly influenced by the increases predicted for France and Italy, as previously mentioned. In comparing the differences in the rates of growth assumed for the basic run and this trial it is evident that the greatest

jump lies precisely in these two regions. It might be argued that the rates adopted for the basic run were too low or that the ones assumed for this run were too high. A reevaluation suggests that the former hypothesis might be correct in light of past rates and of the rate recently experienced by France (in view of the events during May and June, 1968). Despite these highly unfavorable events France grew at a rate slightly lower than 4%. A similar conclusion might be reached for Italy which even in a year of relative recession, such as 1968, grew at about 5%.

An interesting comparison of the effect of alternative rates of growth is provided in Table VI-31. The difference in Argentine exports between the third and fourth column is 169.8 thousand Tm., substantial quantity. It should be noted that the upward biases of the income effect are added in this calculation because of the overestimation of dropping imports and rising exports in response to lower and higher GNP growth rates respectively. The importance of the gap between the results of the trials nevertheless leads to deposit some confidence in the substantial effects in response to changes in the assumed GNP growth rates.

Estimated Impact of Model Run with High
Orientation Prices and Favorable GNP
Growth Rates in the EEC

Data Used

This trial combines the data of the run which assumed higher orientation prices than those used in the

Basic Run, with that of the previous run, which assumed higher GNP growth rates in the Six. The purpose of this run is to provide an indication of the possible combined effects of high orientation prices with favorable growth rates of GNP, the former bringing about declining imports and the latter tending to increase them.

Results

The outcome of the combination of the opposite effects above named is a net increase in Argentine exports. The positive (from Argentina's point of view) influence of income is stronger than that of higher orientation prices. The change from the results obtained in the Basic Run is a net increment of 48.3 thousand Tm. calculated by subtracting the figure of 692.6 of the second column from the 740.9 thousand Tm. of the last column. (See figures in Table VI-32).

The same table presents an increment of total imports of the Community equal to 164,300 Tm. (984.7 minus 820.4 thousand Tm.) and a net increase, after taking into account the opposite change for the United Kingdom, of 115,300 Tm. (1,201.9 minus 1,086.6 thousand Tm.) for the aggregate of regions 2 to 7. The decrease in the level of United Kingdom imports as well as that for the United States is motivated by the better market the EEC offers to exporters.

It is important to notice that the qualifications made in previous runs regarding the assumption of perfectly inelastic supply schedules do not apply here for the most

TABLE VI-32.--Comparison of Net Total Imports of Runs Reflecting Basic Conditions, High Orientation Prices, High GNP Growth Rates and Those Verified Under the Combined Effects of Both High Orientation Prices and GNP Rates of Growth of the EEC.

Region	With Basic Run for 1975	With High Orient. Prices	With High GNP Growth Rates of the EEC	With High Prices And GNP Growth Rates in the EEC
1	- 692.6	- 506.3	- 780.4	- 740.9
2	- 1.5	- 27.0	9.6	- 3.8
3	- 84.6	- 184.9	88.0	49.4
4	316.6	160.3	379.6	288.8
5	674.3	609.0	794.8	779.8
6	- 84.4	- 162.8	- 77.6	- 129.5
2-6	820.4	394.6	1,194.4	984.7
7	266.2	440.8	159.0	217.2
2-7	1,086.6	835.4	1,353.4	1,201.9
8	894.5	894.5	746.0	844.4
9	- 821.5	- 756.6	- 852.1	- 838.3

SOURCES: Tables VI-14, and 7, 14 and 15 of the Appendix to this chapter.

important regions in question (2-6). An allowance was made for increases in quantities supplied that might take place in response to higher prices producers would receive when higher orientation prices are enforced.

It would appear from the direct comparison of Argentine exports reflected in columns two and three, and in columns two and four, that the price effect upon discouraging beef exports is stronger ($186,300 = 692,600 \text{ minus } 506,300 \text{ Tm.}$) than the income effect ($87,800 = 780,400 - 692,600$) upon encouraging them. However, the net effect ($48,300 \text{ Tm.}$) leads one to the opposite conclusion. It is also interesting to note that the direction of the net effect was the same between the formation of the Community and 1967, the importance of the rising GNP and population levels was greater than that of the high degree of protectionism.

APPENDIX OF CHAPTER VI

TABLE 1.--Estimation of Total Net Imports for 1966, According to Spatial Equilibrium Model.

Region	Net Imports of 011.1	Net Imports of Other Beef	Net Total Imports
Argentina	- 458,623	- 129,000	- 587,623
Belgium-Lux.	- 4,589	2,000	- 2,589
France	- 14,787	- 7,000	- 21,787
Germany	140,138	4,000	144,138
Italy	273,944	1	273,945
Netherlands	- 7,032	4,000	- 3,032
U. Kingdom	403,169	81,000	484,169
U. S. A.	375,791	87,000	462,691
Australia	- 383,011	- 24,000	- 407,011
New Zealand	- 142,000	- 16,000	- 158,000
Ireland	- 76,000	- 14,000	- 90,000
Denmark	- 90,000	- 7,000	- 97,000
R. of L. A.	- 150,000	- 39,000	- 189,000
Canada	- 25,000	9,000	- 16,000
Rest of the World	158,000	50,000	208,000

TABLE 2.--GNP Projections Under Unfavorable Conditions. (millions of real US\$ of 1965)

Regions	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
Argentina	14,300	14,903	15,532	16,187	16,870	17,582	18,324	19,097	19,903	20,735
Belg.-Lux.	17,575	18,020	18,476	18,943	19,442	19,914	20,418	20,935	21,464	22,004
France	98,155	101,414	104,781	108,781	111,854	115,567	119,404	123,368	127,464	131,724
Germany	118,057	122,159	126,405	130,797	135,342	140,045	145,331	150,381	155,607	160,557
Italy	59,848	62,284	64,819	67,457	70,202	73,060	76,033	79,128	82,341	85,702
Netherlands	20,185	20,962	21,769	22,607	23,478	24,382	25,320	26,295	27,307	28,360
U. K.	130,997	135,556	140,273	145,154	150,205	155,432	160,842	166,439	172,231	178,156
U. S. A.	725,825	751,084	777,221	804,269	832,257	861,220	891,190	922,204	954,296	987,122
Australia ^a	24,381	25,407	26,477	27,592	28,754	29,964	31,225	32,540	33,910	35,352

^aThe initial and final periods are 1966/67 and 1975/76 respectively.

TABLE 3.--GNP Projections Under "Most Likely Conditions". (millions of real US\$ of 1965)

Regions	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
Argentina	14,300	14,903	15,532	16,187	16,870	17,582	18,324	19,097	19,903	20,735
Belg.-Lux.	17,660	18,275	18,910	19,569	20,250	20,954	21,683	22,438	23,219	24,018
France	99,935	103,413	107,011	110,735	114,589	118,577	122,703	126,973	131,392	135,912
Germany	119,994	125,058	130,335	135,835	141,568	147,542	153,768	160,257	167,020	173,991
Italy	60,981	63,554	66,236	69,031	71,944	74,980	78,144	81,442	84,879	88,422
Netherlands	19,815	20,651	21,522	22,430	23,376	24,362	25,390	26,461	27,578	28,732
U. K.	130,997	135,556	140,273	145,154	150,205	155,432	160,842	166,439	172,231	178,156
U. S. A.	725,825	751,084	777,221	804,269	832,257	861,220	891,190	922,204	954,296	987,122
Australia ^a	24,381	25,407	26,477	27,592	28,754	29,964	31,225	32,540	33,910	35,352

^aThe initial and final periods are 1966/67 and 1975/76 respectively.

