ECONOMIC EFFECTS of Generic Promotion Programs for Agricultural Exports

Editors

John P. Nichols
Henry W. Kinnucan
Karen Z. Ackerman

Economic Effects of Generic Promotion Programs for Agricultural Exports

Edited By

John P. Nichols
Henry W. Kinnucan
Karen Z. Ackerman

Papers Presented at a
Symposium on Evaluating Economic Effects
of Generic Promotion Programs for Agricultural Exports
Washington, D. C.
February 22-23, 1990

Sponsored by NEC-63 Committee on Commodity Promotion
Foreign Agriculture Service, USDA

Published in Cooperation With the Agricultural and Food Policy Center
Department of Agricultural Economics, Texas A&M University

August 1991

THIRTEEN

Evaluating the Impacts of TEA on Exports to Japan: A Simplified Econometric Approach

Michael J. Dwyer and Kelly Kirby Flowers

Global competition in agricultural trade increased sharply during the 1980s. With it came a rise in unfair trading practices by a number of U.S. competitors and trading partners. To offset the adverse impacts of these practices on U.S. exports, Congress enacted the Targeted Export Assistance (TEA) Program as part of the 1985 Farm Bill. This legislation stated that funds or commodities of the Commodity Credit Corporation (CCC) could be used by the Secretary of Agriculture to counter foreign subsidies, import quotas, or other unfair practices that injure U.S. agricultural exports. The legislation did not specify the means for implementing the TEA Program. However, the U.S. Department of Agriculture chose to implement the statute by using a foreign market development approach with the Foreign Agricultural Service (FAS) acting as the administering agency.

Since its inception in 1986, the TEA Program has been funded in excess of $700 million. Asia, as a whole, received roughly 50 percent of the funding. In terms of single country programming, Japan has received the most attention.

Recipients of TEA funds promote their exports overseas in exchange for generic CCC commodity certificates and supplement these resources with their own. Recipients are either private nonprofit industry groups (such as foreign market development cooperators), regional cooperators, or private firms.

The majority of TEA projects are consumer promotions designed to improve attitudes and increase foreign consumer awareness of U.S. products. This is done through such activities as in-store promotions, media advertising, technical assistance, and trade servicing.

OBJECTIVES AND SCOPE OF STUDY

Since its inception in 1986, the TEA Program has been funded in excess of $700 million. Asia, as a whole, received roughly 50 percent

of the funding, followed by Western Europe with about 35 percent. However, in terms of single country programming, Japan has received the most attention.

Given the large expenditures of public funds, evaluating the effectiveness of the TEA Program is an issue for public discussion and debate. The FAS maintains that evaluation is crucial to the long-term success of its market development programs. However, evaluation historically has been difficult for FAS due to the confounding influence of macroeconomic variables that affect U.S. exports, such as exchange rates and foreign income growth.

Despite the difficulties, this study seeks to develop a simplified econometric methodology capable of isolating the short-term impacts of TEA promotional activities. Specifically, the primary objective is to determine the increase in exports attributable to the TEA Program. In doing so, the study seeks to quantify the relative impacts of TEA and macroeconomic variables in influencing U.S. exports during the period of the TEA Program.

The research objectives were accomplished by selecting for analysis 14 U.S. products promoted in Japan during 1986-88 under TEA. These consumer-oriented, high-value, and primarily horticultural products are avocados, grapes, grapefruit, honey, cherries, frozen corn, peanut butter, walnuts, wine, canned peaches, dried prunes, salmon, grapefruit juice, and kiwi.

METHODOLOGY

While the conceptual framework for this analysis is straightforward, involving the econometric estimation of import demand functions, the methodological approaches range from simultaneous equation models to simpler single-equation models. Due to the constraints of time, data, and expertise, this study takes the single-equation approach.

