An Analysis of Major Poultry Products Traders in World Markets

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This study evaluates the competitiveness of the United States and other major exporters of poultry products in world markets. The analytical technique used to measure the competitiveness of the major traders was the shift-share analysis model. One of the results from this study reveals that chicken meat exports from the U.S. relative to the countries in the world increased by 1,613,861 metric tons in time period 1985–95.

As more countries enter the international poultry market, growing competition is becoming a major concern for existing suppliers. However, there is an increasing broiler meat consumption in areas of the world where it has historically been low. Such areas include China, Thailand, Indonesia and Vietnam (Thornton, 1996). Other factors include the effect of the importing nation's increase in purchasing power and the consequent change in preferences or, changes in preferences of different poultry product categories regardless of an increase in income.

Exporters tend to offer in domestic markets products that reflect national preferences. They are then challenged to find a destination where excess product in the form of "rejected" product categories would be acceptable in order to complete the transaction. This type of commercial operation tends to be "transaction oriented." A common practice is to sell surplus U.S. leg products in the Japanese market to fulfill the increased demand for breast meat in the U.S. market to a profitable level (Thornton, 1996).

The U.S. broiler industry currently accounts for 37 percent of the international trade of broiler meat. Aho (1996) attributes this position to low feed cost in the U.S. However, a report recently issued by the International Finance Corporation shows that other nations are improving efficiency, which may impact the present competitive position of the U.S. poultry industry (Henry & Rothwell, 1995).

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Objective of the Study

The objective of the study is to evaluate changes in the share of U.S. and other major competitors in selected poultry product markets between 1985 and 1995 for the following poultry product categories:

1. *Chicken meat*: includes all product forms (leg quarter, thigh, wing, breast, etc.) originating from the broiler production.
2. *Canned chicken meat*: a subset of the chicken meat.
3. *Turkey meat*: includes all product forms originating from the turkey production.
4. *Duck meat*: includes all product forms orignating from the duck production.
5. *Goose meat*: includes all product forms originating from the goose production.
6. *Fresh poultry meat*: includes fresh meat of all poultry species cited above and others such as pigeons and pheasants.

Competitiveness among major poultry traders was evaluated in terms of total change in exports by nation. Each nation was ranked in terms of total change by product category. In this study, poultry meat served as a proxy measure of growth for the whole industry. The study period was subdivided into intervals of five years each (1985-1990 and 1990-1995) to evaluate changes within intervals that otherwise might not be noticed between 1985 and 1995.

Export of poultry products from the U.S. and other countries is crucial to the U.S. economy. Information on the role of the U.S. in the world poultry products market is useful for firms involved in handling, processing, and shipping poultry products to various export markets, as well as for firms seeking additional export mar-

keting opportunities. To provide a basis for such decisions and evaluate the role of the U.S. in various poultry products markets, shift-share analysis was used (Sihite et al., 1991).

Shift-Share Analysis

Shift-share analysis is a descriptive technique for disaggregating an economy into sectors or small components (Hammett and McNamara, 1990). This is done to identify and to better understand the components of the change, i.e. to determine each component's "share of the shift" (Webb, 1989).

Numerous applications of shift-share analysis, which is the technique adopted in this research, have been reported in regional economics. For instance, the technique has been employed to analyze changes in employment structure between various regions of a nation, as well as to analyze changes in regional production and economic growth (Green, 1985). Shift-share analysis has also received limited application in marketing. Green proposes the use of shift-share analysis as an approach for identification of export opportunities.

There are two approaches for the shift-share model: the conventional approach (also referred to as the national growth rate method) and, the Esteban-Marquillas revision of the conventional approach. The conventional approach separates market share changes into three basic components: national share, the industrial mix and the regional shift (Webb, 1989). The national growth share is the expected regional growth given average national growth. The industry mix share measures regional growth due to differences in regional and national industrial structure, usually considered to be influenced by regional forces. Finally, the regional shift component indicates whether or not the region possesses a comparative locational advantage or disadvantage in a particular industry.

There is severe criticism of the conventional approach. Herzog (1977) points out two major problems with the classical shift-share equation. The first problem is the problem of weights. When shift-share component totals are determined for a particular region, the weights represent the industrial structure of the region in the base period. No account is made of structural change between the base and terminal year of the analysis. The second concern is the problem of interwoven effects, where the competitive position and industry-mix effects are interwoven; both depend on industrial structure. The classical formulation of the competitive effect does not measure what it is described to "measure competitive advantage and disadvantage."