TABLE 4.--GNP Projections Under Favorable Conditions. (millions of real US\$ of 1965)

Regions	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975
Argentina	14,300	14,903	15,532	16,187	16,870	17,582	18,324	19,097	19,903	20,735
Belg.-Lux.	17,660	18,643	19,625	20,608	21,590	22,572	23,555	24,537	25,520	26,502
France	99,935	106,009	112,083	118,157	124,232	130,306	136,380	142,454	148,528	154,602
Germany	119,994	127,548	135,102	142,656	150,210	157,764	165,318	172,872	180,426	187,980
Italy	60,981	65,184	69,387	73,590	77,793	81,996	86,199	90,402	94,605	98,808
Netherlands	19,815	21,108	22,401	23,694	24,987	26,280	27,573	28,866	30,159	31,452
U. K.	130,997	135,556	140,273	145,154	150,205	155,432	160,842	166,439	172,231	178,156
U. K. ^a	130,997	136,984	143,244	149,790	156,635	163,793	171,279	179,106	187,292	195,841
U. S. A.	725,825	751,084	777,221	804,269	832,257	861,220	891,190	922,204	954,296	987,122
Australia ^b	24,381	25,407	26,477	27,592	28,754	29,964	31,225	32,540	33,910	35,352

^aThis alternative was used for RN9 and RN10.^bThe initial and final periods are 1966/67 and 1975/76 respectively.

TABLE 5.--Producer Price Projections to 1975. (real US\$ of 1965 per liveweight Tm.)

Years	Regions and Products				
	Argentina		France		Australia
	Pork		Pork	Poultry ^a	Sheep ^a
1966	272		588	1,431	500
1967	275		598	1,420	500
1968	278		608	1,410	500
1969	280		618	1,401	500
1970	283		628	1,392	500
1971	285		638	1,383	500
1972	288		647	1,374	500
1973	290		657	1,367	500
1974	293		667	1,360	500
1975	295		677	1,352	500

^aAt the wholesale level.

TABLE 6.--Model Run with Argentine Supply of 2,903,000.^a (th. Tm. in e.c.w.t. and real US\$ of 1965)

Origin	Desti- nation)	Argentina	Belgium- Lux.	France	Germany	Italy	Netherlands	United Kingdom	U. S. A.	Australia	New Zealand	Ireland	Denmark	Rest of Latin Am.	Canada	Rest of the World	Gross Exports	Regional Price
Argentina		..	2.7	9.4	5.8	294.3	19.9	50.6	88.2	..	..	..	..	21.4	20.0	215.0	727.3	518
Belgium-Lux.		..	..	0.1	..	..	4.8	..	..	..	..	..	..	..	..	..	4.9	1,310
France		..	..	..	47.7	57.6	4.6	..	..	..	..	..	..	..	..	11.8	121.6	1,283
Germany		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,333
Italy		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,321
Netherlands		..	..	2.3	119.2	..	..	..	..	..	..	..	..	..	..	..	121.6	1,294
U. Kingdom		..	..	2.5	..	..	0.5	..	..	..	..	..	..	..	..	..	3.0	1,106
U. S. A.		..	..	0.2	..	..	0.1	..	..	..	..	..	..	..	13.0	2.9	16.3	1,193
Australia		..	1.7	2.2	..	234.5	..	17.1	481.4	..	..	..	..	..	4.4	76.6	818.6	757
New Zealand		..	..	0.7	..	..	..	23.6	193.7	..	..	..	..	..	..	31.0	249.0	685
Ireland		..	..	4.2	109.6	..	2.3	181.8	..	..	..	..	..	..	..	..	298.0	798
Denmark		..	..	6.5	35.2	..	4.0	7.4	..	..	..	..	..	..	..	..	111.0	855
R. of L. A.		..	..	3.3	..	8.4	3.7	..	134.0	..	..	..	..	..	..	61.0	210.4	524
Canada		..	..	..	..	..	..	..	13.4	..	..	..	..	..	..	..	13.4	1,051
Rest of the World		..	..	10.8	5.7	83.8	..	..	..	..	..	..	..	..	..	..	100.4	1,351
Gross Imports		..	4.4	42.2	323.3	678.6	39.9	281.1	910.8	..	..	..	..	21.4	37.4	456.4	..	..
Net Imports		-727.3	-0.5	-79.4	323.3	678.6	-81.7	278.1	894.5	-818.6	-249.0	-298.0	-111.0	-189.0	24.0	356.0	..	..

^aThe basic run assumed an Argentine supply of 2,860,000 Tm. The remaining assumptions are identical to those of the basic run.

TABLE 7.--Model Run Increased by an Annual 2 Per Cent with Respect to 1969 Orientation Prices for the EEC.

Origin	Desti- nation)	Argentina	Belgium- Lux.	France	Germany	Italy	Netherlands	United Kingdom	U. S. A.	Australia	New Zealand	Ireland	Denmark	Rest of Latin Am.	Canada	Rest of the World	Gross Exports	Regional Price
Argentina	..	..	2.7	9.4	5.8	73.3	17.4	50.6	48.2	..	..	..	..	21.4	20.0	215.0	506.3	423
Belgium-Lux.	..	..	..	0.1	24.9	..	4.3	..	..	..	..	..	..	..	..	..	29.8	1,349
France	..	..	..	..	..	210.7	4.6	..	..	..	..	..	..	..	..	11.8	227.1	1,361
Germany	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,391
Italy	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,399
Netherlands	..	..	..	2.3	123.9	76.5	..	..	..	..	..	..	..	..	..	..	202.6	1,352
U. Kingdom	..	..	..	2.5	..	..	9.5	..	..	..	..	..	..	..	..	..	3.0	995
U. S. A.	..	..	..	0.2	..	..	0.1	..	..	..	..	..	..	..	..	..	13.0	1,193
Australia	..	..	..	2.2	..	156.3	..	35.5	481.4	..	..	..	..	..	4.4	76.6	756.6	612
New Zealand	..	..	..	0.7	..	..	..	23.6	193.7	..	..	..	..	..	..	..	249.0	685
Ireland	..	..	..	4.2	..	..	2.4	291.4	..	..	..	..	..	..	..	..	298.0	787
Denmark	..	..	..	6.5	..	..	4.0	42.6	..	..	..	..	..	..	..	58.0	111.0	719
Rest of L. A.	..	..	..	3.3	..	8.4	3.7	..	134.0	..	..	..	..	..	..	61.0	210.4	630
Canada	..	..	..	..	..	..	..	..	13.4	..	..	..	..	..	..	..	13.4	1,091
Rest of the World	..	..	..	10.8	5.7	83.8	..	..	..	..	..	..	..	..	..	..	100.4	1,156
Gross Imports	..	..	2.7	42.2	160.3	609.0	39.9	443.7	910.8	..	..	..	..	21.4	37.4	456.4	2,723.0	..
Net Imports	..	-506.3	-27.0	-184.9	160.3	609.0	-162.8	440.8	894.5	-756.6	-249.0	-298.0	-111.0	-189.0	24.0	356.0	..	..

*The basic run assumed an Argentine supply of 2,860,000 Tm. The remaining assumptions are identical to those of the basic run.