Theory indicates import demand for a given product is a function of price, demand shifters, and supply shifters. Demand shifters are those variables that cause the foreign demand curve to shift to the left or the right. Common examples include prices of substitute products, income, population, exchange rates, tastes, and promotional efforts. Supply shifters are those variables affecting domestic supply and could include technological advances, prices of production inputs (such as land, labor, and capital), and weather.

Because each product considered is likely to have a different set of demand and supply shifters, the number of variables for which data is needed is potentially immense. Thus, to make the study manageable, it was decided to limit the number of variables to the U.S. export price for each product and a small number of universal demand shifters, i.e., income, population, and exchange rates. The effect of TEA was studied by specifying a binary variable to indicate the time period in which the program was in place.

Such a limited set of variables may be considered unduly restrictive. While recognizing that other variables may be relevant, a main objective of this study was to determine if a simplified approach could be developed to quantify the short-term impact of the TEA Program. Because data collection is time-consuming and costly, it has discouraged evaluation efforts. This study, therefore, adopts the approach of using only data that are relatively easy to obtain and are applicable to import demand across a wide range of products. If import demand models, such as the ones developed in this analysis, are capable of isolating the effects of TEA from the other economic variables, it may not be worth the costs to seek further data.

The Model

The model finally chosen for estimation is:

$$(1) \qquad Q_{i,t} = \alpha_0 + \alpha_1 PRICE_{i,t} + \alpha_2 INCOME_{i,t} + \alpha_3 XRATE_{i,t} + \alpha_4 TEA_{i,t} + \epsilon_{i,t}$$

where: $Q_{i,t}$ is the quantity of U.S. commodity i (i = 1,...,14) exported to Japan in year t; $PRICE_{i,j}$ is the unit value of commodity i exported to Japan computed as the ratio of export value to quantity exported; $INCOME_{i,j}$ is real gross domestic product (GDP) in Japan measured in trillion 1980 yen; $XRATE_{i,j}$ is the yen per dollar exchange rate; TEA is a binary variable used to indicate presence or absence of the TEA Program -- 0 for no TEA and 1 for TEA; α_j (j = 0,...4) are parameters to be estimated; and $\epsilon_{i,t}$ is a random error term.

It should be noted that the above model was not the one originally selected. The original model had per capita income and population as separate variables instead of combining them into one real GDP variable. However, initial testing indicated severe collinearity between per capita income and population, resulting in sign reversals in most of the models. To remove the problem, the two variables were multiplied together to yield the single variable real 1980 gross domestic product (GDP). This solved the collinearity problem and saved a degree of freedom.

Expected Signs of Variables

Economic theory indicates exchange rates have a negative effect on exports and foreign income has a positive effect. Because both these variables were undergoing rapid change over the sample period (e.g., the exchange fell 40 percent from its March 1985 level) and a major research objective was to isolate the TEA impact, it was important to include

exchange rate and income effects in the model. All other things equal, rising export prices should depress export demand; falling prices should stimulate demand. The price variable, therefore, is expected to have a negative sign. The TEA variable, because it assumes a value of one for years in which TEA funding was in place and zero otherwise, is expected to have a positive sign.

Measuring the TEA Effect

While there are a number of ways to measure the impact of TEA, such as using the actual dollar amounts expended, a binary variable was considered the best approach given the research objectives. For example, the parameter estimated for TEA in each regression can be interpreted directly as the annual average export gain (benefit) associated with TEA's market promotion effect.

The TEA Program can be likened to a "treatment" on exports similar to that of a drug as a treatment for a disease. In the case of the TEA Program, the "treatment" typically lasted two to four years. If the "treatment" was successful in boosting exports, the resulting TEA parameter would be positive and significant. However, this approach is limited in that it only indicates past impacts of TEA activities and is not appropriate for predicting future impacts. Nonetheless, the approach was deemed the most suitable to evaluate the impact of a program that can only be analyzed over two to four observations (years) out of 19 to 20 and is preferable to using actual expenditures.

The TEA Program can be likened to a "treatment" on exports similar to that of a drug as a treatment for a disease.