Estaban-Marquillas (1972) proposed a new formulation of the shift-share model in order to solve the problem of interwoven effects. This was accomplished by a redefinition of the competitive mix and by creating a fourth shift-share component called the allocation effect. Since then, in spite of the discussions created by this reformulation (Beaudry, 1979), the Esteban-Marquillas model has been commonly used.

One of the major shortcomings of both versions of this model is the failure to provide an explanation of why the analyzed changes happen the way they do (Stevens & Moore, 1980). However, Esteban-Marquillas does provide necessary interaction about the cooperative effect not available in the original shift-share market. Therefore, this research will use the Esteban-Marquillas model to evaluate changes in the export of poultry products in world markets. The shift-share model is a simple technique which relies on easily accessible data, making it fast and inexpensive to work with. The shift-share model is also reasonably accurate in a situation where it is necessary to make fast decisions, quickly and it allows a quick understanding of current trends with rapid results.

Methods and Procedures

The objective of this study was accomplished using the Esteban-Marquillas reformulation shift-share model, with secondary data published by the United Nations Food and Agriculture Organization. The shift-share analysis model and its components are shown by the following:

$$T_{i,nation} = G_{i,nation} + M_{i,nation} + C_{i,nation} + A_{i,nation}$$

$$G_{i,nation} = E_{i,nation}\, R_{world}$$

$$M_{i,nation} = E_{i,nation}\,(R_i, World\text{-}R_{world})$$

$$C_{i,nation} = {}^{0}E_{i,nation}\,(R_{i,nation} - {}^{0}E_{i,nation})\,(R_{i,nation} - R_{i,world})$$

$$A_{i,nation} = (E_{i,nation} - {}^{0}E_{i,nation})\,(R_{i,nation} - R_{i,world})$$

where:

Ti,nation is the total export change of nation x in commodity i.

Gi,nation is the world growth of nation x in commodity i.

Mi,nation is the industrial mix of nation x in commodity i.

Ci,nation is the competitive position of nation x in commodity i.

Ai,nation is the allocation of nation x in commodity i.

The equations shown below, the complementary components of the main shift-share equations, identify values required in the analysis.[1]

Ri,nation = (E*i,nation - Ei,nation) / Ei,nation

Ri,world = (E*i,world - Ei,world) / Ei,world

Rworld = (E*world - Eworld)/ / Eworld

^{0}Ei,nation = E*world - (Eworld) / Eworld

Where:

Ri,world = World growth rate in commodity i

Ri,nation = Nation x's growth rate in commodity i

Rworld = World average growth of poultry meat export

Ei,nation = Total commodity i exported from nation x in the base year ('85 or '90)

^{0}E = The homothetic quantity export, which indicates the export volume that would have existed if the export structure of the nation were equal to the world structure.

Enation = Total poultry meat exports from nation x in the base year (85/90).

i = commodity exports (in this case i will be the different product categories: chicken meat, turkey meat, canned chicken meat,...).

Gi,nation is the growth effect. The growth effect indicates the export growth change that would have occurred in a nation's exports had they grown at the same rate as those of the world. This implies that in the absence of positive or negative effects of the remaining components (industrial mix, competitive effect, and allocation effect), then there will be a change in the growth of exports of commodity i from nation x.

Mi,nation is the industry mix effect. It represents the impact of world specialization in sector i of the industry on the regional exports i.e., if the sector is more or less competitive than the whole industry, the industry mix should be higher or lower.

Ci,nation is the competitive effect and is based on the premise that the nation has the same structure as the world (given by ^{0}Ei,nation). The competitive effect reflects whether or not a nation has a competitive advantage in comparison to the world. Therefore, this component will be positive if the nation enjoys a competitive advantage or it will be negative if it has competitive disadvantage. In cases where both growth rates are equal, the competitive effect will be zero.