TABLE 8.--Model Run with No ESC "Ad Valorem" Duties for Argentina.^a (th. Tm. in c.c.v.t. and real (\$\$ of 1965))

Origin	Desti- nation)	Argentina	Belgium	France	Germany	Italy	Netherlands	Kingdom	U. S. A.	Australia	New Zealand	Ireland	Denmark	Rest of Latin Am.	Canada	Rest of the World	Gross Exports	Regional Price
Argentina	..	2.7	9.4	5.8	412.9	19.7	53.6	88.2	..	..	..	..	..	21.4	20.0	215.0	845.7	603
Belgium-Lux.	..	..	0.1	..	..	..	4.3	..	..	..	..	..	..	..	..	..	4.9	1,276
France	..	..	..	87.4	..	4.6	..	..	..	..	..	..	..	..	..	11.8	103.8	1,249
Germany	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,299
Italy	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,287
Netherlands	..	..	2.3	110.0	..	..	..	..	..	..	..	..	..	..	..	..	112.3	1,260
U. Kingdom	..	..	2.5	..	..	0.5	..	..	..	..	..	..	..	..	..	..	3.0	1,078
U. S. A.	..	..	0.2	..	..	0.1	..	..	..	..	..	..	..	..	13.0	2.9	16.3	1,193
Australia	..	..	5.3	2.2	32.9	188.1	..	17.7	481.4	..	..	..	..	..	4.4	76.6	808.8	734
New Zealand	..	..	..	0.7	..	..	..	21.6	191.7	..	..	..	..	..	..	..	249.0	685
Ireland	..	..	..	4.2	69.0	..	2.4	222.4	..	..	..	..	..	..	..	..	298.0	775
Denmark	..	..	..	6.5	35.2	..	4.0	7.4	..	..	..	..	..	..	..	58.0	111.0	831
R. of L. A.	..	..	..	3.3	..	8.4	1.7	..	134.0	..	..	..	..	..	..	61.0	210.4	509
Canada	..	..	..	..	..	..	..	..	13.4	..	..	..	..	..	..	..	13.4	1,051
Rest of the World	..	..	10.8	5.7	83.8	..	..	..	..	..	..	..	..	..	..	..	100.4	1,317
Gross Imports	..	..	8.0	42.2	346.1	693.2	34.9	326.5	910.8	..	..	..	..	21.4	37.4	456.4	2,876.9	..
Net Imports	..	..	3.2	-61.6	346.1	693.2	-77.4	323.5	894.5	-808.8	-249.0	-298.0	-111.0	-189.0	24.0	356.0	..	..

^aThe basic run assumed a 20 per cent duty upon imports from Argentina. The remaining assumptions are identical to those of the basic run.

TABLE 9.--Model Run with the U. K. "Ad Valorem" Duty Reduced to 5 Per Cent.^a (th. Tls. in ex. cl. t. and reit. \$SS of 1965.

Origin	Desti- nation)	Argentina	Belgium- Lux.	France	Germany	Italy	Netherlands	U. Kingdom	U. S. A.	Australia	New Zealand	Ireland	Denmark	Rest of Latin Am.	Canada	Rest of the World	Gross Exports	Regional Price
Argentina		..	2.7	9.4	5.8	225.7	19.9	94.2	89.2	..	..	..	..	21.4	20.0	215.0	697.2	525
Belgium-Lux.		..	..	0.1	..	..	4.8	..	..	..	..	..	..	..	..	..	4.9	1,325
France		..	..	..	..	113.4	4.6	..	..	..	..	..	..	..	..	11.8	129.7	1,298
Germany		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,337
Italy		..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,336
Netherlands		..	..	2.3	120.4	..	..	..	..	..	..	..	..	..	..	..	122.7	1,298
U. Kingdom		..	..	2.5	..	..	0.5	..	..	..	..	..	..	..	..	..	3.0	1,110
U. S. A.		..	..	0.2	..	..	0.1	..	..	..	..	..	..	..	13.0	2.9	16.3	1,193
Australia		..	0.2	2.2	..	240.6	..	17.7	481.4	..	..	..	..	..	4.4	76.6	823.3	767
New Zealand		..	..	0.7	..	..	..	21.6	193.7	..	..	..	..	..	..	31.0	249.0	685
Ireland		..	..	4.2	98.2	..	2.4	134.2	..	..	..	..	..	..	..	55.0	298.0	801
Denmark		..	..	6.5	90.3	..	4.0	..	..	..	..	..	..	..	..	3.0	111.0	858
R. of the L. A.		..	..	3.3	..	8.4	3.7	..	134.0	..	..	..	..	..	..	61.0	210.4	531
Canada		..	..	..	..	..	..	..	13.4	..	..	..	..	..	..	..	13.4	1,051
Rest of the World		..	..	10.8	5.7	83.8	..	..	..	..	..	..	..	..	..	11	100.4	1,356
Gross Imports		..	3.0	42.2	320.4	671.9	39.9	276.0	910.8	..	..	..	..	21.4	37.4	456.4	..	..
Net Imports		-697.2	-1.9	087.5	320.4	671.9	-82.8	273.0	894.5	-823.3	-249.0	-298.0	-111.0	-189.0	24.0	356.0	..	..

^aThe U. K. duty assumed in the basic run was 20 per cent. The remaining assumptions are identical to those of the basic run.

TABLE 10.--Model Run with a 25 Per Cent Argentine Export Tax.^a (th. Tm. in e.c.m.t. and real US\$ of 1965)

Origin	Desti- nation)	Argentina	Belgium- Lux.	France	Germany	Italy	Netherlands	United Kingdom	U. S. A.	Australia	New Zealand	Ireland	Denmark	Rest of Latin Am.	Canada	Rest of the World	Gross Exports	Regional Price
Argentina	..	..	2.7	9.4	5.8	146.2	19.9	50.6	88.2	..	..	..	..	21.4	20.0	215.0	579.2	462
Belgium-Lux.	..	..	..	0.1	..	..	4.9	..	..	..	..	..	..	..	..	..	4.9	1,325
France	..	..	..	..	..	131.6	4.6	..	..	..	..	..	..	..	..	11.8	148.0	1,332
Germany	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,365
Italy	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,370
Netherlands	..	..	..	2.3	128.2	..	..	..	..	..	..	..	..	..	..	..	130.5	1,326
U. Kingdom	..	..	..	2.5	..	..	0.5	..	..	..	..	..	..	..	..	..	..	1,133
U. S. A.	..	..	..	0.2	..	..	0.1	..	..	..	..	..	..	..	13.0	2.9	16.3	1,198
Australia	..	..	..	2.2	..	250.7	..	17.7	481.4	..	..	..	..	..	4.4	76.6	833.2	791
New Zealand	..	..	..	0.7	..	13.1	..	23.6	180.6	..	..	..	..	..	..	31.0	249.0	699
Ireland	..	..	..	4.2	71.1	23.0	2.4	142.3	..	..	..	..	..	..	..	55.0	298.0	820
Denmark	..	..	..	6.5	90.3	..	4.0	7.4	..	..	..	..	..	..	..	3.0	111.0	878
R. of L. A.	..	..	..	3.3	..	8.4	3.7	..	134.0	..	..	..	..	..	..	61.0	210.4	566
Canada	..	..	..	..	..	..	..	..	13.4	..	..	..	..	..	..	..	13.4	1,056
Rest of the World	..	..	..	10.8	5.7	83.8	..	..	..	..	..	..	..	..	..	..	100.4	1,385
Gross Imports	..	..	2.7	42.2	301.1	656.9	39.9	241.6	897.6	..	..	..	..	21.4	37.4	456.4	..	..
Net Imports	..	..	-2.1	-105.8	301.1	656.9	-90.7	238.6	881.4	-833.2	-249.0	-298.0	-111.0	189.0	24.0	356.0	..	..

