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United States poultry exports to the European Community : the impact of the 1992 greater economic harmonization

Matthew A. Ojo

To the Graduate Council:

I am submitting herewith a thesis written by Matthew A. Ojo entitled "United States poultry exports to the European Community : the impact of the 1992 greater economic harmonization." I have examined the final electronic copy of this thesis for form and content and recommend that it be accepted in partial fulfillment of the requirements for the degree of Master of Science, with a major in Agricultural Economics.

Gregory Pompelli, Major Professor

We have read this thesis and recommend its acceptance:

Dan McLemore, Mary Sue Younger

Accepted for the Council:
Carolyn R. Hodges

Vice Provost and Dean of the Graduate School

(Original signatures are on file with official student records.)

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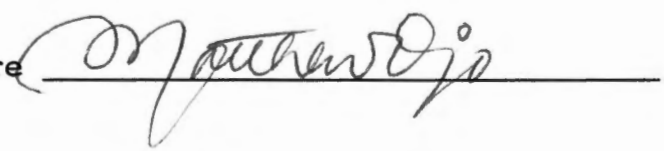
Signature 

Date 05-28-92

UNITED STATES POULTRY EXPORTS TO THE EUROPEAN COMMUNITY: THE IMPACT OF THE 1992 GREATER ECONOMIC HARMONIZATION

A Thesis

Presented for the

Master of Science

Degree

The University of Tennessee, Knoxville

Matthew A. Ojo

August, 1992

DEDICATION

This thesis is dedicated to my mother

Mrs Juliana Ojo

and my brother

Reverend Dr. Emmanuel Ojo-Uranda

who have given me invaluable prayers, support and encouragement throughout my life.

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ABSTRACT

Profitability of U.S. poultry industry is affected by developments in the world markets, although in the past it has appeared to be insulated.

The European Community (EC) is in the process of creating a single, unified European market in 1992. This economic integration will have a significant impact on poultry producers both inside and outside the EC, especially due to the adoption of new standards and the removal of Monetary Compensatory Amounts (MCAs).

The objective of this study is to describe the current efforts to enhance economic integration within the European Community and to analyze how its implementation may affect the U.S. poultry industry. This was accomplished by estimating the demand for U.S. poultry in the five largest EC importing nations which accounted for 54 percent of total value of U.S. poultry exports to the EC, and the rest of the EC as an aggregated group. The sum of their poultry demand was incorporated in a U.S. export supply function to determine the effect of changes in EC demand on the U.S. export price.

The results indicate that the EC's domestic poultry prices EC have a greater impact on poultry exports than the U.S. export price. The results suggest that harmonization of prices that lead to a 1 percent fall in poultry prices will result in a 1.6 to 2.7 percent fall in the quantity of

U.S. poultry demanded. However, U.S. export prices are not expected to be greatly affected.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

CHAPTER 1

INTRODUCTION

Historically, the United States poultry industry has been insulated from developments in international markets. Nonetheless, the economic well being of the U.S. poultry industry is becoming increasingly influenced by developments in world markets. As a result, U.S. poultry producers must recognize how changes in world markets affect the domestic poultry industry. Thus, this study examines the extent to which the economic harmonization in the European Community (EC)[1] may affect the potential for the U.S. poultry exports to the EC market.

Under the labels "Greater Economic Integration," and "1992," the EC is in the process of eliminating most, if not all, internal restraints to trade by December 31, 1992. These restraints include free movement of goods, people, services and capital within the EC. However, the adoption of new standards and regulations that may affect U.S. export opportunities for poultry and poultry products in the EC is of concern to U.S. poultry exporters. Even if European economies achieve only partial harmonization, the results

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[1]European Community (EC). Also referred to as the Community. An economic customs union originally composed of six members - Belgium, Luxembourg, France, Italy, West Germany, and the Netherlands. Denmark, Ireland, and the United Kingdom (UK) became members January 1, 1973. Greece joined January 1, 1981. Spain and Portugal became members January 1, 1986. EC refers to the present Community of 12 nations.

could be significant for the U.S. poultry industry. One example of the possible impacts is the 1989 directive that banned the use of growth hormones in livestock production. This directive resulted in U.S. beef producers losing an estimated $100 million in beef exports to the EC (Sherer, 1990). American producers are already aware of the implications of European harmonization. However, further analysis is needed to assess future implications. Previous studies have examined the EC's export subsidies, grain policies and the elimination of these programs on U.S. poultry trade (Alston, Alston and Scobie, and Gleckler and Tweeten). However, they did not examine the effects of harmonization of the EC poultry support prices on U.S. poultry trade.

In examining the implications of the 1992 economic harmonization programs, the current efforts to enhance economic integration within the European Community will be described. The main objective, however, is to analyze how the implementation of the economic harmonization program will affect U.S. poultry exports to the EC. This will be accomplished by first estimating quantity demand for U.S. poultry in the five largest markets in the EC (West Germany, Greece, Italy, Netherlands and U.K.). Second, quantity demand for U.S. poultry by the minor markets, comprising the rest of the EC countries will be estimated as an aggregated group. U.S. poultry export quantity and price to the EC

will, respectively, equal the sum of the quantity demand for U.S. poultry, and the average price to all the EC markets. Last, U.S. export price of poultry to the EC will be estimated to determine principal influences affecting U.S. exports of poultry to the EC.

The results of this study will provide a tool for both policy makers and poultry exporters to enable them see the possible direction of U.S. poultry trade with the EC after the harmonization program.

CHAPTER II

BACKGROUND

The political institutions in the EC recognized the need for improvements in the farming sectors of member states. This recognition led to the implementation of the Common Agricultural Policy (CAP). CAP was designed to regulate the production and movement of agricultural and food commodities into, within and out of the EC.

Article 39 of the Treaty of Rome, 1957, stated the objectives of the CAP to include :

1) Increasing agricultural productivity through technical progress and optimum utilization of labor; 2) maintaining a fair standard of living for the rural population, by increasing earnings of persons in agriculture; 3) stabilizing the EC markets through common price supports; 4) ensuring consistent supplies of agricultural commodities; and 5) ensuring reasonable consumer prices.

The CAP has attempted to achieve these objectives using complex agrimonetary systems and various price support mechanisms. The agrimonetary systems comprise the Unit of Account (UA), the Green Rates and the Monetary Compensatory Amounts. The CAP's price supports include the domestic, import and export mechanisms.

The European Agrimonetary Systems

The EC established the "Unit of Account" (UA) in 1962. The UA was used as a monetary denominator for fixing policy prices and other financial transactions of the CAP. It was defined as the amount of gold (0.88867088 gram) equal to the value of a U.S. dollar. EC policy prices, subsidies and other monetary aggregates in UA were converted into each country's currency by a set of Agricultural conversion rates. At first, the rates were based on the market exchange rates, and changes in the market exchange rates were reflected by equal changes in the conversion rates. This arrangement guaranteed the same level of policy prices throughout the Community, irrespective of the currency in which they were expressed. The CAP's objective of common prices was therefore satisfied, at least temporarily.

Unfortunately, the breakdown in the system of fixed exchange rates in the early 1970's resulted in : 1) a set of rates that differ from market rates; 2) the breakdown in common pricing; 3) system of border taxes and subsidies that distorted trade patterns; and 4) large administrative costs to the Community.

"Green Rates"

The breakdown of the system of fixed exchange rates in the early 1970's was followed by exchange rate adjustments for some EC countries. To prevent the transmission of

exchange rate changes into their agricultural prices, countries such as France and Germany sought reprieve from the common pricing system. They were allowed to use the old exchange rates to convert CAP price supports into national currency. Hence, the birth of "green rates," conversion rates different from the market exchange rates. The result was disparity in various support prices between EC member countries. Compensating systems of taxes and subsidies on agricultural products were applied at borders to stabilize differences in support prices. Consequently, prices for agricultural products varied within the EC, thus, negating the objective of common prices.

Monetary Compensatory Amounts - MCAs

Had the market been allowed to adjust itself, producers in countries with lower prices would have exported their commodities to countries with higher prices. Eventually, prices in the EC would have come to equilibrium. Instead, border taxes and subsidies known as Monetary Compensatory Amounts (MCAs) were established. MCAs act as taxes on exports and subsidies on imports of weaker currency countries, and as subsidies on exports and taxes on imports of stronger currency countries.

In general, prices in EC nations vary due to differing production costs and the protection efforts. These price variations were, in part, the results of the CAP's

agrimonetary systems. Various price support mechanisms were introduced to relax the effects of the agrimonetary systems and facilitate market stability.