Ai,nation is the competitive effect. This component indicates whether the nation is specialized in the sector in which it has competitive advantage or disadvantage. The allocation effect will be positive if the nation is specialized in those sectors of faster world growth, or if the nation is not specialized in the sectors in which it is lacking in competitive advantage. However, this component will be negative if the nation is specialized in sectors in which the nation is lacking in competitive advantage or if the nation is not specializing in the sectors for which it has a competitive advantage. The allocation effect will be larger the more specialized the nation is and the more competitive advantage it has. If the nation is not specialized in a given sector, or if it does not enjoy any competitive advantage, the allocation effect has a value of zero, which means that this sector does not contribute to national growth through the allocation effect. Table 1 illustrates the possible interaction of the allocation and the competitive effects (Webb, 1989).

[1]Superscript (*) denotes volume exported in terminal year (1990 or 1995). The term "terminal year" represents the volume of a commodity exported at the end of each time period.

Table 1. Allocation effect interpretations.

Allocation Effect	Competitive Effect	Interpretation
+	+	Specialized, competitive advantage
-	-	Specialized, competitive disadvantage
+	-	Not specialized, competitive disadvantage
-	+	Not specialized, competitive advantage

Source: Webb, Darrin M., "A Subregional Analysis of Mississippi's Economic Structure," M.S. Thesis, Department of Agricultural Economics, Mississippi State University, December 1989.

Results and Discussions

This section of the paper presents the results of each component in the shift-share analysis. The discussion is intended to provide an overview, highlighting each component of the shift-share analysis, rather than providing a detailed interpretation of each table. Each subsection provides information for comparing major poultry product exporters in the world market.

The World Growth Effect

Comparisons of changes in poultry products by categories from major exporters relative to those of the world are shown in Tables 2-4. These data indicate that France, Brazil, United States, and the Netherlands performed well during the periods 1985-1995, 1985-1990, and 1990-1995. Poultry product exports from France relative to world exports increased 1.5 million metric tons in time period 1985-1995, 374.2 thousand metric tons from 1985-1990, and over 1 million metric tons from 1990-1995. For the United States, the largest increase occurred from 1990-1995, when poultry product exports were about 1.3 million metric tons larger than those exports of poultry products from the world.

The growth rates of Brazil were also greater than the world growth rates in the time periods analyzed. The largest growth rate occurred from 1985-1995 while the smallest growth rate occurred from 1985-1990. For the Netherlands, the largest growth rate occurred from 1985-1990. These results indicate that if the Netherlands had grown like the world economy, 1 million and 252 thousand more metric tons of poultry products would have been exported over the 1985-1995 and 1985-1990 time periods, respectively (Tables 2 and 3). Similar conclusions can be drawn from the growth rates of the other countries found in this section.

The Industrial Mix Effect

The industrial mix effect is shown in Tables 5-7. Results show that the total industrial mix effect for the time periods 1985-1995 and 1990-1995 is negative. These results suggest that exports from those countries were less in those time periods than they would have been if their economic structure were identical to exporters in the world.

In the 1985-1990 time period (Table 6), the total industrial mix effect was positive. These results suggest that during this period, all exporters except Brazil, Hungary, the Netherlands, and former Yugoslavia concentrated in the export sectors that were relatively faster growth areas.

Turkey meat, duck meat, and fresh poultry meat contributed greatly to the positive industrial mix effect from 1985-1990. During that period, turkey meat, duck meat, and fresh poultry meat grew at almost 110.4, 9.5 and 7.6 thousand metric tons, respectively.

In the 1985-1995 time period, Brazil, Hungary and the Netherlands had structural disadvantage of almost 92.3, 50.0, and 6.8 thousand metric tons compared to the world.

This structural disadvantage for those countries in the 1985-1990 decreased to 23.3, 14.0 and 1.6 thousand metric tons, respectively, compared to the exporters of the world. In the 1990-1995 time period, the structural disadvantage also declined but not as much as the 1985-1990 time period.

In time periods 1985-1995 and 1985-1990, exports of poultry products from the United Kingdom (UK) and France grew at a faster rate than the other major exporters and the world average. This result suggests that exporters in France and the United Kingdom concentrated on relatively fast growth export sectors in those time periods, as reflected by the positive industrial mix effect, than the other exporters or the world did.

Table 2. Changes in poultry product exports, by category, from major exporters due to the world growth effect, 1985-1995.