^aThe basic run assumed no export taxes in Argentina. The remaining assumptions are identical to that of the basic run.

TABLE 11.--Model Run with the U. K., Ireland, and Denmark also in EEC and with high prices of the Group of Regions 2-7.^a (In Tm. in e.c.w.t. and real US\$ of 1965)

Origin	Destination	Belgium-Lux.	France	Germany	Italy	Netherlands	United Kingdom	U. S. A.	Australia	New Zealand	Ireland	Denmark	Rest of Latin Am.	Canada	Rest of the World	Gross Exports	Regional Price
Argentina	..	2.7	9.4	5.8	322.2	19.9	50.6	38.2	..	..	..	..	21.4	20.0	215.0	755.2	555
Belgium-Lux.	..	..	9.1	..	..	4.4	..	..	..	..	..	..	..	..	..	4.9	1,394
France	..	..	..	..	..	4.6	..	..	..	..	..	..	..	..	11.8	16.4	1,395
Germany	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,401
Italy	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,405
Netherlands	..	..	2.3	106.2	..	..	..	..	..	..	..	..	..	..	..	109.2	1,362
U. Kingdom	..	..	2.5	..	..	..	..	..	..	..	..	..	..	..	..	3.0	1,307
U. S. A.	..	..	9.2	..	..	0.1	..	..	..	..	..	..	..	13.0	4.9	16.3	1,227
Australia	..	14.9	80.3	..	167.8	..	17.7	481.4	..	..	..	..	..	4.4	76.6	843.3	814
New Zealand	..	..	0.7	..	93.7	..	21.7	104.9	..	..	..	..	..	..	31.0	249.0	709
Ireland	..	..	4.2	121.9	140.0	2.4	29.7	..	..	..	..	..	..	..	55.0	346.3	1,026
Denmark	..	..	6.5	157.6	..	4.0	7.4	..	..	..	..	..	..	..	3.0	178.4	1,095
R. of the L. A.	..	..	3.3	..	8.4	7.7	..	114.0	..	..	..	..	..	..	61.0	210.4	562
Canada	..	..	..	..	..	..	..	13.4	..	..	..	..	..	..	..	13.4	1,085
Rest of the World	..	..	10.9	5.7	83.8	..	..	..	..	..	..	..	..	..	..	100.4	1,696
Gross Imports	..	17.7	120.3	400.0	807.9	31.9	130.0	825.1	..	..	..	..	21.4	37.4	456.4	2,846.1	..
Net Imports	-755.2	12.8	103.9	400.0	807.9	-69.4	117.0	808.8	-843.3	-249.0	-346.3	-178.4	-189.0	24.0	356.0	..	..

^aThe basic run assumed an EEC composed by Belgium, France, Germany, Italy and the Netherlands. Some changes were performed upon the basic projection of the Six and the United Kingdom: the orientation prices for cattle for the members; the projection of slaughterings of the U. K.; and the projection of supply, demand, and exports of Ireland and Denmark. The basic run assumed a 10% tariff on imports from the U. K. and 12% on imports from Ireland and Denmark. The remaining assumptions are identical to those of the basic run.

TABLE 12.--Model Run with the U. K., Ireland, and Denmark also in EEC, and with low GNP rates of Growth of Regions 2-6, (th. Tm. in e.c.w.t. and real US\$ of 1965)

Origin	Desti- nation)	Argentina	Belgium- Lux.	France	Germany	Italy	Netherlands	United Kingdom	U. S. A.	Australia	New Zealand	Ireland	Denmark	Rest of Latin Am.	Canada	Rest of the World	Gross Profits	Regional Price
Argentina	..	2.7	..	9.4	5.8	270.0	19.9	50.6	88.2	..	..	..	..	21.4	20.0	215.0	702.9	526
Belgium-Lux.	..	..	..	0.1	..	..	4.8	..	..	..	..	..	..	..	..	..	4.9	1,332
France	..	..	..	..	..	..	4.6	..	..	..	..	..	..	..	..	11.8	16.4	1,313
Germany	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,339
Italy	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,343
Netherlands	..	..	..	2.3	105.3	..	..	..	..	..	..	..	..	..	..	..	107.7	1,300
U. Kingdom	..	..	..	2.5	..	..	0.5	..	..	..	..	..	..	..	..	..	3.0	1,307
U. S. A.	..	..	..	0.2	..	..	0.1	..	..	..	..	..	..	..	13.0	2.9	16.3	1,193
Australia	..	10.5	..	2.2	..	232.2	..	17.7	481.4	..	..	..	..	..	4.4	76.6	825.1	772
New Zealand	..	..	..	0.7	..	..	..	23.6	193.7	..	..	..	..	..	..	31.0	209.6	685
Ireland	..	..	..	4.2	106.2	157.8	2.4	20.7	..	..	..	..	..	..	..	55.0	346.3	975
Denmark	..	..	..	6.5	157.6	..	4.0	7.4	..	..	..	..	..	..	..	3.0	178.4	1,083
Rest of the L. A.	..	..	..	3.3	..	8.4	3.7	..	134.0	..	..	..	..	..	..	61.0	210.4	594
Canada	..	..	..	..	..	..	..	..	13.4	..	..	..	..	..	..	..	13.4	1,091
Rest of the World	..	..	..	10.8	5.7	83.8	..	..	..	..	..	..	..	..	..	..	100.4	1,030
Gross Imports	..	13.2	42.2	380.7	752.1	39.9	120.0	910.8	..	..	..	..	..	21.4	37.4	456.4	2,774.1	..
Net Imports	702.9	8.3	25.8	380.7	752.1	-67.8	117.0	894.5	-825.1	-249.0	-346.3	-178.4	-109.0	24.0	356.8	..	..	..

*Sum as note of Table 11 of this Appendix.

TABLE 11.--Model Run with Unfavorable GNP Growth Rates for the FRC.^a (th. Tn. in e.c.w.t. and real US\$ of 1965)

