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RESEARCH DIRECTED TOWARD FOREIGN MARKET DEVELOPMENT PROGRAMS

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Exports have become a major source of market growth for United States agricultural products. The value of agricultural exports increased from less than \$10 billion before 1973 to a peak of \$43.3 billion in 1981 before falling to \$36.1 billion in 1983.

The increase in agricultural exports before 1982 may be attributed to favorable marketing conditions, for example weak United States currency, during that period and the various foreign market development programs carried out by the United States government and various commodity groups. These programs include the P. L. 480 food aid program, the cooperator program, and the export incentive program of the United States Department of the Agriculture (USDA); the credit programs of the Commodity Credit Corporation (CCC); and other trade related promotional programs and activities such as trade shows, electronic information services for exporters, and assistance provided by agricultural attachés.

The decline in agricultural exports after 1981 may be attributed to the recent developments in the debt positions of some of the countries importing United States agricultural products; the strengthening of the United States dollar as a result of tight monetary policy in the United States; and the competition, in terms of both the cost of product and credit, from other major producing countries in South America, Europe, and other areas.

The purpose of this report is twofold. First, it is to review the published results from previous research on foreign market development programs, and, second, it is to discuss the problems in measuring the economic impact of foreign market development programs and the possible directions for future studies.

A few comments about the research on the impact of market development programs on United States agricultural exports need to be made prior to the review of previous research results. First, there is no one research method for properly measuring the impact of market development programs. The methodology chosen depends on (1) the specific questions asked, (2) the nature of the data available and, to

some extent, (3) the amount of money and time one is willing to spend on measuring the effectiveness of these programs.

One can ask a variety of questions related to the effectiveness of foreign market development programs. The following list gives some examples:

- (1) How effective are market development programs?
- (2) How much money should be spent on developing markets?
- (3) What are the net returns from market development program expenditures?
- (4) What are the most effective market development methods to use?
- (5) How should the total market development budget be allocated among commodities and geographic regions?

The published research studies reviewed in the following sections address (1) through (3) above, and can be grouped into two categories: those related to the USDA, Foreign Agricultural Service's (FAS) foreign market development programs, especially the cooperator programs; and those related to the Florida Department of Citrus (FDOC) generic advertising program in Canada. All these studies are commodity oriented, and promotional expenditures were considered as independent variables to reflect changes in tastes and preferences that may have occurred because of the promotional activities. In addition, no effort was made in these studies to estimate the impact of other market development programs, e.g. credit programs, on the exports of United States agricultural products.

Cooperator Programs

The FAS has had the lead governmental role in developing markets overseas for United States farm products. An important part of the FAS export expansion effort is overseas promotion work carried out jointly with market development cooperators from private industry — farm-oriented nonprofit groups, each representing its own commodity interest in foreign markets. There are more than fifty of these groups working with the FAS on a continuing basis. It is estimated that cooperator programs represent the interests of more than 3.5 million farmers, 1,500 United States cooperatives, and more than 7,000 processors and handlers.

The role of cooperators was created by the Agricultural Trade Development and Assistance Act of July 1954 (P. L. 480). Congress and other policymakers at that time recognized the United States had an agricultural bounty that should be used, not only for the benefit of United States consumers, but also for the growing populations of other countries. The potential for commercial agricultural sales was there. Thus, soon after the passage of P. L. 480, the USDA initiated its market development program, making the crucial decision to work with nonprofit, broadly-based agricultural trade associations representing

United States farmers wherever practicable. The National Cotton Council was the first agricultural market development cooperator, signing an agreement with the FAS for research and development of global cotton markets in May, 1955. The newest cooperator group is the Livestock Exporters Association, which joined the ranks in 1984.

Cooperator activities in less developed markets such as the oil-rich OPEC nations are weighted toward the early phases of market development — presentations of United States products to foreign government and trade, marketing research, product testing, product demonstrations, and educational activities. The marketing efforts conducted in established markets such as Western Europe and Japan include such technical trade services as helping overseas buyers choose the right United States product and use that product efficiently; joint promotion efforts with host country businessmen; and trade and consumer press contacts and advertising.