Another issue involves the relationship between the foreign market development program and TEA. Some of the products evaluated had received some foreign market development funds before they received TEA funding. For those products, consideration was given to using expenditures instead of a binary variable under the assumption that activities carried out under each program are similar. However, the pre-TEA expenditures for a number of the products were too small in relation to TEA to have had much impact.

For those products with sizable market development funds, the decision was made, nonetheless, to stay with the binary variable. To use a binary variable for some products and an expenditure variable for others requires multiple methodologies -- each with differing interpretations which subverts the goal of simplifying the approach. However, it is recognized that the actual expenditure approach may be an appropriate alternative for those products in which foreign market development and TEA activities are comparable in size and scope.

The timing of the TEA effect is an important modeling issue, i.e., whether the impact is immediate (felt in the same year) or delayed into the next year. Since different promotional activities were carried out for each product analyzed, the question had to be answered on a product-by-product basis. To address this question, two regression equations were estimated for each product -- one with the binary variable "turned on" in the same year the activity was implemented (the immediate response hypothesis) and one with the binary variable "turned on" a year later (the lagged response hypothesis). The regression yielding the best statistical results (larger *t*-statistic for the TEA variable and overall R^2) served as the basis for discriminating between the two hypotheses.

Trade Policy Distortions

Two types of policy effects exist that might bias results: (1) a broad-based import promotion policy effect, largely unique to the Japanese market, and (2) a commodity-specific trade policy effect. With respect to the first policy effect, Japan has been pressured, especially by the United States, to liberalize its agricultural trade policies. In response to these pressures, the Japanese government has periodically enunciated to Japanese companies the merits of importing. This raised the concern that part of what was being measured by the TEA variable was the effect of Japanese broad-based import promotion policies.

To test this, 80 U.S. horticultural products exported to Japan between 1970-1988 were modelled, using the same variables that were included for the products evaluated in this study. This included "turning on" the TEA variable as though each had received TEA funding during 1986-1988. Only a handful indicated a TEA relationship, including frozen french fries and fresh sweet corn. The frozen french fries, while not included among the 14 products in our study, did receive a TEA allocation so it was to be expected that a relationship would exist. Fresh sweet corn could have tested positive because of spillover effects from TEA promotions of frozen corn. Based on these results, it was concluded that the broad-based import promotion policy effect was not a problem for this analysis.

Assessing the likely impact of commodity-specific trade policies is a more difficult problem. The problem is especially troublesome in cases where the commodity-specific policy change coincides with implementation of TEA. A case in point is cherries. In 1987, the Japanese government agreed to permit U.S. cherries into Japan earlier in the year to accommodate the earlier shipping season of California cherries. This resulted in U.S. cherries beginning their seasonal exports in May instead of June. The extra shipping month did not have much effect in 1987 (May exports were only 1,100 mt, or 10 percent of the annual total), but exports during May accounted for about 30 percent of total annual shipments in 1988 and 1989. Because the TEA Program for

cherries began in 1988, the estimated TEA effect for cherries is likely to be overstated because of the coincident liberalization in trade policy with respect to this particular commodity. No attempt was made to correct for this possible trade policy bias, either with cherries or with other commodities that may have been so affected. Thus, to the extent that commodity-specific trade policies were being enacted during the period of TEA for the commodities under consideration, the estimated TEA effects must be interpreted with caution.

DATA

Data collection for product and country-specific export prices posed a problem. Quoted export prices to Japan for the 14 products were nearly impossible to collect on a consistent basis over a long period of time (1970-1988). In contrast to bulk commodity prices, prices for these high-value products vary considerably by quality and destination. Therefore, the average annual export unit value (f.a.s. basis) from the Bureau of the Census trade data was used as a proxy for price. Export unit value was derived by dividing the dollar value of shipments to Japan by the quantity exported (the dependent variable in equation (1)). Based on the results presented later, this approach seemed satisfactory. U.S. exports, the dependent variable, was also collected from the Bureau of Census.