Origin	Desti- nation)	Argentina	Belgium- Lux.	France	Germany	Italy	Netherlands	United Kingdom	U. S. A.	Australia	New Zealand	Ireland	Denmark	Rest of Latin Am.	Canada	Rest of the World	Gross Exports	Regional Price
Argentina	..	..	2.7	9.4	5.8	177.6	14.1	50.6	86.2	..	..	..	..	21.4	20.0	215.0	610.6	479
Belgium-Lux.	..	..	..	0.1	13.4	..	4.4	..	..	..	..	..	..	..	..	..	10.2	1,261
France	..	..	..	..	..	163.2	4.6	..	..	..	..	..	..	..	..	11.8	179.5	1,209
Germany	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,323
Italy	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,327
Netherlands	..	..	..	2.3	120.5	..	..	..	..	..	..	..	..	..	..	..	122.8	1,204
U. Kingdom	..	..	..	2.5	..	..	0.5	..	..	..	..	..	..	..	..	..	3.0	1,033
U. S. A.	..	..	..	0.2	..	..	0.1	..	..	..	..	..	..	..	13.0	2.9	16.3	1,193
Australia	..	..	..	2.2	27.5	183.0	..	17.7	491.4	..	..	..	..	..	4.4	76.6	792.9	697
New Zealand	..	..	..	0.7	..	..	..	23.6	193.7	..	..	..	..	..	..	31.0	209.0	695
Ireland	..	..	..	4.2	3.3	..	2.4	288.1	..	..	..	..	..	..	..	..	298.0	730
Denmark	..	..	..	6.5	35.2	..	4.0	7.4	..	..	..	..	..	..	..	58.0	111.0	793
R. of L. A.	..	..	..	3.3	..	8.4	3.7	..	134.0	..	..	..	..	..	..	61.0	210.4	485
Canada	..	..	..	..	..	..	..	..	13.4	..	..	..	..	..	..	..	13.4	1,051
Rest of the World	..	..	..	10.8	5.7	83.8	..	..	..	..	..	..	..	..	..	..	100.4	1,261
Gross Imports	..	..	2.7	42.2	211.4	615.9	39.9	387.4	910.8	..	..	..	..	21.4	37.4	456.4	..	..
Net Imports	..	..	-15.5	-137.3	211.4	615.9	-81.0	384.5	894.5	-792.9	-249.0	-298.0	-111.0	-189.0	24.0	356.0	..	..

^aThe basic run assumed higher GNP rates of growth for EEC countries. The remaining assumptions are identical to those of the basic run.

TABLE 14.--Model Run with Favorable GNP Growth Rates for the EEC.^a (th. Tr. in m.c.m., in the U.S.S. of 1970)

Desti- nation	Argentina	Belgium- Lux.	France	Germany	Italy	Netherlands	United Kingdom	U. S. A.	Australia	New Zealand	Ireland	Denmark	Rest of Latin Am.	Canada	Rest of the World	Gross Exports	Regional Price
Argentina	..	2.7	9.4	5.8	347.4	19.7	33.2	98.2	..	..	..	..	21.4	20.0	215.0	780.4	569
Belgium-Lux.	..	..	0.1	..	..	4.9	..	..	..	..	..	..	..	..	..	4.9	1,424
France	..	..	..	..	..	4.6	..	..	..	..	..	..	..	..	11.8	16.4	1,425
Germany	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,431
Italy	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,435
Netherlands	..	..	2.3	115.2	..	..	..	..	..	..	..	..	..	..	..	117.5	1,392
U. Kingdom	..	..	2.5	..	..	0.2	..	..	..	..	..	..	..	..	..	3.0	1,188
U. S. A.	..	..	0.2	..	..	0.1	..	..	..	..	..	..	..	13.0	2.9	16.3	1,252
Australia	..	11.7	53.4	..	206.7	..	25.1	1451.4	..	..	..	..	..	4.4	76.6	852.1	835
New Zealand	..	..	0.7	..	148.5	..	22.4	15.2	..	..	..	..	..	..	31.0	249.0	727
Ireland	..	..	15.2	162.6	..	2.4	62.2	..	..	..	..	..	..	..	55.0	298.0	864
Denmark	..	..	6.5	90.3	..	4.2	7.2	..	..	..	..	..	..	..	3.0	111.0	924
R. of the L. A.	..	..	3.3	..	8.4	3.7	..	134.3	..	..	..	..	..	..	61.0	210.4	575
Canada	..	..	..	..	..	..	..	13.4	..	..	..	..	..	..	..	13.4	1,110
Rest of the World	..	..	10.8	5.7	81.8	..	..	..	..	..	..	..	..	..	..	100.4	1,452
Gross Imports	..	14.4	104.4	379.6	794.8	19.9	142.0	762.3	..	..	..	..	21.4	37.4	456.4	..	..
Net Imports	-780.4	9.6	88.0	379.6	794.8	-27.6	159.0	746.0	-852.1	-249.0	-298.0	-111.0	-189.0	24.0	356.0	..	..

^aThe basic run assumed lower GNP growth rates for the EEC countries. The remaining assumptions are identical to those of the basic run.

TABLE 15.--Model Run with High Orientation Prices and Favorable GNP Growth Rates in the EEC. (th. Tm. in m.c.w.t. and real US\$ of 1965)

Origin	Desti- nation)	Argentina	Belgium- Lux.	France	Germany	Italy	Netherlands	United Kingdom	U. S. A.	Australia	New Zealand	Ireland	Denmark	Rest of Latin Am.	Canada	Rest of the World	Gross Exports	Regional Price
Argentina	..	..	2.7	9.4	5.8	307.9	19.9	50.6	88.2	..	..	..	..	21.4	20.0	215.0	740.9	548
Belgium-Lux.	..	..	..	0.1	1.7	..	4.8	..	..	..	..	..	..	..	..	..	6.6	1,341
France	..	..	..	..	..	..	4.6	..	..	..	..	..	..	..	..	11.8	16.4	1,377
Germany	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,383
Italy	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	..	1,388
Netherlands	..	..	..	2.3	167.1	..	..	..	..	..	..	..	..	..	..	..	169.4	1,344
U. Kingdom	..	..	..	2.5	..	..	0.5	..	..	..	..	..	..	..	..	..	3.0	1,148
U. S. A.	..	..	..	0.2	..	..	0.1	..	..	..	..	..	..	..	13.0	2.9	16.3	1,213
Australia	..	..	..	2.2	..	255.9	..	17.7	481.4	..	..	..	..	..	4.4	76.6	838.3	803
New Zealand	..	..	..	0.7	..	50.1	..	23.6	143.6	..	..	..	..	..	..	31.0	249.0	699
Ireland	..	..	..	27.8	73.2	73.7	2.4	120.9	..	..	..	..	..	..	..	..	298.0	832
Denmark	..	..	..	6.5	35.2	..	4.0	7.4	..	..	..	..	..	..	..	58.0	111.0	890
R. of the L. A.	..	..	..	3.3	..	8.4	3.7	..	134.0	..	..	..	..	..	..	61.0	210.4	554
Canada	..	..	..	..	..	..	..	..	13.4	..	..	..	..	..	..	..	13.4	1,071
Rest of the World	..	..	..	10.8	5.7	83.8	..	..	..	..	..	..	..	..	..	..	100.4	1,403
Gross Imports	..	..	2.7	65.8	288.8	779.8	39.9	220.2	860.7	..	..	..	..	21.4	37.4	456.4	2,773.0	..
Net Imports	..	-740.9	-3.8	49.4	288.8	779.8	-129.5	217.2	844.4	-836.3	-249.0	-298.0	-111.0	189.0	24.0	356.0	..	..

*The basic run assumed lower orientation prices and GNP growth rates in the EEC. The remaining assumptions are identical to those of the basic run.

CHAPTER VII

CONCLUSIONS, EVALUATION, POLICY IMPLICATIONS, AND RECOMMENDATIONS

Conclusions

This section will include two types of conclusions: those that have been obtained from the use of the spatial equilibrium model and those obtained on the basis of the analysis performed to satisfy data requirements of the model. Each one will be separately analyzed.