CAP's Price Support Mechanisms

Figure 1 illustrates the principal components of the CAP's price support mechanisms. The Council, the EC decision making body, used the UA to set CAP's target prices for agricultural products and also establish intervention prices that guarantee minimum producer prices at which government agencies would intervene and buy the products for Community storage. These prices form the range of domestic price level, and make up the principal domestic producer price support mechanism. MCAs are approximately equal to the difference in the intervention prices between countries (Swinbank).

The Sluicegate Price (SGP), together with various Import Levies are the import mechanism used to protect EC producers from imported poultry. SGPs are set quarterly by the EC Commission. The SGPs are the minimum prices at which non-EC poultry may reach an EC port of entry. They are based on the cost of production of broilers in a typical non-EC country that exports broilers to the EC. To keep producer prices above Intervention and close to Target price, importers are charged various import levies on top of the SGPs.

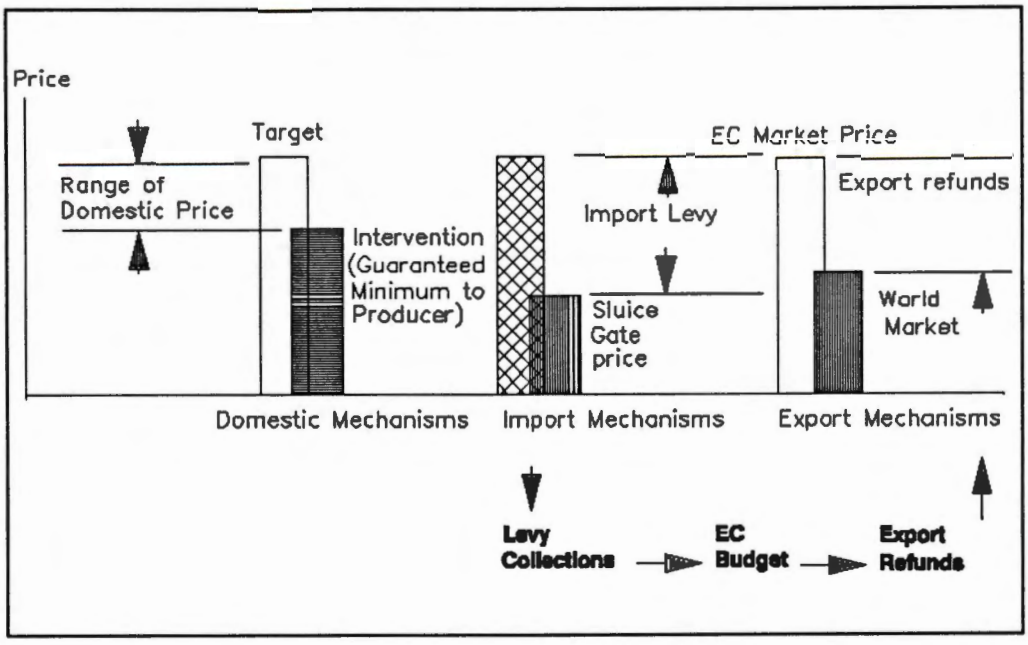

Figure 1 CAP PRICE SUPPORT MECHANISM

Source: Adapted from The Basic Mechanisms of European Community (EC) Farm Policy. USDA, ERS Miscellaneous Publication No. 1285.

Basic Import Levies are calculated quarterly. There are two components. The first is an equalization fee. It is the difference between the value of the amount of feed grain required to produce one kilogram of broiler in [say] West Germany, and the value of the same amount of feed grain at the world market price. The second component is an amount equal to 7 percent of the SGP in effect during the previous 12-month. Additional Variable Levies are set when import prices fall below the SGP.

Exporters are paid refunds to sell excess EC products at world prices. Export Refunds constitute the Export mechanism, and are based on the difference between the

internal EC market price and the world market price at ports where the EC exports. Export refunds are paid from the EC budget which is primarily funded by import levies collected.

The CAP, while attempting to achieve its objectives, has increased European agricultural production and trade. On the other hand, it has increased production cost, inflated domestic prices and subsidized exports. CAP's policies have protected European markets from outside imports. This protection has developed at the expense of the EC consumers who have sustained the cost of protection by reducing their consumption. Non-EC poultry producers have also been affected by the surpluses in the EC which have been placed on world markets, causing prices to fall.

Table 1 presents poultry producer prices in the leading producing nations. It shows that the EC has the highest producer prices among the leading producing nations.

Table 1 Producer Price of Poultry ($/ton)*

Country	1982	1983	1984	1985	1986	1987
EC	1223	1176	1113	1391	1566	1801
Japan	1010	1014	1043	1119	816	666
U.S.A.	839	879	1056	973	1072	878
Brazil	703	618	679	591	732	588

*At commodity-specific exchange rate.

Source: Estimates of Producer and Consumer Subsidy Equivalents. USDA, ERS Statistical Bulletin No.803, April 1990.

By the mid 1970s and continuing into the 1980s protectionist measures such as nontariff trade barriers became the common part of intra-EC trade relations. As the internal trade barriers grew, trade and economic growth diminished, and the term "Eurosclerosis" was coined.

The 1992 Initiative

Most European leaders realized that internal protectionist measures were to blame for at least part of the EC's economic problems. The Single European Act was passed in 1985. Known as the "1992" initiative, the Act's main objective was to harmonize the regulations that control economic activities within the EC. The Act was developed to bring various national support prices under a uniform EC support price. In addition, the Act would remove nontariff barriers within the EC, and bring the community closer to the ideal of a unified customs union. The expected benefits included greater production efficiency, possible reductions in national monopolies, and increased access to goods and services to people in the EC. Leon and Mahe have noted that the 1992 measures are expected to affect the environment of the EC's Common Agricultural Policy (CAP), but not the CAP directly.

If the 1992 harmonization program is to be realized, most agricultural incentives must be abolished. It is also imperative that the EC:

1) End collection of MCAs at the borders to achieve uniform prices within the Community; 2) scrutinizes all national programs, including quotas and national production incentives from conflicting with the 1992 program; 3) harmonizes taxes on agricultural inputs and products; 4) harmonizes regulations in economic sectors that affect agricultural production and income; and 5) harmonizes food safety, plant, and animal health regulations.

The removal of these incentives in the EC will reduce distortions in agricultural commodity trade and permit more efficient allocation of scarce resources. Producers will be encouraged to adopt techniques that improve food production and compelled to become more efficient to compete in the global markets.

CHAPTER III

EC POULTRY PRODUCTION AND TRADE

Poultry meat production in the EC has been on the increase over the past 20 years. Currently, EC's production is about 63 percent of U.S. output. (USDA March, 1990). The four major EC producers are France, the U.K., Italy, and Spain. France accounts for 24 percent of total poultry produced in the EC. Exporting 28 percent of total production, France has been the world's leading exporter of poultry for several years. During 1988, the EC countries exported a total of 2.17 billion pounds of poultry meat of which 60 percent went to other EC countries. The meat directives, issued in the 1980s, provided uniform food safety, and plant and animal regulations for the EC. Different health and sanitary inspection standards of meat packing plants of member countries were harmonized under the umbrella of the EC. The directives also required that meat imports be limited to those plants with health and sanitary inspection systems and regulations that are at least equal to those of the EC. Other directives prohibited production and importation of meats derived from animals treated with growth hormones. Figure 2 shows that the EC has been successful in going from net importer to net exporter of poultry since 1972. Over-production of agricultural commodities has been largely due to income supports offered by the Common Agricultural Policy.

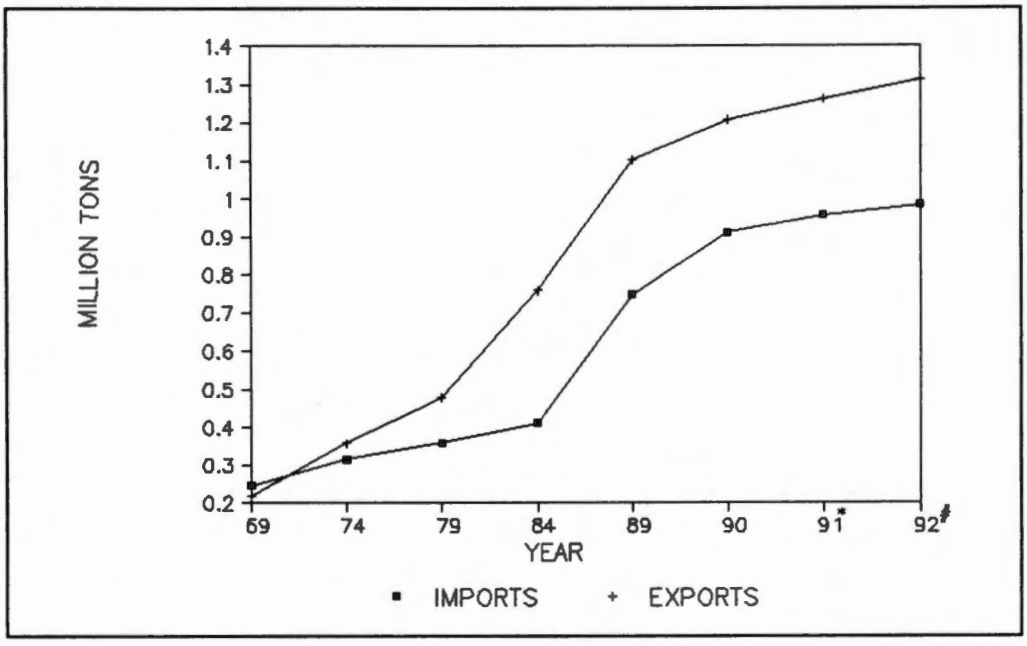

Figure 2 EC IMPORT AND EXPORT OF POULTRY

Note: *Preliminary; #Forecast. Data prior to 1989 represented by 5-year averages.