An issue worth mentioning is that census trade data at the individual product level (known as Schedule B) are known to be subject to substantial measurement error. Nonetheless, these data are the official U.S. government trade data and are readily obtainable (a prerequisite for use in our analytical approach) from FAS or the Department of Commerce. Because the dependent variable (export quantity) and one independent variable (price) are based on these data, the diagnostic statistics (e.g., R^2's and *t*-statistics) must be interpreted with caution. An alternative to the U.S. data is to use Japanese import statistics that are generally acknowledged to be of a higher quality than U.S. export data. This will be discussed later. The data for income and exchange rates were obtained from the International Monetary Fund.

EMPIRICAL RESULTS

Equation (1) was estimated using data for 1970-1988 or various sub-periods depending on data availability. However, in some cases an estimated 1989 observation was added based on data available through August 1989. This was done only in cases in which TEA had a lagged effect on exports or when the TEA Program did not start until 1988, making a second observation critical.

The results that follow represent the best models that were estimated and the analytical conclusions that could be drawn from them.

Of the 14 products, two could not be evaluated due to lack of data. Kiwi export data are available only since 1984 and honey did not receive TEA funding until 1989. Three other products could not be evaluated due to the inability to obtain satisfactory statistical results with the model selected. Canned peaches and dried prunes exhibited consistent sign reversal problems and low explanatory power. In each of the above cases, either the TEA variable, price, income, or exchange rates yielded parameter estimates that were contrary to expectations. The frozen corn model yielded better results in that parameter estimates were consistent with *a priori* expectations. However, the coefficients for the TEA variable and price were not significant, the R^2 was less than .61, and the *F*-value was 6.6. The frozen corn model, therefore, was deemed unsatisfactory for policy analysis purposes.

Of the nine models, seven support the hypothesis that the TEA Program (either immediately or after a lag of one year) increased exports of U.S. products to Japan.

Some of the models had a difficult time accounting for both prices (in dollars) and exchange rates in the same model. When this occurred, the two variables were combined into one price variable, measured in yen. This proved theoretically and statistically acceptable and the resulting model was used for analysis as long as the sign on the estimated parameter was negative.

The final estimated equations of the remaining nine products are listed in Table 1. Of the nine models, seven support the hypothesis that the TEA Program (either immediately or after a lag of one year) increased exports of U.S. products to Japan. Only in the cases of peanut butter and salmon (and possibly avocados) is the hypothesis rejected. Results for individual products, summarized in Figure 1, are discussed below.

Peanut Butter

The *t*-statistics for the economic variables -- price (in $), income, and exchange rates -- indicated all were significant at the .98-.99 level. The model has an adjusted R^2 of .87, an *F*-value of 27.5 (significant at the .99 level), and shows no sign of autocorrelation (Durbin-Watson of 1.9). However, the *t*-statistic for the TEA variable is only .8. This means that the standard error relative to the estimated 117 MT annual impact of TEA is so large that it is tenuous to conclude statistically that the program was effective in boosting exports. Instead, this model suggests most of the reason for increases in U.S. peanut butter sales to Japan since 1986 can be accounted for by a declining dollar and rising Japanese incomes.