Financing of cooperator-generated market development projects is shared by the FAS, the agricultural cooperator, and, depending on the type of activity, by the foreign organizations involved in the import and use of the particular commodity. The major share of this funding comes from the private sector. On an overall basis, the cooperators and the foreign cooperator groups match FAS contributions two to one. For example, the contributions made by the FAS, United States cooperators, and foreign cooperators in fiscal year 1983 were \$22 million, \$25.8 million, and \$31.3 million, respectively.

FDOC Cooperator Program in Europe

The FDOC cooperator program in Europe was started as a test program in December, 1966, to determine whether this kind of program would promote the sales of Florida citrus products. In 1967 the program was initiated on a full scale. This program is a market development program in that it directly supports the brand promotion activities of distributors in European markets. The cost of this program is financed by the FDOC, the FAS, and European distributors. European distributors have provided the largest share of market development funds since 1971. Promotional activities under this program include market analysis research and surveys; public information education; advertising through newspapers, magazines, radio, television, etc.; and market and sales promotion. All the advertising and promotional activities carried out under this program must contain prominent "Florida" mention.

The first study of the economic impact of the cooperator program on the exports of United States citrus products was completed in 1969. Monthly observations from September, 1961, through August, 1968, and yearly observations from 1952 through 1967 were used by Priscott in his study of demand relationships for seven citrus products in eleven European countries and Canada [9]. Demand relationships at the ex-

port level (quantity exported to the country of interest was considered a function of export price, per capita income of the country, and domestic cooperator expenditures in the country) were fitted using the least squares regression method. The results show that the impact of domestic cooperator expenditures (in this case, the expenditures made by the FDOC) was a statistically significant determinant of the annual demand for frozen concentrated orange juice (FCOJ) in the United Kingdom and the Netherlands. In addition, the impact of domestic cooperator expenditures was significant in the monthly demand relationships for single strength orange juice in Sweden, Belgium, West Germany, and Switzerland. Lagged impacts of cooperator expenditures on the demand for orange juice were not estimated.

The impact of cooperator program expenditures on the exports of United States orange juice to Europe was reestimated in 1977 [4], 1978 [5], and 1983 [6]. In these three studies, annual observations by country and time-series and cross-section pooling techniques were used to measure the economic impact of cooperator activities on the exports of orange juice.

In the 1977 study, total exports of United States FCOJ to the country of interest was considered a function of the United States FCOJ export price and total cooperator program expenditures. A dummy variable technique [3, pp. 339-41] was used to estimate the variations over time and across countries. The study period was from fiscal year 1972-73 through fiscal year 1975-76 with observations on a fiscal year basis. The estimated export returns (the increase in FCOJ export revenue) for all program contributors averaged about \$1.33 per dollar invested. Florida processor returns (the increase in Florida FCOJ revenue) averaged about \$4.29 per dollar invested. The study found that it was more profitable to have spent the money on the cooperator program than it would have been to divert it to advertising in the domestic market. Also, the results suggest that the cooperator program is an economically preferred way of generating additional exports rather than price reductions to achieve additional sales.

The 1977 study was updated in 1979 and modifications were made in the analytical model to make the analysis more meaningful. In the 1979 study, United States orange juice exports to each European country were explained on a per capita basis to account for the effect of the population growth; the Brazilian FCOJ export price was added to the model as an explanatory variable to evaluate the competitive impact of Brazil on the export demand for United States orange juice; and price and cooperator program expenditure variables were adjusted for changes in exchange rates between the United States and the destination country. The same dummy variable technique used in the 1977 study was again used. The study time period was from fiscal year 1972-73 through fiscal year 1976-77. The estimated returns per dollar invested were \$4.85 and \$14.97 for all contributors and Florida citrus processors, respectively.