	Poultry Product Categories						
Country	Chicken Meat	Turkey Meat	Duck Meat	Goose Meat	Canned Chicken Meat	Fresh Poultry Meat	Total
	(Metric Tons)						
Brazil	667,707	--	--	--	--	672,127	1,339,834
Brunei	--	--	2,959	--	--	--	2,959
France	670,751	57,835	11,677	212	26,765	740,474	1,507,714
Germany	--	--	--	387	--	--	387
Hungary	380,749	--	--	--	18,127	380,749	779,625
Israel	--	481	--	--	--	--	481
Italy	--	9,225	--	--	--	--	9,225
Netherlands	449,927	17,865	11,961	407	56,437	480,159	1,016,756
UK	--	29,744	8,996	--	--	--	38,740
USA	476,630	29,698	15,911	--	18,929	522,239	1,063,407
Yugoslavia	--	--	--	--	22,398	--	22,398
Total	2,645,764	144,367	51,504	1,487	142,656	2,795,748	5,781,526

Table 3. Changes in poultry product exports, by category, from major exporters due to the world growth effect, 1985-1990.

	Poultry Product Categories						
Country	Chicken Meat	Turkey Meat	Duck Meat	Goose Meat	Canned Chicken Meat	Fresh Poultry Meat	Total
	(Metric Tons)						
Brazil	165,704	--	--	--	--	166,801	332,505
Brunei	--	--	734	--	--	--	734
France	166,459	14,353	2,898	53	6,642	183,762	374,167
Germany	--	--	--	96	--	--	96
Hungary	94,490	--	--	--	4,499	94,490	193,479
Israel	--	--	--	119	--	--	119
Italy	--	2,289	--	--	--	--	2,289
Netherlands	111,658	4,434	2,968	101	14,006	119,160	252,327
UK	--	7,382	2,233	--	--	--	9,615
USA	118,284	7,370	3,949	--	4,698	129,603	263,904
Yugoslavia	--	--	--	66	5,559	--	5,625
Total	656,595	35,828	12,782	435	35,404	693,816	1,434,860

Table 4. Changes in poultry product exports, by category, from major exporters due to the world growth effect, 1990-1995.

	Poultry Product Categories						
Country	Chicken Meat	Turkey Meat	Duck Meat	Goose Meat	Canned Chicken Meat	Fresh Poultry Meat	Total
	(Metric Tons)						
Brazil	330,955	--	--	--	--	343,265	674,220
Brunei	--	--	3,398	--	--	--	3,398
France	385,126	120,936	11,897	84	12,659	518,070	1,048,799
Germany	--	--	--	123	--	--	123
Hungary	218,831	--	--	--	--	218,831	437,662
Israel	--	--	--	1,019	--	--	1,019
Italy	--	18,528	--	--	--	--	18,528
Netherlands	280,872	22,301	8,745	26	40,326	311,944	664,214
UK	--	33,572	4,613	--	--	--	38,185
USA	599,334	32,310	7,265	--	32,916	638,879	1,310,674
Yugoslavia	--	--	--	-	433	--	433
Total	1,815,118	227,674	35,888	1,252	86,334	2,030,989	4,197,255

Table 5. Changes in poultry product exports, by category, from major exporters due to the industrial mix effect, 1985-1995.

	Poultry Product Categories						
Country	Chicken Meat	Turkey Meat	Duck Meat	Goose Meat	Canned Chicken Meat	Fresh Poultry Meat	Total
	(Metric Tons)						
Brazil	-84,670	--	--	--	--	-7,608	-92,278
Brunei	--	--	1,356	--	--	--	1,356
France	-85,056	116,695	5,351	3,106	3,909	-8,382	35,623
Germany	--	--	--	5,682	--	--	5,682
Hungary	-48,282	--	--	--	2,647	-4,310	-49,943
Israel	--	--	--	7,058	--	--	7,058
Italy	--	18,613	--	--	--	--	18,613
Netherlands	-57,054	36,047	5,481	5,964	8,242	-5,435	-6,755
UK	--	60,015	4,123	--	--	--	64,138
USA	-60,440	59,923	7,292	--	2,764	-5,911	3,628
Yugoslavia	--	--	--	3,917	3,271	--	7,188
Total	-335,502	291,293	23,603	25,727	20,833	-31,646	-5,692

Table 6. Changes in poultry product exports, by category, from major exporters due to the industrial mix effect, 1985-1990.