TABLE 1. Estimated Import Demand Functions for 9 TEA Products, Japan, 1970-88

Products	Variables					R^2/DW	Data/ TEA Period	F-value
	Constant	Price	Income	Exchange Rate	TEA[b]			
Avocados	-3,541 (-1.1)	-.62 (-.22) [-.03]	19.89 (1.9) [1.6]	—	1,261 (1.1)	.64/2.4	1978-88/ 1987-88	7.0
Cherries	1,407 (.1)	-3,882 (-1.7) [-1.2]	84.6 (2.0) [2.5]	-53.4 (-2.8) [-.6]	2,439 (1.3)	.88/2.4	1977-89/ 1988-89	23.2
Grapes	2,696 (1.3)	-1607 (-2.5) [-.35]	13.4 (2.4) [.78]	-10.6 (-2.2) [-.24]	1,918 (3.7)	.93/1.7	1971-88/ 1986-88	55.6
Grapefruit Juice	-16,323 (-2.2)	-39 (-2.6) [-.07]	137.5 (5.3) [1.2]	—	11,125 (3.7)	.93/1.9	1970-88/ 1986-88	78.5
Grapefruit	155.6 (1.5)	-.62 (-3.6) [-1.24]	1.23 (3.2) [1.69]	-.44 (-2.0) [-.25]	42.9 (2.0)	.82/2.1	1971-89/ 1987-89	21.1
Peanut Butter	1,267 (1.7)	-436 (-2.7) [-.75]	5.03 (3.2) [1.2]	-4.26 (-2.5) [-.4]	117 (.8)	.88/1.9	1971-89/ 1987-89	27.5
Salmon	-147,930 (-3.3)	-14,141 (-3.7) [-.66]	1,017 (7.2) [2.8]	—	4,373 (.3)	.91/2.1	1978-89/ 1988-89	40.0
Walnuts[c]	1.701 (1.1)	-553 (-3.7) [-.2]	10.2 (4.1) [.8]	-8.1 (-2.3) [-.27]	701 (1.5)	.95/--	1971-89/ 1987-89	—
Wine	-162 (-.03)	-23 (-2.0) [-.4]	40.7 (2.7) [1.0]	—	6,788 (2.4)	.86/1.3	1970-89/ 1987-89	35.0

Note: Numbers in parentheses are t-statistics; numbers in brackets are elasticities evaluated at 1988/89 data points, whichever is later in the sample period.

[a] In cases where price could be expressed in yen, the exchange rate variable was omitted.

[b] The TEA variable is lagged one period in the regressions for grapefruit, peanut butter, walnuts, and wine.

[c] Regression estimated by generalized least squares to correct for autocorrelation.