In the 1983 study, an error components model [3, pp. 341-5] was used to estimate the variation in the demand for United States orange juice over time and across countries. The same analytical model used in the 1979 study was used. Because of a lack of information on the Brazilian FCOJ price, average Brazilian prices for orange juice imported to the United States were used in the estimation. The study period was from fiscal year 1973-74 through fiscal year 1981-82. The results indicate that the value of orange juice shipments generated by the cooperator (FDOC) program expenditures has been \$2.30 to \$6.80 (depending on the European country) per dollar spent by all program contributors. The estimated returns for all program contributors averaged \$5.51 per dollar invested.

American Soybean Association Cooperator Program

The soybean cooperator program started in 1956. The program is financed by the American Soybean Association (ASA) through legislated checkoff contributions, the FAS, and third party industry contributors in the countries of investment. Third party contributors have provided the largest share of market development funds since 1971. ASA contributed the smallest share of funds between 1970 and 1974. However, by 1980 the ASA share had increased to 34%, surpassing the FAS share of 28%, but still below the third party contributors share of 38%. The program currently supports market development activities in 76 countries.

In the early 1970s, nearly 60% of all expenditures were in Japan. Its share declined steadily to about 22% in 1980. The European Community (EC) share of total expenditures fluctuated between 30% and 40%. Other contributors in Asia and Oceania accounted for 10% to 18% of total expenditures.

In the early years funding was almost entirely for the promotion of soybeans. The emphasis of funding shifted to soybean meal and oil in the mid-1970s. In 1980 the soybean meal share was 26% while the soybean oil share was about 33%. The share of expenditures for soyfood has remained between 10% and 15% since 1972 [13].

Williams and Myers studied the net impact of the ASA and the FAS cooperative foreign market development program on the United States soybean industry and on United States agriculture [13]. Their analysis is based on a 96-equation econometric model which allows for simultaneous determination of the supplies, demands, prices, and trade of soybeans and soybean products in the major trading regions of the world. These regions include the United States, Brazil, the EC (nine members), Canada, Japan, other countries in Asia and Oceania, Africa, and a Rest-of-the-World region. The study period covers the fiscal years from 1969-70 through 1979-80. In this study, cooperator program expenditures were adjusted for changes in the value of the United States dollar abroad and deflated by an index of inflation for the re-

gion. Because expenditures can be expected to have an impact on demand beyond the expenditure year, a three-year average of adjusted expenditures was used in the demand relationships. The measurement of the impact of market development programs on the soybean industry and United States agriculture is accomplished through iterative simulation of the soybean model and the United States agriculture model developed by Chase Econometrics, Inc. [13].

The simulation results indicate that market development expenditures from 1970 through 1980 were responsible for increasing United States soybean acreage and production, the farm price of soybeans, and the wholesale prices of soybean meal and oil. The estimated returns to all contributors average about \$62 per dollar invested while grower returns average slightly lower at \$58 per dollar invested. On the average, the returns to expenditures were higher per dollar expended in the EC than in any other region. In addition, the study shows that a shift in the emphasis of funding from the promotion of soybeans to the promotion of soybean products leads to greater export revenue per dollar expended. The results also indicate that United States market development expenditures increase competing Brazilian soybean, soybean meal, and oil exports. However, actual volume increases in Brazilian exports are many times smaller than the corresponding increases in United States exports.

Cotton Council International Cooperator Program in Japan

Beach and Deariso estimated the impact of Cotton Council International's (CCI) consumer campaign carried out with six major Japanese mills during the five-year period from 1979 through 1983 [1]. The objective of the CCI's consumer campaign was to increase the consumer's awareness of the superior qualities of cotton in apparel and home furnishings. The activities selected were consumer advertising campaigns in magazines for products made chiefly of United States cotton. In the Beach and Deariso study, the amount of cotton utilized by cooperative mills for promoted products was compared with Japan's national cotton consumption trend. It is assumed that the increased cotton utilization by the cooperators above the national trend is attributed to advertising campaigns. After adjusting for inflation and population growth, Beach and Deariso estimated that the consumer campaign has increased the sales of United States cotton by \$13.4 million, which is equivalent to \$17.0 per dollar spent by FAS. The study did not estimate the impact of this campaign on other manufacturers and the competitive position between cotton and synthetic fibers.