Source: Dairy, Livestock, and Poultry: World Poultry Situation. USDA, FAS Circular Series: FL&P 3-91 August 1991.

Although EC poultry production has increased, consumption has not kept pace with production, largely because of high prices and lower quality. In general, farm subsidies offered by CAP have led to excess supplies of most livestock, including poultry. As a result, exporters are offered financial supports by the EC to dispose of excess supplies. By protecting the internal markets from non-EC poultry, the EC has been able to increase intra-EC poultry trade. Table 2 shows the flow of poultry within the EC during 1986 to 1990. The table indicates that most of the poultry flowing within the EC is from other EC countries.

Table 2 FLOW OF POULTRY MEAT INTO EC*

(1000 Metric Tons in Ready-to-cook Equivalent)

Source	1986	1987	1988	1989	1990
EC-12#	339.0	350.0	387.0	398.0	464.0
Hungary	31.0	36.0	39.0	10.0	31.5
U.S.	12.4	14.6	17.7	18.1	26.9
Brazil	17.7	8.7	11.1	11.1	16.8
Thailand	0.9	0.7	1.8	2.0	16.1

*Includes intra-EC trade and major third country export of poultry to the EC. #Represents intra-EC trade.

Source: Dairy, Livestock, and Poultry: World Poultry Situation. USDA, FAS Circular Series FL&P 3-91, August 1991.

While non-EC producers have supplied less than 15 percent of the total poultry flowing into the EC, United States producers have supplied less than 5 percent. Producers are highly protected from inexpensive imports from outside the EC through various protective import programs. EC's protective price supports for poultry and other major agricultural commodities are the highest among the major agricultural producing nations. These programs have also kept internal poultry prices well above world levels. With production subsidies and export refunds on the increase (Figure 3), EC consumer prices have averaged more than twice the U.S. level during 1987-88.

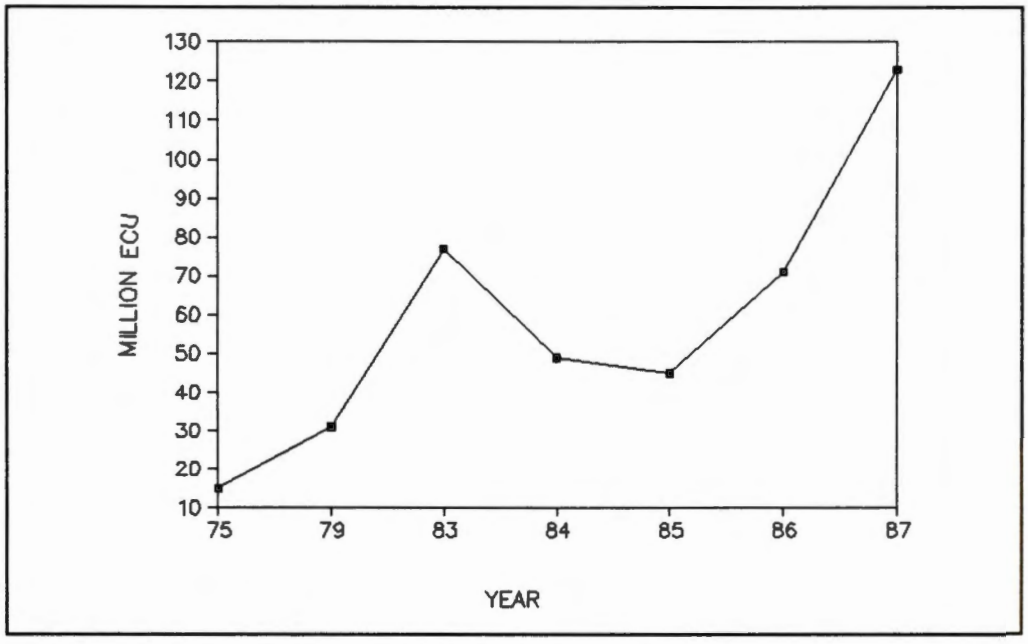

Figure 3 EC EXPORT REFUNDS FOR POULTRY

Note: Data for 1975 and 1979 represents 5-year averages.

Source: Agricultural Statistics of the European Community, 1960-85. USDA, ERS Statistical Bulletin No.770.

Implementation of the 1992 harmonization reforms, according to Kelch (1989), would result in a single price for agricultural products throughout the EC. Movement toward harmonization will affect the EC agriculture. For instance, elimination of green rates will bring grain prices to equilibrium in the EC. Poultry production will be affected as feed prices fall.

Poultry producers in the EC will benefit from lower feed costs and increase their production. Consumption may increase due to lower internal poultry prices. However, the elimination of producer incentives may also reduce production as inefficient producers collapse.

Impacts on U.S. Poultry Industry

Even though CAP's policies have strengthened European agriculture through various production and marketing subsidies, they have distorted the world market for agricultural commodities. Over the years, U.S. poultry exports have declined to less than 10 percent of production. At present, less than 4 percent of the total value of U.S. poultry exports goes to the EC (Figure 4).

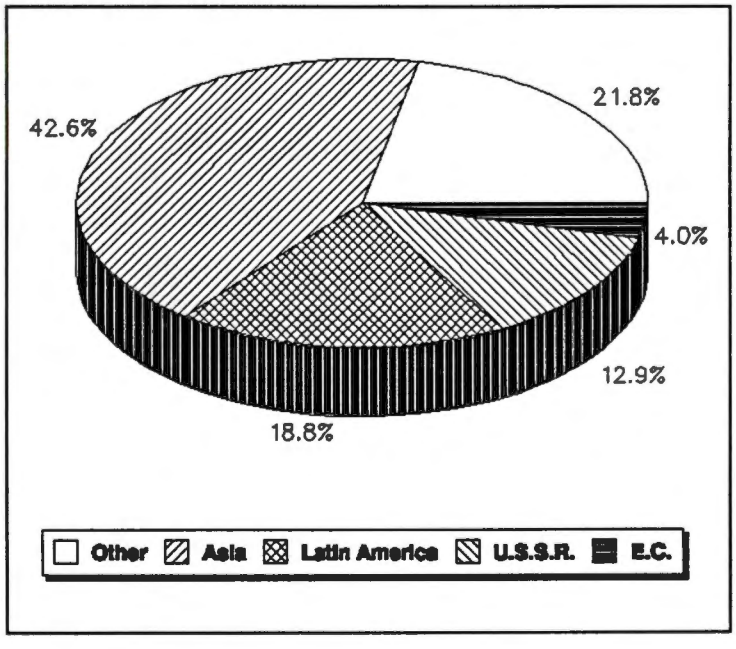

Figure 4 U.S. Poultry Meat Export Value by Destination (Percentages)

Source: Adapted from Dairy, Livestock, and Poultry: World Poultry Situation. USDA, FAS Circular Series: FL&P 3-91. August 1991.

The EC countries, particularly France, have been exporting more than 25 percent of their poultry production. Not only has the EC displaced U.S. poultry exports from the European markets, the EC has also displaced the U.S. from other markets, particularly, from the Middle East markets.

The overall impacts of the harmonization of Europe will involve three general effects. The first effect will consist of trade creation opportunities for firms within the Economic Community. Trade between EC nations will increase with the removal of trade barriers. EC nations with comparative advantages in the production of certain goods will benefit from increased demand. Increased intra-EC trade may displace non-EC countries.

A second effect will involve trade diversions for firms and nations outside the EC. In one case, the removal of interior trade barriers and constraints will cause EC nations to trade with other Community nations rather than with countries outside the Community. In the second case, trade diversion will result from the loss of special trading arrangements that some countries outside the EC enjoyed with individual nations in the EC.

The third effect of the harmonization will result from product substitution due to changes in relative prices of goods within each EC country. How open a nation's food supply was before 1992 and the impact of loss or addition of markets, will determine the extent of product substitution.