Summary of Conclusions from the Model

The following is the summary of the conclusions obtained from the alternative runs obtained with the use of the SEM:

1. Argentina would find a market of 347,972 Tm. for her beef exports in the EEC and the United Kingdom¹ under "most likely conditions" assumptions to 1975. Total Argentine exports would be 693,000 Tm. of equivalent carcass

¹The conclusions will refer to the EEC and the United Kingdom markets considered together in almost all cases without implying the entrance of the U.K. into the EEC. This presentation tries to avoid distortions that might arise from the distribution of trade flows already discussed in Chapter VI. Point 12 is the only case in which the U.K. is referred to as belonging to an enlarged community.

weight¹ under the named assumptions. (One of them is that Argentina would slaughter animals representing 2,860,000 Tm.)

2. The possibility exists, however, for Argentina to expand her exports to the Community and to the United Kingdom to 380,000 Tm. if she could increase slaughter to approximately 2,900,000 Tm. The total export under this supposition would be 730,000 Tm.

3. The approximate price Argentine producers could expect to receive under the assumptions of the second conclusion is US\$ 275 per liveweight Tm., expressed in real dollars of 1965.

4. Argentina would be displaced to a second position as a world exporter by Australia no matter what alternative assumptions are made. The level of exports estimated for Australia for most of the trials was over the 800,000 Tm.

5. The United States would consolidate its first position as a world importer followed by Italy, Germany, and the United Kingdom. The level of exports estimated for most of the trials was of approximately 900,000 Tm. for the United States.

6. The world demand for Argentine beef seems to have a fairly high price elasticity within the range of Argentine capabilities of increasing production in the near future.

¹Trade and slaughter figures are expressed in equivalent carcass weight terms in the rest of the conclusions.

7. Argentina could enlarge her exports to the Six and the United Kingdom to approximately 464,000 if she were able to increase slaughters to 3,000,000. The global exports under this circumstance would be approximately 810,000 Tm.

8. A doubling of the rate of increase of orientation prices that the EEC enforced between 1964 and 1969 would mean a decline in exports to the Community and the United Kingdom relative to 1966 levels. Exports would reach 1966 levels only because of the increase taking place in other markets.

9. Unfavorable growth rates in the Six up to 1975 would also bring unfavorable prospects for Argentine exports to the EEC and the United Kingdom. Both markets taken together would import only 266,017 Tm. in comparison to the 338,223 and the 347,972 Tm. exported to them in 1966 and forecasted in conclusion 1.

10. The prospects for expanding beef exports to the Community and the United Kingdom are highly favorable under the assumption of a unilateral elimination of EEC "ad valorem" duties in favor of Argentina. Such a reduction would bring the level of exports to both markets to 500,000 Tm. and those of total exports to 846,000 Tm. This, however, is highly unlikely.

11. A reduction of the United Kingdom "ad valorem" duty to 5% would tend to increase Argentine exports to the

United Kingdom by approximately 40,000 Tm. But the increase would be at the expense of exports to the Community to a large extent. The overall increase of exports to the Community and the United Kingdom would be of approximately 7,000 Tm. with respect to conclusion 1.

12. The results obtained by assuming that the United Kingdom, Ireland, and Denmark will enter into the EEC are highly dependent upon the orientation price and the increase in growth rates that might occur in response to such a move. Two alternatives were examined in terms of a high and a low rate of growth of EEC countries (both rates being higher, however, than those used under the set of "most likely conditions"). The two alternatives, on the other hand, used the same supposition of common orientation prices of US\$ 699 (of 1965) per liveweight Tm. for adult cattle.

The results were favorable for Argentina under the alternative of an increase of growth rates for the EEC countries, which would raise rates to the level experienced since the formation of the Community to 1966. The calculated increase of Argentine exports to the Six and the United Kingdom would be approximately 63,000 Tm. with respect to the result presented at point 1. In other words, exports are forecasted to reach a level of 411,000 Tm. Total exports would be approximately 755,000 Tm.

The low estimate of the EEC growth rates still brings a favorable net impact for Argentina that would benefit

from an increase of the exports to the Six and the United Kingdom of approximately 20,000 Tm.

It was calculated that an even average annual increase of the GNP growth rates (with respect to the rates assumed under "most likely conditions") of 0.75 of regions 2-6 would probably be the "equilibrium" differential increase of rates that would tend to compensate the negative effect of lower imports of the United Kingdom with higher imports of the Six. In such a case, the effects of the EEC enlargement would be neutral with respect to the level of Argentine exports to the block.

13. The application of a 25% export tax by the Argentine government shows very unfavorable effects upon exports and prices. The estimated decline of exports to the Community and the United Kingdom is of approximately 100,000 Tm. with respect to the Basic Run.

14. Favorable GNP rates of growth of the Six represent a very good feature for Argentine exports. She would increase her shipments to the Six and the United Kingdom to 435,000 Tm.

15. The combination of a highly protectionistic EEC policy with high rates of GNP growth for the Six would have a net positive effect on Argentine exports. Exports to that region and the United Kingdom would be of 396,000 Tm. with a total of 741,000 Tm. This implies slaughter of 2,860,000 Tm.

Table VII-1 shows the summary of Argentine exports to the EEC and to the United Kingdom and the total exports under the several runs carried out to 1975. The EEC and the United Kingdom have been combined to avoid erroneous conclusions in those cases where trade diversion between both regions takes place. It seems, considering the basic run, that the most favorable effects upon Argentine exports are produced by an EEC elimination of "ad valorem" duties in favor of Argentina, a high level of Argentine slaughters, and favorable rates of growth in the EEC. The first of the alternatives is unlikely because of the discrimination it implies. It can be seen, with respect to the last of the three that the influence of the growth rates is so important that they more than offset the negative effect of high orientation prices. Comments will be made later about the second factor.

The enlargement of the Community under high rates of growth also shows favorable effects over those achieved under the basic run conditions.

High orientation prices in the EEC not compensated by high rates of growth, an Argentine "ad valorem" export tax of 25 per cent, and unfavorable growth rates in the EEC economy proved to be the most unfavorable factors affecting Argentine exports.

The reduction of the United Kingdom "ad valorem" duties in favor of Argentina, although favorable to Argentine

exports to that country, produced a trade diversion away from the EEC so that the overall level of Argentine exports increased by only a small margin. The enlargement of the Community under low rates of growth for EEC countries also proved to have a small effect upon Argentine exports.

Summary of Secondary Conclusions

The analysis developed to satisfy the data requirements of the SEM provided some conclusions that seem worth mentioning. They were mainly obtained as by-products of the analysis carried out to estimate domestic demand and supply functions. Some of these conclusions were:

1. The "income" elasticity for Argentina calculated on the basis of per capita gross domestic product was 0.24. Although this elasticity is considerably higher than that assumed by FAO for consumption projections to 1975 (zero income elasticity) its importance is approximately 50 per cent of the impact of population growth.

2. The price elasticity at the producer level was 0.27. Previous studies for Argentina at the retailer level indicated a price elasticity of about 0.45. The comparison of both figures shows a lower elasticity at the producer than at the retailer level and provides an indication of the application of constant absolute margins rather than constant percentage markups between both marketing stages.

3. It appears that most importance should be given to cattle prices lagged 2, 3, and even 4 years when estimating supply relationships for slaughters or production.

4. Exporting countries suffer more seriously from price variability than importers. It might be hypothesized that the reason for this lies in the fact that importers are better able to cover variability of production and consumption by means of adjustments in their imports. The impact of the adjustment is then passed on to the exports which do not have similar weapons with which to react.

Evaluation of Conclusions Obtained
From the Model

This section will evaluate the results obtained with the help of the spatial equilibrium model. Table VII-1 that included the actual destination of Argentine exports to the EEC and the United Kingdom, and total exports during 1969, as well as the results of the various runs, will facilitate the evaluation.