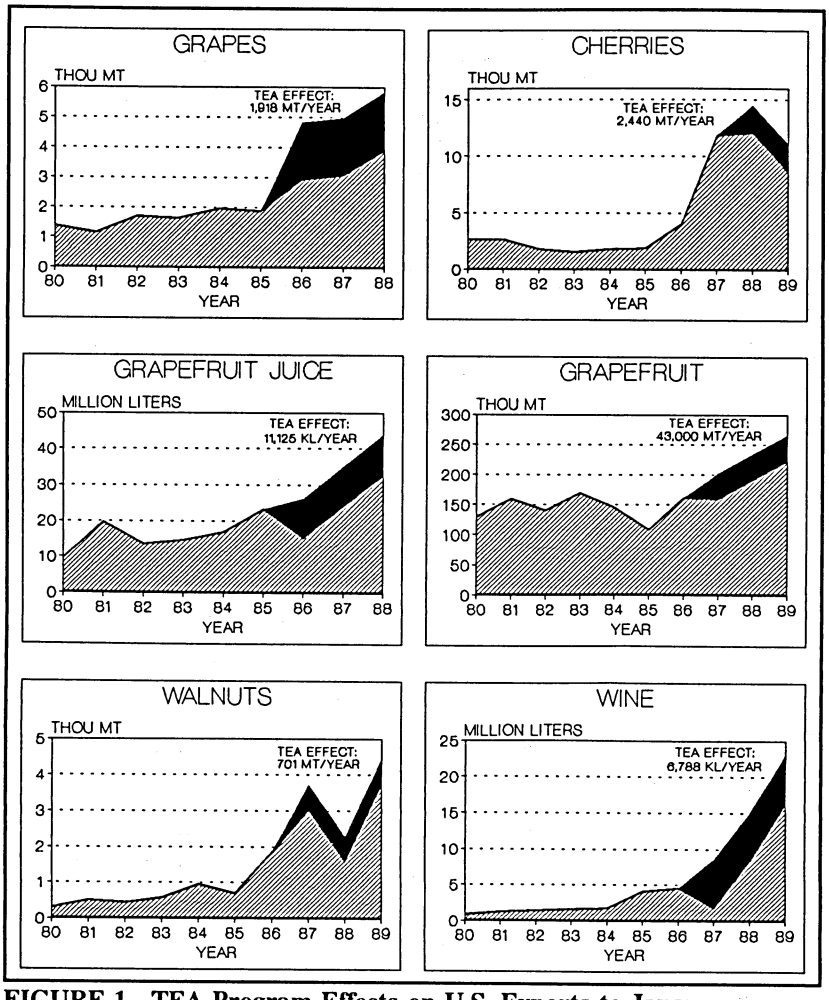

FIGURE 1. TEA Program Effects on U.S. Exports to Japan.

Salmon

The *t*-statistics for dollar-based export unit values (-3.7) and income (7.2) are quite high, indicating significance at the .99 level. However, the exchange rate proved insignificant and was excluded from the model. Overall, the model appears to perform well with an adjusted R^2 of .91, an *F*-value of 40, and a Durbin-Watson statistic of 2.1. However, the *t*-statistic for the TEA variable is low (.3), making it difficult to conclude that the TEA Program has increased Japanese imports of U.S. salmon. While some may argue that it is too early to judge TEA's promotional effect since the program for salmon has only been in operation in Japan for two years, this analysis suggests that increases in exports since 1988 have largely been the result of rising incomes.

Avocados

Overall, the model performs modestly with an R^2 of only .64 and an *F*-value of 7.0. Most of the explanatory power comes from income, the most significant variable in the model. All estimated parameters were of the expected sign. However, the *t*-statistic of the price parameter (in yen) is only -.2, too small to suggest price affected U.S. exports.

The annual impact of TEA was estimated at 1,261 MT with TEA accounting for 70 percent of the total increase in exports during 1987-1988 from its 1986 pre-TEA base evaluation level. However, the *t*-statistic associated with the TEA variable indicates significance at only the 69 percent level, too low to conclude with confidence that TEA was a significant factor in boosting exports. Judging from these results, factors not included in the model probably affected avocado exports to Japan.

Cherries

The fit of for the cherry model is fairly good. All the economic variables are significant at the .87-.98 level. In addition, the model's overall diagnostics are strong -- adjusted R^2 of .88, an *F*-value of 23, and no problem with autocorrelation.

Noting a possible interference with the trade policy effect described earlier, the annual impact of the TEA Program estimated by the model is 2,439 MT, worth a total of $15.6 million over two years. Further analysis suggests that TEA (and possibly the trade policy effect) accounted for 70 percent of the total gain in exports during 1988-1989 from its 1987 pre-TEA evaluation base level. Macroeconomic forces and price changes accounted for the other 30 percent.

However, the *t*-statistic associated with the TEA variable indicates significance at the .77 level -- less than desirable but high enough to be used for analysis. As mentioned, the cherries model might suffer from a trade policy effect that makes interpretation of the TEA variable as a market promotion effect questionable.

Fresh Grapes

This was one of the best models estimated in the study. All three economic variables are significant at the 95 to 98 percent level. The overall model diagnostics are strong with an adjusted R^2 of .93 and an *F*-value of 55.6, and the TEA effect is significant at the 99 percent level.

The average annual impact of TEA was estimated at 1,918 MT during 1986-1988, accounting for $7.35 million in additional sales over the three-year period. Further analysis revealed that TEA-related gains accounted for 58 percent of the total gain in exports during 1986-1988 from its 1985 pre-TEA base evaluation level. Approximately 30 percent

of the total export gain was due to the falling dollar, 9 percent due to income growth, and 3 percent due to the slight decline in export prices.