The net benefit will be trade diversion to efficient producers. U.S. poultry producers may benefit as they have higher feed conversion rates and lower cost of production than the rest of the world. The level of harmonized prices, however, is crucial if the U.S. is to enjoy the benefits of liberalized trade. Prices harmonized at the high levels, would require trade barriers to prevent entry of inexpensive imports from the rest of the world. In this case, U.S. producers will be displaced from the EC market completely. But if prices are harmonized at the world levels, then the EC poultry market may be opened for U.S. poultry. For at the world price level, EC will not need market protective programs to stabilize price. EC producers would need to become more efficient to compete with non-EC producers.

CHAPTER IV

U.S. POULTRY PRODUCTION AND TRADE

Poultry meat is a major source of animal protein. World poultry production accounted for 22 percent of all meat produced in 1988. The United States produced 28 percent of the total world production of about 73 billion pounds. Most states in the U.S. produce poultry, however, Alabama, Arkansas and Georgia are the leading producers. Most producers are vertically integrated firms with access to adequate capital and research and development techniques (USDA, March 1990).

While the number of firms engaged in poultry production has declined, total poultry production has increased rapidly. Factors leading to the rapid increase in U.S. production include, technical advances, organizational restructuring, and increased consumer demand (USDA, March 1990). Efficiency in feed conversion has allowed lower production cost and lower prices for consumers. Modern production innovations enable producers to enjoy the benefits of economies of scale. United States producers have an advantage over their foreign competitors in the adoption of new production techniques to meet increased demand at lower cost because of their access to adequate capital and research and development techniques.

Direct production subsidization by the U.S. government has been minimal, compared to production subsidies paid by

the EC. Subsidized loans, government research, inspection services, and special tax provisions are the major U.S. government support programs. As a result, during the period 1982-87 the aggregate measure of government support, the Producer Subsidy Equivalent (PSE), for poultry averaged 10.2 percent (Table 3). PSE for poultry is among the lowest for U.S. agricultural commodities. The PSE over the same period for 12 major commodity market basket averaged 26.2 percent. The EC's and Japan's PSEs for poultry for the same period averaged 31.3 and 22.5 percent, respectively. EC has significant involvement in poultry production in the form of production and export incentives to producers and exporters respectively.

Table 3 Producer Subsidy Equivalents for Poultry Meat*

Country	1982	1983	1984	1985	1986	1987
EC	22	33	25	30	34	44
Japan	25	23	23	21	21	22
U.S.A.**	5	5	5	6	14	26
Brazil	8	12	5	4	1	2

*As ratio to producer's value.

**1986 and 1987 figures are due to the introduction of the Export Enhancement Program.

Source: Estimates of Producer and Consumer Subsidy Equivalents. USDA, ERS Statistical Bulletin No.803, April 1990.

Trade distorting policies were virtually non-existent in the U.S. poultry industry until the announcement of the Export Enhancement Program (EEP) on May 15, 1985.

For poultry, the purpose of EEP was to help U.S. exporters meet the challenges posed by subsidized competitors, particularly the EC, in major U.S. markets. EEP has helped to increase U.S. poultry exports. About 24 percent of all U.S. poultry exports during 1987 occurred under EEP (USDA, March, 1990).

Trade with the EC

Agricultural trade is an important part of U.S.-EC trade relations. However, its importance fluctuated significantly in the 1980's. U.S. exports of agricultural products to the EC totaled $2.3 billion in 1970, peaked at $11 billion in 1980, and fell 41 percent to $6.5 billion by 1985 (Farmline).

Exports have provided the needed avenues to relieve the United States' market of excess broilers. Reportedly, 4 million pounds of broilers were exported in 1945. Export figures had reached 180 million pounds by 1960. Exports to West Germany alone increased from 4 million pounds in 1956, to 152 million in 1962 (Talbot, R.B). Large shipments were also exported to Netherlands, France, Italy and Belgium-Luxembourg. United States broiler exports to the EC have suffered considerably over the years. Denmark and some

Eastern European countries have competed with the U.S. for the EC market. Protectionist measures have eroded the U.S. market shares in the EC and other markets. Today, U.S. poultry exports to the EC represent less than 4 percent of total poultry exports. United States Department of Agriculture (USDA) reported that, the value of poultry exports to EC was down 45 percent during the period 1961-63. The value declined again by 45 percent during 1965-1967.

Nevertheless, United States continues to be the world's leading producer of poultry (Table 4). Advances in technology and industrial reorganization have resulted in a more efficient poultry feed conversion in the U.S. than in the major EC producing countries. This has reduced cost of poultry production considerably.

Table 4 MAJOR WORLD PRODUCERS OF POULTRY MEAT

(1,000 Metric tons in ready-to-cook equivalent)

Country	1987	1988	1989	1990	1991*	1992#
U.S.A	9,105	9,426	10,105	10,878	11,387	11,838
EC-12	5,869	6,093	6,298	6,512	6,650	6,755
U.S.S.R.	3,126	3,184	3,300	3,300	3,250	3,200
CHINA	2,040	2,744	2,840	3,229	3,600	4,000
BRAZIL	1,865	1,997	2,139	2,416	2,643	2,780

*Preliminary; #Forecast.

Source: Dairy, Livestock, and Poultry: World Poultry Situation. USDA, FAS Circular Series: FL&P 3-91 August 1991.

CHAPTER V

LITERATURE REVIEW

This chapter reviews studies that have examined the basic issues surrounding the 1992 harmonization programs. In general, the elimination of obstacles to free internal trade and full implementation of the 1992 program will have significant impact on the European economic growth. Most of the studies to date, reflect the general focus on industries other than agriculture because many of the changes of EC harmonization will occur in non-agricultural industries.

As noted, the effects of EC 1992 on United States exports of poultry have received little attention. Although several authors have investigated the impact of 1992 on the EC and its trading partners, most have not explicitly looked at the effects on the agricultural markets.

The most extensive study to date is the Cecchini Report. It was prepared for the EC Commission in 1988. According to the report, implementation of the 1992 program would increase the Gross Domestic Product (GDP) of the EC between 3.2 and 5.7 percent over a period of five to ten years. It would reduce consumer prices between 4.5 and 7.7 percent. The 1992 program would also create between 1.3 and 2.3 million new jobs to improve the labor market. Expansion in economic activities would result in increased government budget revenues by 2.2 percent of GDP. Trade balance would

improve between 0.7 and 1.3 percent of GDP.

Smith and Venables examined the effects of EC 1992 harmonization program on some industries. They used industry simulations to study the effects and the size of the effects of changes in the internal markets of the EC. The models used were partial equilibrium models that imposed imperfect competition and economies of scale. The study showed that the EC 1992 initiatives would have two principal effects on economic welfare. The first effect would increase competition, expand the range of products offered to consumers, and reduce prices. The second effect may result from changes in the size of firms which would lead to better realization of the advantages of economies of scale.

The study tested two different policy experiments. In the first policy experiment, Smith and Venables reduced trade barriers between member states. They observed that this policy increased the volume of intra-EC trade. It promoted competition and expanded import penetration in each national market. They found increased firm scale, lower average cost, and modest welfare gains in each of the ten industries studied. However, they said, the size of these gains depended on returns to scale, the importance of trade and the degree of concentration in each industry.

The second policy experiment considered firms acting in an EC-wide integrated market, rather than in a segmented national market. The monopoly power of a firm in a

particular market (for example, the domestic market), was replaced by its average monopoly power in the EC. In this experiment, they found larger welfare gains in some of the industries studied than in the first.

According to Smith and Venables, the second experiment more realistically simulated the achievement of "completing the internal market" than a mere reduction in trade barriers. However, they questioned the meaning of the second policy experiment. The benefits of the second experiment are not feasible given the existing national trade restrictions imposed by individual EC members, together with the accompanying article 115[2]. They maintained that, in practice, actual EC policy may be some combination of the two policy experiments. They concluded that, moving the EC closer to being a full custom union would result in modest welfare gains. They stated however, that, more significant welfare gains can be derived from the creation of a genuinely unified European market.

Jacquemin and Sapir believed that structural factors were responsible for the relative slowdown in intra EC trade. They analyzed intra-Community trade and studied the structural determinants of European competitiveness. Intra-Community trade was modeled as the ratio of intra-Community imports to total (that is, intra- and extra-Community)

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[2]Article 115 of the Treaty of Rome permits countries to suspend the free circulation within the EC of extra-EC imports, in order to support national import restrictions.

imports. Inter- and intra-industry determinants, barriers to trade, and industry responses to growth in demand were explanatory factors. Their model distinguished factors that influence intra-EC trade between those that result in trade creation, and those that lead to trade diversion. They found that intensive human capital and skilled labor, physical capital, and research and development all contributed to high levels of intra-Community imports, but they also provided resistance to increased extra-Community imports. They mentioned that, on one hand, factors intended to capture the common external tariff and agri-business policies were conducive to intra-Community trade. On the other hand, intra-Community trade was promoted at the expense of greater integration into world competitiveness. Their results implied that existing EC policies have created trade diversions. They proposed that EC policies should strengthen the influence of the human capital and skilled labor, physical capital, and research and development, and called for gradual end to the common external tariff and agri-business policies. Jacquemin and Sapir opposed temptations to create a system designed to defend intra-EC trade against the progress of world free trade.