The main limitation to increasing Argentine exports lies in her production sector. The three different levels of slaughter projected to 1975 of 2,860,000, 2,903,000, and 3,000,000 appeared to be insufficient to satisfy the future needs of the Argentine customers. The results of the Basic Run and of the run with slaughter of 2,903,000 Tm. showed that domestic and foreign demand were strong enough to absorb (at prices relatively high to 1966) the 2,860,000 and 2,903,000 Tm. of slaughters. The third run presented some evidence that a level of slaughters of 3,000 thousand Tm. would produce some decrease in domestic EEC

prices below orientation prices, although not much. But on the other hand, the model run with reduced duties for the United Kingdom provides evidence that the United Kingdom could absorb higher imports from Argentina than those reflected in runs 1, 2, and 3 of Table VII-1. Run 6 of Table VII-1 points out also that trade diversion might take place by a level of almost 40,000 Tm. with the decline of the United Kingdom "ad valorem" duty.

These results lead to the conclusion that Argentina might be able to export approximately 810,000 Tm. in 1975 if she were able to slaughter 3,000,000 Tm. The number of slaughtered animals required to satisfy such a level is approximately 15 million, considering an average dressing weight of 203 kilograms per animal (calculated on the basis of data for 1966-1969).

The slaughter and export figures reached during 1969 might lead one to believe that the proposed goal of 3,000,000 Tm. of slaughter with exports of 810,000 Tm is not very ambitious. The year 1969 saw slaughter of 2,835,000 and exports of 760,000 Tm. A proposed goal of increasing these quantities by 165,000 and 50,000 respectively between 1969 and 1975 may seem very small. However, Figure 1 shows that slaughter reached a peak during 1969. It was a record year for Argentina. Figure 1 also shows important slaughter variations and more violent declines than recessive. Therefore, forecasting under average conditions to a particular

TABLE VII-1.--Summary of Argentine Beef Exports to the EEC and United Kingdom,
and Total Exports Under Various Alternatives to 1975.

Destination of Argentine Exports	1969	(a)	(b)	(c)	(d)	(e)	(f)	(g)	(h)	(i)	(j)	(k)	(l)
EEC + U. K.	368	348	383	464	162	501	353	235	411	358	266	436	396
Total	758	693	727	808	506	846	697	579	755	703	611	780	741

(a) = Basic Run to "1975".

(b) = Model Run with Argentine supply of 2,903,000 Tm.

(c) = Model Run with Argentine supply of 3,000,000 Tm.

(d) = Model Run with higher orientation prices for the EEC increased by an annual 2 per cent with respect to 1969.

(e) = Model Run with no EEC "ad valorem" duties for Argentina.

(f) = Model Run with the U. K. "ad valorem" duty reduced to 5 per cent.

(g) = Model Run with a 25 per cent Argentine Export Tax.

(h) = Model Run with the U. K., Ireland, and Denmark also in EEC, and with high rates of growth of regions 2-7.

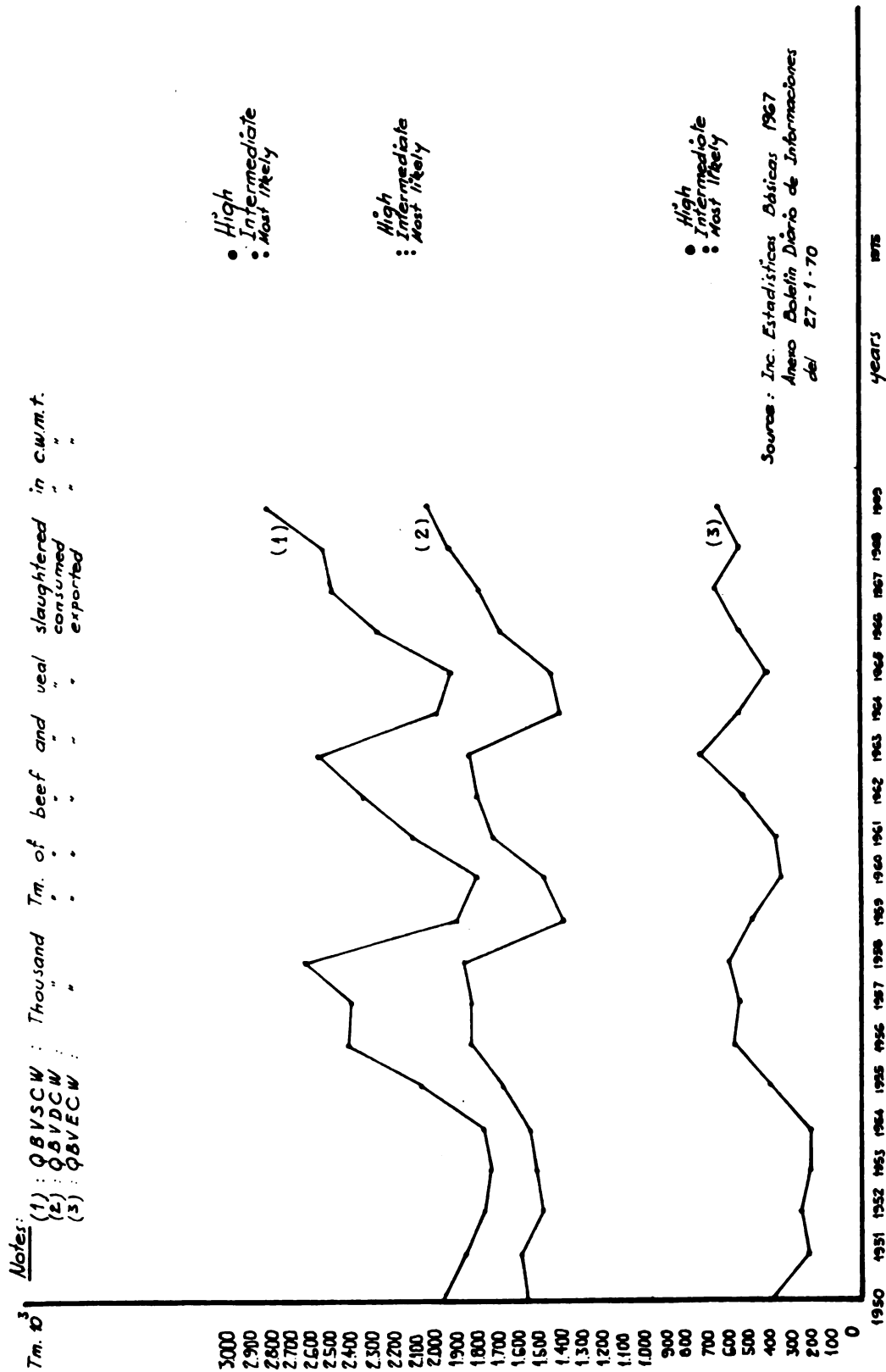
(i) = Model Run with the U. K., Ireland, and Denmark also in EEC, and with GNP rates of growth of regions 2-6.

(j) = Model Run with unfavorable GNP growth rates in the EEC.

(k) = Model Run with favorable GNP growth rates in the EEC.

(l) = Model Run with high orientation prices and favorable GNP growth rates in the EEC.