United States Wheat Associates' Baking School in Taiwan

The baking school in Taiwan (BST) was established under the cooperative effort of the United States Wheat Associates (USWA) and

the Taiwan Flour Millers Association (TFMA). The school began instruction in 1968. The BST instructional program was modeled after the American Institute of Baking program in Manhattan, Kansas. The emphasis of class instructions was placed on western style bakery products. Between 1968 and 1982, the USWA and the TFMA contributed \$329.6 thousand and \$386.1 thousand, respectively, for the BST. The major objective of this school is to increase the exports of United States wheat to Taiwan. Under the following assumptions: (1) the BST accounted for 40% of the growth in flour consumption for western style wheat foods; (2) 20% of traditional Chinese wheat foods was replaced by western style wheat foods; and (3) the goodwill derived by the USWA's role in establishing and contributing to the program at the BST accounted for 5% of total wheat imports by Taiwan; the FAS estimated the average return between 1968 and 1982 was \$271 per dollar invested by the USWA in the BST [12].

FDOC Generic Advertising in Canada

There are other foreign promotional programs conducted by United States agricultural sub-sectors independent of the USDA. The orange juice generic advertising program conducted by the FDOC in Canada is an example.

Canada is an important expanding market for orange juice. Between 1971 and 1983 Canada's orange juice imports increased 159% (from 36.6 million gallons in 1971 to 94.1 million gallons in 1983). Recognizing the importance of the Canadian market and its potential, the FDOC is engaged in generic commodity advertising in Canada. While the FDOC orange juice generic advertising program specifically mentions Florida orange juice, the program is commodity oriented in that no specific brands were generally mentioned in the past. There is currently a tag program for brands, which identifies the Florida origin of orange juice.

The structure of the import-export market for orange juice products has changed in two directions since the early 1970s. As a result of export market expansion, United States exports of orange juice have increased in recent years. Between 1971 and 1983 United States orange juice exports to Canada increased 90% (from 20 million gallons in 1971 to 38 million gallons in 1983). In addition, Canada has rapidly increased its orange juice imports from other countries, particularly Brazil and Mexico. By 1984, the United States share of total Canadian imports of orange juice had declined to 36% from more than 55% in 1971.

Brazil's success in gaining a dominant market share can be traced partially to freezes in Florida in 1977, 1981, 1982, 1983, and 1985 that severely curtailed United States production of oranges for processing. In addition, the lower Canadian quality standards allow importers of bulk form orange juice to repack their Brazilian imports into lower

Brix juice (38° Brix) than the juice imported from the United States (42° Brix); and there is no tariff on the FCOJ in bulk form, which provides cost advantages for importing bulk Brazilian orange juice.

FDOC generic advertising expenditures have been increased from \$.2 million in 1970-71 to about \$1.0 million in 1982-83. Three research projects have been conducted to estimate the impact of the FDOC's generic advertising in Canada on the consumption and imports of orange juice in Canada. The first study was completed in 1973 [2]. This study deals with the statistical estimation of the consumer demand for FCOJ, chilled orange juice (COJ), and canned single strength orange juice (CSSOJ). The study assumes that the quantity of the particular orange juice demanded is a function of its own price, prices of related orange juices (e.g., the prices of COJ and CSSOJ were used in the demand function for FCOJ), consumer income, current and lagged advertising expenditures, and seasonal dummy variables. Quarterly observations from July-September, 1967, through October-December, 1972, were used [10], and the ordinary least squares method was used to obtain the parameter estimates. The results indicate:

- (1) a strong positive consumer response to FDOC generic advertising for FCOJ existed;
- (2) the consumption of COJ and CSSOJ was not immediately responsive to advertising, but was positively responsive to advertising after a lag;
- (3) the advertising impacts on orange juice consumption were stronger for FCOJ than for COJ and CSSOJ;
- (4) generic advertising had a significant impact on the consumption per buying household for FCOJ and COJ; however, the proportion of households buying COJ and CSSOJ was unaffected by advertising.