	Poultry Product Categories						
Country	Chicken Meat	Turkey Meat	Duck Meat	Goose Meat	Canned Chicken Meat	Fresh Poultry Meat	Total
	(Metric Tons)						
Brazil	-25,160	--	--	--	--	1,831	-23,329
Brunei	--	--	544	--	--	--	544
France	-25,275	44,245	2,148	117	-983	2,017	22,269
Germany	--	--	--	213	--	--	213
Hungary	-14,347	--	--	--	-665	1,037	-13,975
Israel	--	--	--	265	--	--	265
Italy	--	7,057	--	--	--	--	7,057
Netherlands	-16,954	13,667	2,200	224	-2,072	1,308	-1,627
UK	--	22,755	1,655	--	--	--	24,410
USA	-17,960	22,720	2,927	--	-695	1,423	8,415
Yugoslavia	--	--	--	147	-822	--	-675
Total	-99,696	110,444	9,474	966	-5,237	7,616	23,567

Table 7. Changes in poultry product exports, by category, from major exporters due to the industrial mix effect, 1990-1995.

	Poultry Product Categories						
Country	Chicken Meat	Turkey Meat	Duck Meat	Goose Meat	Canned Chicken Meat	Fresh Poultry Meat	Total
	(Metric Tons)						
Brazil	-21,676	--	--	--	--	-7,789	-29,465
Brunei	--	--	234	--	--	--	234
France	-25,224	28,867	818	822	3,998	-11,755	-2,474
Germany	--	--	--	1,211	--	--	1,211
Hungary	-14,332	--	--	--	1,177	-4,965	-18,120
Israel	--	--	--	9,998	--	--	9,998
Italy	--	4,422	--	--	--	--	4,422
Netherlands	-18,396	5,322	601	256	12,737	-7,078	-6,558
UK	--	8,012	317	--	--	--	8,329
USA	-39,254	7,711	497	--	10,396	-14,497	-35,147
Yugoslavia	--	--	--	--	137	--	137
Total	-118,882	54,334	2,467	12,287	28,445	-46,084	-67,433

Table 8. Changes in poultry products categories from major exporters due to the competitive effect, 1985-1995.

	Poultry Product Categories						
Country	Chicken Meat	Turkey Meat	Duck Meat	Goose Meat	Canned Chicken Meat	Fresh Poultry Meat	Total
	(Metric Tons)						
Brazil	-379,381	--	--	--	--	-468,593	-847,974
Brunei	--	--	-46	--	--	--	-46
France	-390,245	18,483	4,830	-6,417	-3,657	-296,134	-673,140
Germany	--	--	--	-505	--	--	-505
Hungary	-400,250	--	--	--	-28,233	-425,938	-854,421
Israel	--	--	--	-241	--	--	-241
Italy	--	357	--	--	--	--	357
Netherlands	-215,178	-10,746	-10,330	-4,816	-24,162	-251,302	-516,534
UK	--	-6,268	-976	--	--	--	-7,244
USA	1,203,274	16,180	-12,462	--	40,748	1,179,961	2,477,701
Yugoslavia	--	--	--	-889	-7,912	--	-8,801
Total	-181,780	18,006	-18,984	-12,868	26,784	-262,006	-430,848

Table 9. Changes in poultry products categories from major exporters due to the competitive effect, 1985-1990.

	Poultry Product Categories						
Country	Chicken Meat	Turkey Meat	Duck Meat	Goose Meat	Canned Chicken Meat	Fresh Poultry Meat	Total
	(Metric Tons)						
Brazil	-110,640	--	--	--	--	-134,939	-245,579
Brunei	--	--	8	--	--	--	8
France	-81,041	13,774	605	-363	-8,057	-35,383	-110,465
Germany	--	--	--	-30	--	--	-30
Hungary	-42,059	--	--	--	-8,930	-60,114	-111,103
Israel	--	--	--	10	00	00	10
Italy	--	332	00	00	00	00	332
Netherlands	-36,574	-7,730	-1,691	-349	104	-48,349	-94,589
UK	--	-1,476	-477	--	--	--	-1,953
USA	231,804	-10,872	-3,663	--	24,595	211,160	453,024
Yugoslavia	--	--	--	-67	-3,090	--	-3,157
Total	-38,510	-5,972	-5,218	-799	4,622	-67,625	-113,502

Table 10. Changes in poultry products categories from major exporters due to the competitive effect, 1990-1995.