FIGURE VII - 1 - ARGENTINE SLAUGHTERINGS, CONSUMPTION,
AND EXPORTS, 1950 - 1969



year, 1975 for this study, is not the same as taking into account the specific circumstances that might prevail during 1975. Given the practical impossibility of predicting the specific conditions during that year, it appears better to formulate a goal feasible under average conditions. The proposed target of 3,000,000 Tm. to 1975 is not so low if allowance is made for price declines that might take place during 1971 and 1972, a consequent drop of slaughterings and the classical slow process of recovery between 1972 and 1975. Biological features of beef production do not allow for fast increases and 1975 is not that distant in the future.

On the other hand, targets of slaughters and exports lower than those proposed would tend to reduce the share of Argentine exports in world trade, even with respect to 1966. The 810,000 Tm. would represent 28.5 per cent of the total world trade forecasted to 1975 under model run (3) of Table VII-1, 2,851,000 Tm. Since the Argentine participation during 1966 was 27.3 per cent, the proposed target represents only a slight improvement, but it would keep Argentina below pre-war levels.

Two other factors also come out in defense of keeping the proposed levels as minimum goals. The first is that most of the assumptions made contained a conservative bias from the Argentine point of view because it was thought that a mistake of this nature was less important than running the

risk of forecasting excellent conditions that might not be fulfilled. The second element is that most of the major studies forecasted higher levels of EEC and United Kingdom imports than those of model run (3) of Table VII-1.

The forecast of United States imports also deserves special mention because of its influence upon the price and trade levels of the remaining regions of the model. As previously mentioned, this region tends to consolidate its privileged position as the number one world importer of beef according to the results obtained under the several alternatives analyzed. The projected level for most of them was 911 thousand Tm. that is intermediate to some of the projections elaborated by other studies. The OECD study¹ presents the highest estimate with 1,342,000 while Gruën's² is 850,000 Tm.

The favorable prospects for increasing beef imports in the United States are not good enough, however, to attract all the exporting capability of Australia and New Zealand in 1975. Both show considerable possibilities of increasing their slaughters and exports and the analysis throughout revealed that they will become important competitors of Argentina in the EEC market.

¹OECD, op. cit.

²Gruën, op. cit.

Policy Implications and Recommendations

One of the final conclusions of the study is that Argentina faces favorable prospects for increasing her beef exports to 1975 and that the main limitation for increasing them may rely upon the capability of increasing slaughter in 1975 in a relatively stable fashion. The implication is that Argentina should take important steps to shift her domestic supply function (and consequently supply of exports) to the right and to make it more elastic.

It does not seem enough, however, that the long-run prospects appear favorable. The past has demonstrated that foreign markets may be relatively good for Argentina but that short-run price fluctuations are a negative factor of sufficient importance to frustrate the good long-run prospects. It was analyzed before that the increase of Argentine exports did not increase pari passu with the increase of foreign demand. It was also observed that increased slaughters take a longer time than reductions and that exporting countries tend to experience greater slaughtering variability. A theoretical analysis of price fluctuations would show¹ its negative effects upon beef production. A comparative analysis of price variability for Argentina and other countries showed one of the highest coefficients of variation for Argentine cattle prices during the period 1939-1966. The surveyed

¹Ernesto S. Liboreiro, The Possible Effects of Price Uncertainty on Argentine Beef Production (Unpublished Research Paper, East Lansing, 1968).

prices were for cattle in Australia, the United Kingdom, the United States, and Argentina, and hogs, sheep, wool, wheat, maize, barley, oats, linseed, cotton fiber, pears, and apples in Argentina. A coefficient of variation was also calculated for relative prices between cattle and crops in Argentina. The two highest coefficients belonged to Argentine apples and cattle, with values of 0.99 and 0.80 respectively, while the corresponding values for the remaining prices were far smaller than those of cattle.

It is true that the highly diversified composition of destinations of Argentine beef exports acquired during the last years tends to make Argentine exports less dependent upon foreign demand variations. The higher degree of industrialization achieved by the composition of the Argentine beef exporters also adds greater stability to the overall exports.¹

It is suggested in view of past experience and of the possibility of a market unification between the presently separate EEC and United Kingdom markets that short-run price variability may still be a major negative factor upon regular flows of Argentine slaughters and exports in the future. The theoretical analysis mentioned shows that policies to ameliorate price variability would be helpful to achieve a rightward shift of the supply function and to make it more elastic.

¹The researcher was alerted of the importance of these two factors by Ingeniero de las Carreras.

It is suggested also that the solutions to increase slaughters and exports may very well rely on factors outside the livestock production sector of the Argentine economy. Increasing agricultural production in developed as well as less developed countries depends to a large extent upon the development of the industrial, marketing, and services sector of the economies. The development of suitable inputs, the knowledge about their properties and application, the possibility of their reaching the producer at acceptable prices, the knowledge about management practices concerning small investments, access to credit, relatively stable prices, etc., depend upon the sectors of the economy other than those in the livestock producing sector. The reason for this suggestion is that very often the responsibility for the lack of increased Argentine cattle production has been placed upon the livestock producers alone. The analysis of each one of the mentioned factors would also reveal that those related sectors have not fared very well during the stagnation of livestock production. It might be suitable to analyze more the efficiency of the goods and services provided by the nonform sectors of Argentina and their relationship to agriculture.

Since the United States will probably consolidate its position as first world importer it would be necessary for Argentina to devote considerable efforts to the penetration of that market for chilled and frozen beef. Control of

hoof and mouth disease is one of the main ways to obtain access. Although the United States does not presently recognize the existence of certain regions within a country that may be free from the disease, it would be worthwhile to explore the possibility of arriving at future trade agreements with Argentina upon that basis.

Argentina should continue exerting serious efforts to keep orientation prices and application of variable levies of the Common Market from increasing at higher rates than 1 per cent per year in real terms.

It would be highly desirable for Argentina to obtain a preferential trade agreement with the EEC similar to a reduction of import duties. But it would be of as much importance to obtain trade agreements that would allow for regular exports.

It may be interesting to mention, although perhaps difficult to implement, that the enlargement of the United States quota imports that favor Australia, New Zealand, Ireland, and Mexico is in the interest of Argentina. It should be remembered, in this context, that trade diversion is not only theoretically possible but also empirically verified in the past, and there is no reason to believe that it may not happen again if Australia and New Zealand do not find satisfactory outlets in the United States. It was previously mentioned that it is expected that even under the size of the quota enlargement assumed by the latter country, the countries from Oceania will direct substantial

quantities to the EEC countries. At least it is a matter of not surpassing the expected level of trade diversion.

The following topics are suggested for further research:

1. Composition of future Argentine beef exports. The study carried out deals with total beef exports but it would be useful for exporting firms to know about the different types of products that may compose the total beef exports in Argentina's future.

2. Analysis of the possibility of an agreement with the United States under which Argentina guarantees a zone free of hoof and mouth disease and the USA allows imports of beef from animals from this region.¹

3. Same for the United Kingdom and Japan as (2).

4. Stabilization scheme for short-run fluctuations of beef prices.

5. Improving the specification of the model. The feasibility of using a recursive model for obtaining better estimates of beef slaughterings for the first 9 regions of the model would be a useful contribution. This would also give rise to a need for reestimating the demand functions, which might be more properly considered as price equations. The model regarding trade flows could be improved by elaborating more reliable data on transfer costs.

6. Analyze the possible impact of structural reform policies of the EEC upon agricultural production and consumption to approximately 1985.

¹This possibility was suggested to the researcher by Ing. Agr. Norberto Frigerio.

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