The stronger advertising impact on the demand for FCOJ than those for COJ and CSSOJ found in this study may be explained by the size of the FCOJ market relative to the market for the other product forms. During the study period, FCOJ accounted for more than 62% of the total orange juice market.

The second study was completed by Tilley and Lee in 1981 [11]. In this study a simultaneous equations model with five behavioral equations and one identity was estimated using two-stage least squares. The five behavioral relationships are a retail purchase relationship; a retail price transmission or margin function; and one import function each for the United States, Brazil, and other countries. In addition, there is a market equilibrating identity.

Several alternative relationships were considered to measure the impact of commodity advertising on retail orange juice consumption. Of these the inverse form was chosen. The inverse functional form implies a positive but diminishing response to additional advertising with the function asymptotically reaching a maximum. United States

orange juice advertising expenditures were included in the retail purchase equation. An interaction variable for United States and Canadian advertising was also included given the proximity of Canadian population to the United States and the fact that United States advertising can be viewed in a major portion of the Canadian market.

The estimated structural form parameters show that all of the advertising coefficients were of the expected sign; however, the United States generic advertising coefficient was the only advertising parameter larger than its standard error. Even though the results were not conclusive, there were a number of findings of importance. First, there was an estimated complementary relationship between advertising in the United States and in Canada. Second, the results suggest that additional advertising expenditures would have enhanced United States export sales revenues. The estimated revenues were highly variable and particularly sensitive to orange juice advertising levels in the United States. Third, the estimates show Brazilian imports benefited from increases in consumer demand, some of which were generated by Florida advertising. Fourth, because Brazil benefited from Florida advertising, the results suggest that additional advertising would not substantially affect the United States market share. These results, of course, assume that additional money would be spent under the same general advertising strategy that existed in the past. The recently developed tag program to further differentiate Florida product from Brazilian orange juice might change these findings.

Nearly 90% of United States exports to Canada are already packaged, with the rest delivered as high-density bulk juice, either in drums or tanker trucks. All Brazilian juice arrives in 55-gallon drums or in tanker trucks and is packaged in Canada. FCOJ in 6-, 12-, and 16-ounce cans is the dominant form of orange juice consumption in Canada [10]; thus, to use Brazilian FCOJ, firms acquired the expertise as well as equipment to package FCOJ or reconstitute FCOJ for production of chilled orange juice. In order to market the products, several brands of Canadian-packed FCOJ were established. The existence of the facilities and brands for Canadian-packed Brazilian FCOJ reduces the prospect for future domination of the Canadian market by United States suppliers in the short run. Brands are thought to promote loyalty and consumption habits which cause irreversibility. The hypothesis is that once price shocks cause old habits to be broken and new brands are adopted, returning to previous brands may be resisted.

In the third study [7] Lee and Tilley examined United States and Brazilian market share relationships in Canada to test the hypothesis of own-price effect irreversibility as well as substitute price effect irreversibility. In this study, market shares of Canadian FCOJ imports are considered functions of import prices, FDOC advertising expenditures in Canada, a freeze dummy (to capture the impact of the 1977 freeze), and three seasonal dummies (to show seasonal variations in

market shares of FCOJ imported during the year). The method of seemingly unrelated regression was used to estimate the relationships. The method of segmenting variables as described by Nelson was used. The time period used was from the first quarter of 1972 through the second quarter of 1981.

Assuming a decreasing rate of return from advertising, the square root of FDOC advertising expenditures was used in the estimation of advertising impacts on import shares. The estimated coefficients of the advertising variables show that Florida orange juice advertising in Canada had a significant positive effect on the United States market share in Canada for one quarter beyond the quarter during which the advertising actually occurred. The initial impact of advertising was greater than the subsequent impact a quarter later. The estimated coefficients of the advertising variables in Brazil's market share equation show that Florida orange juice advertising efforts had a negative impact on the Brazilian market share in Canada. The results show that the impact was not evident during the quarter when advertising occurred, but the lagged impact was both negative and statistically different from zero.