Winters examined several international trade policy issues within a completed European internal market. One was the impact of prohibiting members from erecting inter-member trade barriers. Another was, the potential dangers of

members resorting to subsidy-based protection in the enforced absence of border measures. He also examined the proposition that some internal barriers were desirable to reduce the degree of trade diversion entailed by the custom union.

On the first issue, Winters noted that the practical concern was the abolition of existing non-optimal barriers to trade. He believed that free trade was preferable to the present situation. According to Winters, many of the EC's internal barriers have either been introduced or maintained at the dictates of the pertinent industries. Winters argued that, because industries have influence in the policy process and institutions in EC, elimination of internal barriers to trade would result in considerable benefits for the EC.

On the second issue, Winters argued that strict measures are needed to prevent member states from replacing border restrictions by national subsidies. Finally, Winters stressed the current large subsidies and significant competition between member states. He pointed out, that in an economic union with free factor mobility, the costs of subsidies increase. Even if the costs could be justified, independent policy-making by member states leads to extended subsidy wars and over-subsidization. He concluded that, EC must abolish subsidies and eliminate barriers to intra-EC trade.

Other studies have looked at the effects of the 1992 harmonization on producers outside the EC. Demekas et al. examined the effects of CAP, on the EC member states and the rest of the world. Demekas et al. indicated that, the effects of CAP on the EC member states included welfare gains and losses of producers, consumers and taxpayers. They also included effects on other sectors and the deadweight costs to the whole economy. The effects on the rest of the world included instability of world commodity prices, and distortion of the volume and pattern of international agricultural trade.

The study by Demekas et al. used multi-sector models to analyze EC 1992 effects on most of the CAP commodities. They found that large amounts of price supports paid by CAP to farmers were inefficient. They estimated price supports resulted in deadweight losses of about 1 per cent of the Community's GDP. Demekas et al. noted that losses were not distributed evenly among member states. Other sectors of the economy incurred costs as resources were diverted away from them and their exports reduced. The study also showed that, traditional welfare calculations underestimated the true social costs of operating the CAP.

CAP's price supports had made the EC become a net exporter of most temperate zone commodities. The result of the EC commodity surpluses had been to lower and vary world prices. They saw that this effect was especially clear in

heavily protected sectors such as wheat, coarse grains, ruminant meat, and dairy products. Demekas et al. suggested multilateral reduction of protection in agricultural markets as a better alternative to unilateral trade liberalization with production incentives.

Nobody knows the level at which prices will be harmonized in the EC. However, the common belief is that prices after harmonization will fall between the low UK level and the high Italian level. Gleckler and Tweeten used three levels of prices to study the effects of each on U.S. food prices, production, consumption, trade with the EC and intra-EC trade. They used the low UK prices, the high Italian prices, and an average of the EC prices. Their study used a world trade model (SWOPSIM) developed by the United States Department of Agriculture (USDA) to model 11 agricultural commodities, including beef and pork. Constant elasticities of supply and demand equations were used for each of the commodities studied. They included the 12 EC member countries, the United States, Japan, and a rest-of-world residual in the study. In each case, they assumed competitive markets and homogeneous commodities.

The results of the Gleckler and Tweeten's study showed considerable impacts on U.S. beef and pork production and prices depending on the level at which EC prices are harmonized. Lower prices in the EC without price supports for producers might lead to the collapse of inefficient

producers; consumption would increase, and EC's export capacity reduced. Harmonization at the high Italian price would reduce internal consumption, cause surpluses to build up, and lead to increased export capacity. The analysis presumed a free, harmonized EC market, where MCAs and green rates have been eliminated to remove market protection.

For harmonization at the low UK price level, the results predicted 2.14 percent increase in U.S. beef prices. U.S. beef production increases by 1.29 percent as producers gain additional markets. Beef consumption in the U.S. falls by 0.77 percent as a result of the increase in price and beef trade increases by 238 thousand tons. Harmonization at the high Italian price level results in a fall in beef prices by 1.76 percent and a fall in production by 0.46 percent. U.S. beef consumption increases by 0.40 percent and trade in beef falls by 99,000 tons.

In the case of pork, harmonization at the low UK price level increases U.S. price by 4.60 percent and increases production by 4.34 percent. Consumption falls by 1.98 percent and trade in pork increases by 413,000 tons. Harmonization at the high Italian price level decreases U.S. price by 12.55 percent and reduces production by 11.01 percent. Consumption increases by 6.12 percent while trade in pork falls by 1.1 million tons.

Harmonization at the EC average price level showed little impact on U.S. domestic prices, production,

consumption and trade.

Gleckler and Tweeten's study show that higher prices in the EC would require protectionist measures to prevent the entry of inexpensive commodities from outside the EC. Accordingly, it would be difficult for U.S. producers to enter the EC market if the harmonization program leads to increased protection. The outcome would be excess supply in the U.S. market. Domestic prices would fall and consumption increase.

Alston and Scobie used two approaches to examined the effects on the United States of eliminating CAP policies on poultry production, consumption and trade. In the first approach, poultry meat was treated as a homogeneous product. The second approach treated poultry meat as being differentiated by region of origin. They found the two models to be identical, and said whether poultry meat is regarded as homogeneous or differentiated by consumers is an empirical question. The results indicated a fall in EC exports of poultry of between 95 and 200 percent. The study showed between 2.5 and 16 percent drop in poultry production. This study found that, eliminating CAP's poultry policies reduced EC domestic prices by 11 percent and raised EC domestic consumption by 6 percent. Through trade effects, these results would have impacts on third countries. For the United States, Alston and Scobie reported an increase of between 1 and 10 percent in U.S.

poultry production, and 27 to 200 percent in poultry exports. Alston and Scobie believed the absence of the CAP policies on poultry would result in a 20 percent increase in total U.S. poultry exports. U.S. poultry production would increase by 0.8 percent. EC's production would fall and exports to major markets would cease. Thus, the EC would become a net importer of poultry.

Gleckler et al. and Alston et at., have provided important analysis of the impact of EC harmonization on U.S. livestock, based on the elimination of CAP programs that affect production, consumption and trade. However, the effects of EC 1992 on U.S. poultry export prices remain unknown. Harmonization of various prices under the umbrella of the EC will impact on the export price of the United States'. U.S. export price would have to adjust to the level of the harmonized EC price.

CHAPTER VI

METHOD AND PROCEDURES

The general methodology used to analyze foreign markets for U.S. agricultural commodities assumes perfectly competitive markets and product homogeneity. Trade distortions due to increased support prices, together with border taxes and intervention policies, have led to the development of various empirical models that relax these assumptions (Dent, Sarris and Thompson). A simultaneous equation model is often used to estimate price responsiveness of demand for agricultural exports.

The basic idea of the model used in this study is that EC poultry prices represent equilibrium results of the EC domestic supply and demand equation. That is, EC prices fully capture all the market information applicable to the supply and demand in the EC domestic markets. The EC quantity demand for U.S. poultry is considered to be a residual factor that does not affect EC prices because less than 5 percent of the total poultry consumed in the EC comes from the United States. Thus, U.S. poultry export prices do not affect, or minimally affect the prices in the EC markets. This will be especially true during the adjustment period for the 1992 harmonization when EC policymakers will be pressed to ease the adjustment shocks for agricultural production. The implication is that poultry imports from

outside the EC will be lessened to protect internal EC prices from lower world prices. This is already occurring because, currently, U.S. poultry exports to the EC have almost ceased.

The primary focus of the method developed for this study concentrates on the demand for U.S. poultry by the historically major importers in the EC. The historically minor importers are grouped together. The five major importers are West Germany, Greece, Italy, Netherlands and the United Kingdom. On the average, these countries have accounted for over 54 percent of total value of US poultry exports to the EC since 1985. The minor importers are Belgium/Luxembourg, Denmark, France, Ireland, Portugal and Spain. They are aggregated under the heading Rest-of-EC.

This study recognizes the difficulty involved with capturing the overall effects of the 1992 harmonization initiatives. To determine the full effects of the proposed 1992 harmonization on poultry, one must go beyond measuring the current level of agricultural protection, and include analysis of the shifts in production, and changes in supply and demand. These analyses are not addressed here due to insufficient data. Instead, a partial model is used which more closely represent the period after the harmonization situation has settled. Price elasticities of demand for U.S. poultry exports to the EC-12 are determined and the results used to anticipate the impact of harmonizing EC

prices on U.S. poultry exports.