	Poultry Product Categories						
Country	Chicken Meat	Turkey Meat	Duck Meat	Goose Meat	Canned Chicken Meat	Fresh Poultry Meat	Total
	(Metric Tons)						
Brazil	-147,361	--	--	--	--	-185,030	-332,391
Brunei	--	--	-78	--	--	--	-78
France	-252,805	-10,361	3,016	-5,128	22,576	-219,038	-461,740
Germany	--	--	--	-483	--	--	-483
Hungary	-283,992	--	--	--	-15,193	-288,448	-587,633
Israel	--	--	--	-91	--	--	-91
Italy	--	-640	--	--	--	--	-640
Netherlands	-139,253	8,894	-7,585	-3,742	-21,272	152,158	-315,116
UK	--	-4,995	186	--	--	--	-4,809
USA	679,887	104,482	-15,298	--	20,003	753,098	1,542,172
Yugoslavia	--	--	--	--	-1,326	--	-1,326
Total	-143,524	97,380	-19,759	-9,444	4,788	-91,576	-162,135

The Competitive Effect

The competitive effects are shown in Tables 8-10. The data suggest that the overall competitive position of the major exporters of poultry products was negative with respect to the rest of the world in the 1985-1995, 1985-1990, and 1990-1995 time periods. In the time periods analyzed for this study, the United States, Brunei, Italy, and Israel had positive values indicating competitive advantage.

The United States' exports of poultry products grew at a faster rate in time periods 1985-1995 and 1990-1995 than in time period 1985-1990. For example, poultry products grew almost 2.5 million metric tons in time period 1985-1990. In time period 1985-1990, the exports of poultry products from the United States grew 453 thousand metric tons.

The Allocation Effect

The allocation effects are shown in Tables 11-13 for poultry products exports from the major exporters relative to the world exporters. The data suggest that the overall allocation effects are negative for the time intervals used for this study. The largest negative allocation effects occurred in time periods 1985-1995 and 1990-1995. In time period 1985-1995, the allocation effect had a negative value of almost 203.4 thousand metric tons. The negative allocation effect is indicative of a poor distribution of poultry product exports from the major exporters relative to those of the world. A positive allocation effect could have resulted if the major exporters had a better distribution of poultry product exports, or if the exporters had specialized in the competitively advantaged poultry product exports rather than in the competitively disadvantaged poultry products.

The results in Table 11 indicate that France, Italy, and the Netherlands, from 1985-1995, had positive allocation effects suggesting that those countries specialized in competitively advantaged poultry product sectors or did not specialize in competitively disadvantaged sectors during that time period. This result also suggests that during time period 1985-1995, most major exporters placed less emphasis on those poultry products in which they did relatively well. In time period 1985-1990, Brunei, France, Israel, Italy, and the Netherlands specialized in the exports in which they were competitively advantaged.

These results indicate that almost half of the major exporters emphasized the poultry products in which they did well, rather than those in which they did not do well (Table 12).

Table 11. Changes in poultry products categories from major exporters due to the allocation effect, 1985-1995.

	Poultry Product Categories						
Country	Chicken Meat	Turkey Meat	Duck Meat	Goose Meat	Canned Chicken Meat	Fresh Poultry Meat	Total
	(Metric Tons)						
Brazil	-52,175	--	--	--	--	-34,635	-86,810
Brunei	--	--	-2,963	--	--	--	-2,963
France	5,328	13,937	7	3,179	1,112	-6,285	17,278
Germany	--	--	--	-5,615	--	--	-5,615
Hungary	-29,748	--	--	--	2,697	-3,226	-30,277
Israel	--	--	--	-7,248	--	--	-7,248
Italy	--	3,055	--	--	--	--	3,055
Netherlands	16,781	2,632	-4,439	-1,688	-25,252	19,392	7,426
UK	--	-48,340	-6,300	--	--	--	-54,640
USA	-5,603	4,516	-11,691	--	-27,316	26,939	-13,155
Yugoslavia	--	--	--	-3,406	-27,067	--	-30,473
Total	-65,417	-24,200	-25,386	-14,778	-75,826	2,185	-203,422

Table 12. Changes in poultry products categories from major exporters due to the allocation effect, 1985-1990.