Discussion

A common argument regarding the response to market development programs is that the full effect is not immediately perceived. Consumers or importers do not respond immediately to a program's pressure, and increased sales are noted only after a sustained period of promotion. This is usually referred to as the cumulative promotional effect. Related to this concept is the idea that if promotions cease, sales will not drop immediately to a level that would exist without promotional activities in the first place. The usual assumption is that the total effect of a dollar's worth of promotional activities is spread out over several time periods. This is called the decay or carryover effect.

In the studies reviewed above, only the Chern and the Lee and Tilley studies investigated the carryover effect of the FDOC generic advertising program in Canada. On the other hand, the Williams and Myers study assumed that the promotional effect lasted for three years. No effort was made to investigate the carryover effect of cooperator program expenditures.

A related issue is the carryover effect of the P. L. 480 program. P. L. 480 aid was originally targeted at the war devastated countries in Western Europe and Japan. The introduction of United States products to these countries in the 1950s laid the foundation for today's large agricultural sales, and developing countries have been the focus of the P. L. 480 program since the 1960s. The higher returns to program expenditures in the EC countries than in any other region found in the Williams and Myers study may reflect the intensity of the P. L. 480 program in these countries in the past years. If this argument is

correct, then the estimated returns per dollar spent may be biased upward.

In the past, P. L. 480 nonconvertible currency credit, the CCC's GSM-102 export guarantee program and GSM-5 direct credit program, and the recent blended credit program (blend of GSM-102 and GSM-5) have been used to expand United States farm exports and market shares in existing markets and promote sales in new untapped markets. The absence of credit program variables in the analytical models used in the studies reviewed above may bias the estimation of the effectiveness of cooperator program expenditures. The exclusion in the analytical models of other trade related programs, such as trade shows, trade information provided by agricultural attachés, and long-term trade negotiations, may also cause the same problems. More research is needed to incorporate all trade related activities in the analytical model to reduce the bias in estimating the economic impacts of individual programs.

The Tilley and Lee study found that United States generic advertising had a positive impact on the demand for FCOJ in Canada. The major reason United States generic advertising expenditures were included in the analysis was because of the proximity of the Canadian market to the United States and the availability of United States commercials in Canada. Similar spillover effects may take at least three directions for cooperator programs: (1) the impact of promoting a United States product on the imports of other United States products in a given country; (2) the impact of promoting a United States product in a country on the imports of the same product in adjacent countries; (3) the combinations of (1) and (2). The regional demand approach used in the Williams and Myers study may minimize the spillover problem mentioned in (2), and does not deal with the problems mentioned in (1) and (3). In addition, the interaction of cooperator programs for different commodities within a country or a region may exhibit a competitive, complementary, or neutral relationship. More research is needed to understand these relationships so that limited promotional dollars can be allocated more efficiently.

The potential of future United States agricultural exports depends not only on the development of new markets but also on the maintenance of developed markets. Both the Canadian studies and the soybean study found that developing countries are major competitors for United States exports in the world market. For example, the market share of United States orange juice in Canada decreased from 55% in 1971 to 36% in 1984, while the share of Brazilian imports increased from 31% to 63% during the same period. The market share of United States soybean and soybean meal (in soybean meal equivalent) in the EC decreased from 68% in 1974 to 56% in 1979, while the combined share of Brazil's and Argentina's imports in the EC increased from 20% to 30% during the same period. The major reason for not import-

ing from the United States is the cost advantage, in terms of low price, that importers found in competing countries. Unless the United States agricultural sector can increase production efficiencies and thus lower the prices of its export products, the United States will probably lose the competitive advantage, i.e. low agricultural product prices, it has enjoyed during the past several decades.

Furthermore, both the Canadian studies and the soybean study show that United States promotional activities not only increase United States exports but also increase the exports from Brazil. Unless foreign consumers can differentiate the United States products from those from other countries, and are willing to pay a premium price, the United States foreign market development programs may create export markets for its competitors in the long run. Therefore, development of promotional strategies to effectively differentiate United States products from those from competing countries becomes an important issue. More research is needed to develop and evaluate these strategies.

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