MODEL SPECIFICATION

DEMAND:

To avoid simultaneous equation bias, and also obtain consistent parameter estimates, this study used a seemingly-unrelated-regression (SUR) procedure to estimate the export demand for U.S. poultry by the five major EC importers and the Rest-of-EC. Ordinary least squares (OLS) regression is used to estimate the U.S. poultry export supply to the EC. As noted in chapter III, poultry prices in the EC are higher than the U.S. FOB prices. However, U.S. poultry was assumed to be a close substitute to the EC and other poultry. This substitution assumption means that if trade barriers were liberalized, EC consumers would demand U.S. poultry or any other poultry based on price rather than place of origin. This assumption follows the Alston and Scobie result.

The per capita import of U.S. poultry (hereafter called Import Demand) in country i is assumed to be a function of foodshare of total personal expenditure, U.S. free-on-board (FOB) price of poultry to that country, the domestic price of poultry in that country, and the lagged quantity of U.S. poultry imported by that country.

The import demand by EC country "i" can be specified in log linear form as:

$$Qe_i = \beta_0 + \beta_1 Fd_i + \beta_2 Pe_i + \beta_3 Pd_i + \beta_4 lQe_i + U_1 \qquad (1)$$

where, in country i:

Qe = Per capita imports of U.S. poultry by country i

Fd = Food share of total personal expenditure

Pe = U.S. FOB price of poultry to country i at the port of entry

Pd = Domestic producer price of poultry in country i

lQe = Lagged per capita imports of U.S. poultry by country i

U_1 = The error term.

The log linear specification gives parameter estimates that are elasticities. The import demand model hypothesized that the income effect as represented by Fd would be negative. That is, as Fd goes up, the quantity of U.S. poultry consumed goes down. Fd was chosen over the income variable to avoid inherent collinearity problems between income and price variables. Furthermore, the harmonization program is expected to drive prices down and increase income. While this may increase consumption, it will lower the foodshare of personal expenditure.

The effect of own-price (Pe) on per capita imports of U.S. poultry is hypothesized to be negative. The EC domestic poultry price (Pd) is included to capture the

cross-price relationships for the U.S. poultry. High market protection programs lead to high domestic EC prices. An increase in Pd, all else being equal, will increase per capita imports of U.S. poultry. The lagged quantity variable (lQe) serves to capture the effects of changes in tastes and preferences for U.S. poultry.

SUPPLY:

The supply of U.S. poultry to the European Community was estimated as a price dependent equation using the aggregate import demand quantities and average FOB prices over EC countries in order to avoid estimating complex multi-country supply models. The aggregate FOB price to the EC is defined as a function of aggregate import demand quantities by the EC (Qx), U.S. export capacity, for which the beginning stock of poultry (Qt), and the domestic U.S. prices (Pu) served as proxies, and a lagged aggregate FOB prices variable. The model was specified in log linear form as :

$$Px = \gamma_0 + \gamma_1 Qx + \gamma_2 Qt + \gamma_3 Pu + \gamma_4 lPx + U_2 \qquad (2)$$

where:

Px = aggregate U.S. FOB export price of poultry to the EC

Qx = aggregate export quantity of U.S. poultry to the EC

Qt = U.S. annual beginning stock of poultry

Pu = domestic price of poultry in the U.S.

lPx = lagged aggregate FOB export price of poultry to the EC

U_2 = the error term

The underlying hypothesis of the supply equation is that as the aggregate U.S. poultry exports (Qx) to the EC increase, the aggregate U.S. export price (Px) is expected to increase. The aggregate U.S. export price to the EC is expected to fall as the domestic stock of poultry increases. U.S. domestic poultry price and the export price are positively related. The lagged export price variable serves to capture changes in the propensity to consume U.S. poultry.

The supply and demand models are linked together by a set of identities:

$$\sum_{i=1}^{6} Qe_i = Qx \qquad (3)$$

$$\left(\sum_{i=1}^{6} Qe_i Pe_i\right)/Qe_i = Px \qquad (4)$$

The error terms in all equations were assumed to be normally distributed with constant variances, and zero expected values. The error terms were also assumed to be contemporaneously uncorrelated with each other to the extent

that the EC policies will interfere with the results. The complete model, comprising six demand relations, one functional export supply relation, and two equilibrium identities, is written as:

$$\text{DEMAND:} \quad Qe_i = \beta_0 + \beta_1 Fd_i + \beta_2 Pe_i + \beta_3 Pd_i + \beta_4 lQe_i \qquad (5)$$

$$i = 1,.....6$$

$$\text{SUPPLY:} \quad Px = \gamma_0 + \gamma_1 Qx + \gamma_2 Qt + \gamma_3 Pu + \gamma_4 lPx \qquad (6)$$

$$\text{EQUILIBRIUM IDENTITIES:} \quad \sum_{i=1}^{6} Qe_i = Qx \qquad (7)$$

$$\left(\sum_{i=1}^{6} Qe_i Pe_i\right)/Qe_i = Px \qquad (8)$$

From the assumptions, the signs of the parameter estimates are expected as follows:

$$\text{DEMAND:} \quad \beta_1 < 0,\ \beta_2 < 0,\ \beta_3 > 0,\ \beta_4 > 0$$

$$\text{SUPPLY:} \quad \gamma_1 > 0,\ \gamma_2 < 0,\ \gamma_3 > 0,\ \gamma_4 > 0$$

DATA AND VARIABLES:

Annual data from 1965 to 1987 for the U.S. poultry exports to the EC countries were obtained from various issues of the Commodity Trade Statistics (United Nations). This publication also provided data for intra-EC poultry

trade. The Agricultural Statistics of the European Community of the USDA provided the domestic producer prices data for the EC countries. Annual currency exchange rates, wholesale price indexes, and population figures for the EC countries were obtained from the International Financial Statistics (International Monetary Fund). The personal food consumption and total personal expenditures in each EC nation were also obtained from the International Financial Statistics. United States FOB export price and production data were obtained from various issues of USDA Poultry Situation and Outlook Reports and the Foreign Agricultural Trade of the United States publications.

The U.S. FOB export prices and the EC producer prices expressed in each country's currency per metric tons were converted to dollars per 100 kilograms. The U.S. FOB export price (Pe) to the major importing countries, and the domestic producer price (Pd) in each country were computed as:

$$Pe_i = XPCP_i/WPR_i$$

$$Pd_i = PTP_i/WPR_i$$

where:

$XPCP_i$ = unit export price to country i (U.S. dollars per 100 kilograms)

WPR_i = Wholesale price index of the ith country, (1980 = 100)

PTP_i = domestic producer price of poultry in the ith

country.

Foodshare of total personal expenditure was computed as:

$$Fd_i = FOD_i/PFC_i$$

where:

Fd_i = Food share of total personal expenditure

FOD_i = Annual personal food expenditure

PFC_i = Annual total personal consumption expenditure

CHAPTER VII

RESULTS

Before presenting the results of this study, some econometric issues associated with the model have to be clarified. Consistent data on U.S. poultry exports to the EC-12 were not available until 1965. Hence, the period from 1965 to 1987 was covered by this study. The Durbin-Watson test could not be used to test for first-order serial correlation due to the presence of a lagged dependent variable in the equations. Pindyck and Rubinfeld have suggested the use of the Durbin h-statistic test instead. The test is specified as:

$$h = (1 - \frac{DW}{2}) \left(\frac{T}{1 - T[Var(\beta)]} \right)^{.5}$$

where DW is the Durbin-Watson statistic, T is the number of observations, and Var(β) is the variance of the coefficient of the lagged dependent variable. The value h is normally distributed with a mean of zero and variance of 1. The normal distribution table was used to test for first-order serial correlation. The hypothesis tested was:

Ho: no serial correlation

Ha: serial correlation

For significance level of 0.05, and critical values of 0.1736, 0.2206, 0.1075, 0.0655, 0.3821, and 0.4052 (one-tailed-test), there was not sufficient evidence to reject the null of no serial first order autocorrelation for all the equations.

The SAS collinearity diagnostics for the parameter estimates (Appendix) indicated collinearity among the U.S export prices (Pe) and the domestic prices of poultry (Pd) for German, Italian and the Netherlands demand equations. These countries are among the original EC members and have protected their markets from poultry imports. The minimum prices at which non-EC poultry may reach an EC port of entry are set quarterly by the EC Commission in order to protect the EC poultry market. The import prices facing consumers in these countries have been distorted by the addition of various import levies to the minimum import prices. For this reason, non-EC poultry prices reaching these countries may closely follow the EC prices.