	Poultry Product Categories						
Country	Chicken Meat	Turkey Meat	Duck Meat	Goose Meat	Canned Chicken Meat	Fresh Poultry Meat	Total
	(Metric Tons)						
Brazil	-15,216	--	--	--	--	-9,974	-25,190
Brunei	--	--	484	--	--	--	484
France	1,106	10,387	1	180	2,450	-751	13,373
Germany	--	--	--	-332	--	--	-332
Hungary	-3,126	--	--	--	853	-455	-2,728
Israel	--	--	--	305	--	--	305
Italy	--	2,845	--	--	--	--	2,845
Netherlands	2,852	1,893	-727	-122	109	3,731	7,736
UK	--	-11,382	-3,077	--	--	--	-14,459
USA	-1,079	-3,035	-3,437	--	-7,403	4,821	-10,133
Yugoslavia	--	--	--	-257	-10,573	--	-10,830
Total	-15,463	708	-6,756	-226	-14,564	-2,628	-38,929

Table 13. Changes in poultry products categories from major exporters due to the allocation effect, 1990-1995.

	Poultry Product Categories						
Country	Chicken Meat	Turkey Meat	Duck Meat	Goose Meat	Canned Chicken Meat	Fresh Poultry Meat	Total
	(Metric Tons)						
Brazil	-25,125	--	--	--	--	-12,875	-38,000
Brunei	--	--	-4,017	--	--	--	-4,017
France	32,431	-15,277	483	4,316	-11,155	-7,250	3,548
Germany	--	--	--	-851	--	--	-851
Hungary	-52,994	--	--	--	9,773	-13,099	-56,320
Israel	--	--	--	-11,577	--	--	-11,577
Italy	--	-3,584	--	--	--	--	-3,584
Netherlands	10,272	-2,983	-1,839	3,473	-28,673	14,257	-5,493
UK	--	-18,714	392	--	--	--	-18,322
USA	42,845	-50,368	6,841	--	616	-1,260	-1,326
Yugoslavia	--	--	--	--	374	--	374
Total	7,429	-90,926	1,860	-4,639	-29,065	-20,227	-135,568

Summary and Conclusions

Summary

The general objective of this study was to evaluate the role of the United States and other major traders of poultry products. To accomplish the objective of this study, the shift-share analysis technique was used. The shift-share model attempts to investigate a shift in the change in market share of poultry products into four components: the world growth effect, the industrial mix effect, the competitive effect, and the allocation effect. Data used to accomplish the objective of this study were obtained from the Food and Agriculture Organization (FAO) Statistical Database.

In this study, the shift-share analysis model was constructed to evaluate changes in competitiveness of major poultry product categories in the world market. The commodities considered were: chicken meat, turkey meat, duck meat, goose meat, canned chicken meat, and fresh poultry meat. In each of the product categories, the largest five in terms of exports in 1985 were selected. The next step was to evaluate changes given by the shift-share model until 1995, breaking it down in two subperiods (85-90 and 90-95) in order to assess any changes that would not be explicitly noticeable when observing the whole period (85-95).

One of the results from this study shows that chicken meat exports from the U.S. relative to the countries in the world increased by 1,613,861 metric tons in time period 1985-95. The total effect of this change was separated into four components. The world growth effect showed that if the U.S. had grown at the same rate as that of the world, total chicken meat exports from the U.S. would have increased by 476,630 metric tons. The total increase was larger than that value due to the competitive effect. Due to that effect, chicken meat exports from the U.S. increased by 1,203,274 metric tons during the 1985-1995 time period. This result implies that the rate of increase in the U.S. was larger than that of the major exporters in the world.

The industrial mix effect had a negative value of 60,440 metric tons suggesting that the U.S. exported less chicken meat in the 1985-1995 time frame than it would have if its economic structure were identical to that of the major exporters in the world. In addition, the allocation effect is indicative of a poor distribution of chicken meat exports from the U.S.