The diagnostics also showed collinearity among foodshare and the domestic prices variables for the U.K. and the Rest-Of-EC demand equations. The diagnostics failed to show collinearity in the Greek demand equation. Greece was admitted into the EC in 1981, and just began transition phase of implementing CAP policies in its domestic agricultural market when this study ended.

The supply equation showed collinearity among the U.S.

domestic price (Pu) and the lagged export price (lPx). The difficulty in estimating stable and precise parameters in the presence of multicollinearity is recognized. However, the variables were retained in the model, because elimination of one or the other, did not changed the results.

Since harmonization of various prices is the main concern of the 1992 initiative, parameter estimates from this study will only be used as an indicator of the possible direction of poultry trade between the U.S. and the EC after the harmonization initiatives. With these caveats, the results of the estimated export demand functions for the major EC importers are presented in Table 5.

Statistical significance at the 0.10 level and a critical value of 1.341 (one-tailed-test) was chosen for discussion reference for this study. The F-Statistic was significant for each equation in the model. The significance of the F-statistic indicates that the coefficients of the independent variables in each equation taken together are not zero.

The goodness-of-fit (R^2) for the German equation indicates that the variables explained 78 percent of the variation in quantity of U.S. poultry demanded. The estimated parameters on Pe, Pd and lQe have the expected signs, and were statistically significant except for lQe.

TABLE 5 ESTIMATED IMPORT DEMAND FUNCTIONS FOR U.S. POULTRY BY THE EC

	Constant	Foodshare (Fd)	U.S. Price (Pe)	Domestic Price (Pd)	Lagged Qty. (lQe)	R^2	Durbin-h Statistic
GERMANY	4.519	3.639*	-0.795*	2.256*	0.181	0.78	0.94
	(2.26)**	(0.94)	(0.34)	(0.56)	(0.17)		
GREECE	6.641	1.718	-1.621*	1.597*	0.299*	0.76	0.77
	(4.65)	(3.62)	(0.48)	(0.47)	(0.17)		
ITALY	-0.928	1.367*	-0.836	2.251*	-0.032	0.90	1.24
	(1.55)	(0.64)	(0.85)	(0.96)	(0.17)		
NETHER-LANDS	1.677	1.328*	-1.260	2.761	0.153	0.38	1.51
	(8.94)	(0.46)	(1.95)	(3.06)	(0.20)		
U.K.	-8.388	-2.073*	-0.645*	2.166*	0.672*	0.71	0.30
	(4.54)	(1.25)	(0.33)	(0.71)	(0.15)		
REST-OF-EC	-6.973	-2.876*	-1.343*	2.054*	0.595*	0.91	0.24
	(2.61)	(0.86)	(0.22)	(0.43)	(0.09)		

*Significant at .10 level

**Values in parenthesis are standard errors.

This suggests past per capita imports may have no impacts on current German imports of U.S. poultry. The foodshare variable was significant, but has a positive sign.

The Greek equation has R_2 of 0.76. All the variables had the expected signs and were all statistically significant except for Foodshare (Fd). This implies that per capita imports of U.S. poultry may not be significantly affected by foodshare of personal consumption expenditure in Greece.

The R^2 for the Italian equation was 0.90. The coefficients on Fd and Pd have positive signs and are statistically significant. The coefficients on Pe and lQe have negative signs, but are not statistically significant, suggesting imports of U.S. poultry are not critically determined by either the U.S. export price or the previous imports.

The measure of goodness-of-fit for the Netherlands equation was 0.38, with all variables having the expected signs except Fd. However, only Fd was statistically significant. This indicates that the variables may not be adequate to explain variations in the U.S. poultry exports to the Netherlands. Although the Netherlands import poultry meat from the U.S., they are also one of the leading poultry meat exporters in the world. Most of their exports are destined for other EC members (Bishop, Christensen, Mercier and Witucki). Thus, their imports of U.S. poultry may be

other factors not included in this equation.

The equations for the U.K. and the Rest-of-EC have measure of goodness-of-fit of 0.71 and 0.91 respectively. All the variables in each equation have the expected signs. Both equations have all variables being statistically significant.

Specific elasticities of individual EC nations' demand for the U.S. poultry could not be found in the literature for comparison. In the absence of such information, the estimated EC demand elasticity for the U.S. poultry will be used as a weighted average elasticity in all EC nations.

The study by Tvedt et al. reported own-price elasticity of -0.151 for the EC demand for U.S. poultry. The Economic Research Service (ERS) of the United States Department of Agriculture uses own-price elasticity of demand of -0.90 for the EC. These two elasticities will constitute own-price elasticity range for comparison.

The major EC importers of U.S. poultry in this study are Germany, Greece, Italy, Netherlands and the U.K. As shown in Table 5, the own-price elasticity estimates for these nations are -0.795, -1.621, -0.836, -1.260 and -0.645 respectively. The own-price elasticity estimates for Germany and the U.K. fall within the elasticity range and are both significant. The own-price elasticity for Greece is higher in absolute terms than the elasticity range however, it is significant. Expansions in poultry

production in Greece since being admitted in the EC may explain its high elasticity. The own-price elasticity for Italy falls within the elasticity range, but is not statistically significant. The own-price elasticity estimates for the Netherlands was higher in absolute terms, but was not significant.

Minor importers of U.S. poultry within the EC are represented by Rest-of-EC. Their own-price elasticity estimates is -1.343, which is higher in absolute terms than the elasticity range, and it is significant. The high elasticity for the Rest-of-EC may be explained by France and Spain's position as leading poultry producers and exporters.

The cross-price elasticity, Pd, is significant in all the equations except for the Netherlands. The elasticity estimates are high and suggest quantities of U.S. poultry demanded by these countries are influenced more by the domestic prices than the U.S. FOB prices.

The impact of the lagged exports (lQe) variable is significant only for Greece, the U.K. and the Rest-of-EC. The implication is that the quantity imports for U.S. poultry in these nations are not influenced by past imports, or any sort of institutional habit formation.

Table 6 presents the results of the U.S. poultry export supply function. The F-Statistic was significant, suggesting that the coefficient of at least one of the explanatory variables is not equal to zero.

TABLE 6 ESTIMATED SUPPLY FUNCTION FOR U.S. POULTRY EXPORTS TO THE EUROPEAN COMMUNITY

Constant	U.S. Exports (Qx)	U.S. Stock (Qt)	U.S. Price (Pu)	Lagged Price (lPx)	R2	Durbin-h Statistic
-1.403 (2.06)**	-0.159* (0.11)	0.124 (0.20)	0.601 (0.46)	0.817* (0.19)	0.84	0.02

*Significant at 0.10 level

**Values in parenthesis are standard errors.

The measure of goodness-of-fit (R^2) indicates 84 percent of the variations in U.S. poultry export price to the EC are explained by the variables in the model. The coefficient on U.S. export quantity (Qx) has the wrong sign but is statistically significant. The negative sign of the Qx variable may be because the price at which non-EC poultry enters any EC port of entry is set by the EC Commission in advance.

The parameter estimates on the U.S. beginning stock variable also has the wrong sign and is not statistically significant. Since the early 1970s, the U.S. has consumed about 95 percent of its annual production of broiler meat and exported about 5 percent. There has not been accumulation of stocks to affect export price, hence the possible explanation for the positive sign on the stock variable. Also, a stock variable for poultry in an annual

model may not be especially informative given the short productive cycles for poultry.

The U.S. domestic price variable shows the expected sign, but is not statistically significant. This suggests that U.S. domestic price has little impact on the export price.

The lagged U.S. export price variable (lPx), showed the expected sign and is statistically significant, suggesting that lagged U.S. export prices have significant effect on the export price. This may also be due in part to the consistently high EC market prices, which given the EC's protectionist policies may have institutionalized U.S. export prices.

CHAPTER VIII

SUMMARY AND CONCLUSION

The 1992 economic integration calls for actions to improve the functioning of the EC 's internal market. One such action is the harmonization of agricultural prices. The extent to which the 1992 Harmonization will affect U.S. poultry exports to Europe is based on three factors: 1) European political pressure to prohibit imports of U.S. poultry as the European producers adjust to a "borderless" Europe; 2) the magnitude of poultry price declines in the EC; and 3) the effect that harmonization will have on consumer incomes, especially as it relates to the foodshare of their total personal expenditures.

The results of this study cannot be used to analyze the effects of political actions. Nonetheless, it is apparent that these pressures have currently brought a halt to U.S. poultry exports to the EC, under the guise of a phyto-sanitary regulations.

However, the results of this study can be used to examine the effects of the 1992 Harmonization on U.S. poultry exports to the EC through the changes EC domestic poultry prices and income related factors. In general, if 1992 Harmonization is successful in revitalizing European economies, then the prospects for U.S. poultry exports will be affected by increased European incomes, and lowered EC

domestic poultry prices, due to more efficient use of agricultural resources. Of course, lowered EC domestic prices will not necessarily lead to lowered European trade barriers. As a result, price competition in EC markets between U.S. and EC producers would remain problematic.