Conclusions

We observed that the international market of this industry is currently dominated by several countries: the U.S., France, the Netherlands, and Brazil. Among the major countries, it was found that less developed nations had a relevant partici-

pation in the industry. This is due to the fact that most of the necessary inputs are currently available from the international companies with an interest in expanding to international markets. The international companies, in general, do not place restrictions on countries that have potential to grow in the poultry industry. These inputs are supplied to different nations at prices comparable to those offered in developed countries. Despite this, in many cases, less developed nations rely on the crucial advantage produced by lower cost of feed and labor. This seems to be a major concern of the developed nations participating in the poultry industry.

The nations that grew the most in each of the commodity categories had competitive advantages and some specialization during some part of the period analyzed if not in the whole period (1985-1995). The leading exporters were: the U.S. – chicken and fresh poultry meat; France and Germany – turkey, duck and goose meat; and the U.S. and the UK – canned chicken meat.

Finally, the shift-share analysis model provided a very useful tool in evaluating competitiveness. The shift-share analysis can help a particular country determine if it has improved its export market share.

The analysis presented in this paper suggests that several countries including the U.S. have benefited from the expansion of world poultry meat export markets. The results do not provide the basis for predicting the U.S. and other exporters future export growth. However, the results do suggest that if poultry meat exports continue to expand in the world, competitiveness will be intensified.

References

Aho, P. (1996). Poultry Perspective: Brazil's hidden advantage. *Broiler Industry*, August, 16.

Beaudry, R., & Martin, F. (1979). Shift-share analysis revisited: the allocation effect and the stability of regional structure, a comment. *Journal of Regional Science*, 19 (3), 389-391.

Cortes, B. S., & Copeland, D. W. (1991). A shift-share analysis of real gross state product in Kansas. Proceedings of the Mid-south Academy of Economics and Finance Meeting, February 6-9.

Esteban-Marquillas, J. M. (1972). Shift-share analysis revisited. I.A. Reinterpretation of shift-share analysis. *Regional and Urban Economics*, 2(3), 249-261.

Food and Agriculture Organization. Statistical Database Online. Internet. 15 Jan. 1997.

Golz, J. T., & Koo, W. W. (1991). Competitiveness of broiler producers in North America under alternative free trade scenarios. Agricultural Economics Report No. 277, Department of Agricultural Economics, North Dakota State University.

Green, R. T., & Allaway, A. W. (1985). Identification of export opportunities: a shift-share approach. *Journal of Marketing*, 49, 83-88.

Hammett, A. L., & McNamara, K. T. (1990). Shifts in the southern share of United States wood product exports from 1980 to 1988. The Georgia Agricultural Experiment Station, College of Agriculture, The University of Georgia Research Report, 594.

Henry, R., & Rothwell, G. (1995). The World Poultry Industry. International Finance Corporation, Global Agribusiness Series, 44-60.

Herzog, Jr., H. W., & Olsen, R. J. (1977). Shift-share analysis revisited: the allocation effect and the stability of regional structure. *Journal of Regional Science*, 17(3), 441-453.

Herzog Jr., H. W. & Olsen, R. J. (1979). Shift-share analysis revisited: the allocation effect and the stability of regional structure, a reply. *Journal of Regional Science*, 19(3), 393-395.

Kochanowski, P., Bartholomew, W., & Joray, P. (1989). The shift-share methodology: deficiencies and proposed remedies. Paper presented at the meeting of the Mid South Academy of Economics and Finance, Nashville, TN.

Sihite, B. (1990). A shift-share analysis of grain exports from Mississippi ports relative to ports in the Gulf of Mexico. Agricultural Economics Research Report 192. Agricultural Economics Department, Mississippi State University.

Stevens, B. H., & Moore, C. L. (1980). A critical review of the literature on shift-share as a forecasting technique. *Journal of Regional Science*, 20(4), 419-437.

Thornton, L. (1996). U.S. Exports Hit $1.7 Billion. *Broiler Industry*, April 1996, 22-27.

United States Department of Agriculture. (1996). Poultry Meat and Products. Foreign Agricultural Service Online. Internet, 1-10. 14 Jan. 1997.

Vicente, Mauricio. "A Trade Change Analysis of Major Poultry Product Categories in the World Market," MABM Research Report, Department of Agricultural Economics, Mississippi State University, Mississippi State, May 1997. Ward, C. W., & Trent, A. Growth export markets for meat products. Current Farm Economics, Oklahoma Agricultural Experiment Station, 3-14.