The following summary focusses on the import demand system results for U.S. poultry, which were estimated using seemingly-unrelated-regression procedure. The supply function for U.S. poultry exports to the European Community, which was estimated using OLS regression techniques will also be incorporated to indicate how changes in exports to the EC will affect U.S. export prices.

The demand system results indicate that imports of poultry by Germany are influenced by foodshare of personal consumption expenditure, U.S. export price and the domestic price of poultry in Germany. Thus, if the 1992 harmonization is successful, then U.S. poultry exports are expected to be reduced. Given that foodshare of personal expenditures is expected to decrease as income in the EC increases and EC domestic poultry prices will decline as a result of reduced input costs, the positive coefficient for the foodshare variable and the domestic price elasticities of 2.256 indicates that consumption of U.S. poultry will decrease. The inelastic U.S. own-price elasticity of -0.795 implies that lowered U.S. prices will not dramatically improve export opportunities in the EC.

U.S. exports of poultry to Greece are influenced by U.S. export price, the domestic poultry price in Greece and the lagged per capita imports of U.S. poultry. The elastic U.S. own-price elasticity of -1.621 indicates that exports to Greece are sensitive to price changes. However, the Greek domestic cross-price elasticity of 1.597 suggests domestic poultry production is viewed as a close substitute for U.S. poultry. Thus, if increased poultry production or EC shipments to Greece results in lowered prices, then the U.S. producers will be faced with increased competition in the Greek market.

Foodshare of the personal consumption expenditure and the domestic price of poultry are the major forces affecting U.S. exports of poultry to Italy. As in Germany, the coefficients for these variables indicate that U.S. exports to Italy will be reduced as a result of 1992 harmonization. The Italian cross-price elasticity at 2.25 indicates that Italian poultry is a close substitute for U.S. poultry. Thus, if Italian poultry prices decline as a result of the harmonization process, U.S. poultry exports to Italy will decline.

The only significant variable influencing per capita poultry imports of the Netherlands was foodshare. However, as noted in Chapter VII, multicollinearity concerns negate any confidence the coefficient estimate. Thus, the multicollinearity concern along with the equation R_2 of 0.38

suggests variations in the imports of U.S. poultry by the Netherlands are not adequately explained by model developed. Nonetheless, this lack of explanation may indicate that economic factors such as prices and income do not play major roles in determining U.S. poultry exports to the Netherlands.

The demand equation results indicate that imports of U.S. poultry by U.K. and the Rest-of-EC are influenced by foodshare, U.S. export price, the domestic prices and the lagged per capita imports of U.S. poultry. The foodshare elasticities of -2.073 and -2.876 imply that U.S. poultry exports may increase to these nations, if the 1992 Harmonization is successful.

The U.S. own-price elasticities for poultry are inelastic in the U.K. and elastic in the Rest-of-EC. The inelastic own-price elasticity of -0.645 implies that lowered U.S. export price will not induce significant increase in U.S. poultry exports to the U.K. market. However, the elastic own price elasticity of -1.343 indicates that U.S. poultry exports to the Rest-of-EC are responsive to price changes.

Domestic cross-price elasticity for the U.K. and the Rest-of-EC is 2.166 and 2.054 respectively. These elasticities are indications that domestic poultry production in the U.K. and the Rest-of-EC are accepted as close substitutes for U.S. poultry. Therefore, increased

poultry production in these countries will result in less imports of U.S. poultry.

United States poultry exports to the EC have not been stable during the past two decades. As indicated by figure 4, less than 4 percent of total value of U.S. poultry exports currently goes to the EC. Domestic EC policies while promoting domestic production, have also increased poultry prices in the EC and reduced imports.

The results of the supply function of U.S. poultry exports to the EC shows that the U.S. export price is influenced by the quantity exported and the lagged price variables. The price flexibility of -0.159 implies that U.S. exporters are very responsive to price changes. Because the import prices set by the EC Commission are invariably lower than the world market prices, non-EC poultry exporters have remained sensitive to the export price. Consequently, if the harmonization program further lowers the import price below the world market price, non-EC exporters may seek alternative markets for their poultry.

The U.S. beginning stocks and U.S. domestic poultry prices show no significant influence on the U.S. export prices to the EC. The true effects of these variables on the export price may not be captured for the reason that only a small amount of the total U.S. poultry exports goes to the EC.

It is certain that the 1992 harmonization program will

involve many changes in the domestic EC market. However, because the dynamics of the changes are more often politically instigated, not all of these changes can be captured in the model used in this study. This study has shown the strong influence that domestic EC prices have on demand for U.S. poultry.

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APPENDIX

Collinearity Diagnostics for the German Demand Equation

Variable	Condition Number	Variance Proportion Intercept	Fd	Pe	Pd	lQe
Intercept	1.00000	0.0000	0.0001	0.0001	0.0000	0.0001
Fd	20.40778	0.0006	0.1349	0.0140	0.0001	0.0575
Pe	44.18761	0.0110	0.0112	0.2896	0.0161	0.4197
Pd	90.73068	0.9652	0.3952	0.0010	0.0904	0.3638
lQe	101.29789	0.0232	0.4586	0.6953	0.8935	0.1589

Collinearity Diagnostics for the Greek Demand Equation

Variable	Condition Number	Variance Proportion Intercept	Fd	Pe	Pd	lQe
Intercept	1.00000	0.0000	0.0000	0.0001	0.0001	0.0006
Fd	12.32184	0.0040	0.0130	0.0028	0.0219	0.0599
Pe	14.14462	0.0001	0.0000	0.0197	0.0146	0.4178
Po	63.18024	0.0137	0.0070	0.9741	0.9143	0.2767
lQe	107.26061	0.9822	0.9799	0.0033	0.0491	0.2450

Collinearity Diagnostics for the Italian Demand Equation

Variable	Condition Number	Variance Proportion Intercept	Fd	Pe	Pd	lQe
Intercept	1.00000	0.0002	0.0007	0.0000	0.0000	0.0008
Fd	5.92343	0.0004	0.0745	0.0000	0.0001	0.0617
Pe	21.74040	0.0862	0.4507	0.0047	0.0064	0.7327
Pd	35.70318	0.7937	0.0299	0.0354	0.0178	0.1292
lQe	132.66880	0.1195	0.4442	0.9599	0.9757	0.0756

Collinearity Diagnostics for the Netherlands Demand Equation

Variable	Condition Number	Variance Proportion Intercept	Fd	Pe	Pd	lQe
Intercept	1.00000	0.0001	0.0047	0.0001	0.0000	0.0029
Fd	5.96194	0.0003	0.6646	0.0001	0.0001	0.1119
Pe	9.00007	0.0022	0.1457	0.0030	0.0011	0.7154
Po	59.02408	0.5999	0.0220	0.3950	0.0013	0.1688
lQe	105.23599	0.3975	0.1629	0.6018	0.9975	0.0010

Collinearity Diagnostics for the United Kingdom Demand Equation

Variable	Condition Number	Variance Proportion Intercept	Fd	Pe	Pd	lQe
Intercept	1.00000	0.0000	0.0001	0.0002	0.0001	0.0010
Fd	15.01681	0.0022	0.0642	0.0057	0.0009	0.4639
Pe	16.57453	0.0002	0.0263	0.0590	0.0138	0.5234
Pd	46.46577	0.0401	0.0634	0.8725	0.1883	0.0005
lQe	105.24532	0.9575	0.8459	0.0625	0.7969	0.0113

Collinearity Diagnostics for the Rest-of-the-EC Demand Equation

Variable	Condition Number	Variance Proportion Intercept	Fd	Pe	Pd	lQe
Intercept	1.00000	0.0001	0.0003	0.0008	0.0001	0.0023
Fd	7.80996	0.0002	0.0030	0.0748	0.0026	0.4162
Pe	14.35624	0.0053	0.1242	0.2317	0.0005	0.5488
Pd	27.89275	0.0176	0.3093	0.6882	0.1990	0.0318
lQe	69.01909	0.9767	0.5632	0.0045	0.7978	0.0010

Collinearity Diagnostics for the Export Supply Equation

Variable	Condition Number	Variance Proportion				
		Intercept	Qx	Qt	Pu	lPx
Intercept	1.00000	0.0000	0.0001	0.0000	0.0000	0.0001
Qx	32.81352	0.0212	0.0037	0.0086	0.0003	0.4020
Qt	55.44193	0.0001	0.5717	0.048	0.0492	0.0017
Pu	110.48306	0.4121	0.0850	0.853	0.0924	0.0212
lPx	134.51932	0.5666	0.3395	0.089	0.8581	0.5750

VITA

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