Grapefruit Juice

Overall the estimated model appears to perform well with an adjusted R^2 of .93, an *F*-value of 78.5, and a Durbin-Watson statistic of 1.9. Price, income, and TEA variables are each significant at the .98 level or better.

The impact of the TEA Program (possibly combined with the aforementioned trade policy effect) is estimated to have resulted in additional annual exports of 11.1 million liters. Over the period 1986-1988, this was worth $16.6 million. The TEA-related sales represent 70 percent of the total gain in exports in 1986-1988 from pre-TEA 1985 base evaluation levels. Rising Japanese income and lower export prices account for another 19 percent and 11 percent, respectively, of export gains.

Fresh Grapefruit

The model estimated for grapefruit has an adjusted R^2 of .82, an *F*-value of 21 (significant at the .99 level), and a Durbin-Watson statistic of 2.1. All variables, including TEA, are significant at the .94 level or better.

The average annual impact of TEA is estimated to be 43,000 MT, worth an estimated $64 million over the 1987-89 period. Further analysis indicated TEA-related gains accounted for 54 percent of the increase in grapefruit exports from its 1986 pre-TEA base evaluation level. (While TEA funds were first used in 1986, its lagged effect means that it did not impact exports until 1987. Therefore, 1986 becomes the base year for evaluation, not 1985.) The economic variables accounted for the other 46 percent increase, led by income and then exchange rates. Rising price during this period had a negative impact on exports, but this effect is more than offset by the positive effects of the other variables.

Walnuts

Of all the models estimated, the walnut model was the only one to exhibit serial correlation (Durbin-Watson of 2.9), thereby introducing bias to the standard errors of the parameter estimates. The Yule-Walker procedure was used to correct the problem. The corrected model has a total R^2 (incorporating the model's structural and residual components) of .95 and is significant at the .94-.99 level. The TEA variable is significant at the 85 percent level -- lower than desirable but acceptable for analysis.

The estimated annual impact of the TEA Program on walnut exports during 1987-1989 is 701 metric tons, worth $9.4 million over the three-year period. This estimate indicates that approximately 45 percent of the total gain in exports over the three-year period can be attributed to the TEA Program. By comparison, rising Japanese income accounted for 21 percent of the gain, followed by a depreciated dollar at 17 percent. Falling export unit values accounted for the remaining 17 percent.

Wine

The wine model has an adjusted R^2 of .86, an *F*-value of 35.0 that is significant at the .99 level, and an acceptable Durbin-Watson statistic of 1.3. Export price, income, and the TEA variable are all significant at the .94 level or better.

The average annual impact of the TEA Program on exports during 1987-1989 is estimated at 6.8 million liters, worth $28 million over the three-year period. This estimate indicates that approximately 69 percent of the total gain in exports during this three-year period can be attributed to the TEA Program. Rising Japanese income and the falling export price of U.S. wine accounted for the remainder.

The average annual impact of the TEA Program on exports in wine during 1987-1989 is estimated at 6.8 million liters, worth $28 million over the three-year period. This estimate indicates that approximately 69 percent of the total gain in exports during this three-year period can be attributed to the TEA Program.

ELASTICITIES

Export price elasticities for the most recent year evaluated (1988 or 1989) suggests U.S. exports to Japan are generally price inelastic (Table 1). Of the nine products, seven have elasticities under -1.0, with five under -.5. This means, for example, that if U.S. export prices for fresh grapes rise by 10 percent, export volume to Japan is expected to fall by only 3.5 percent, all other things unchanged. The elasticity estimates appear to be consistent with the notion that the Japanese import market is primarily a quality and a reliable supply-conscious market and therefore not price-sensitive, at least at the importer level. If export prices were to rise, say in response to a short crop, Japanese import demand would drop only marginally once the market is accustomed to purchasing the product. Only two products, cherries and fresh grapefruit, have price elasticities greater than -1.0.

Income elasticities for the most recent year evaluated (1988 or 1989) suggest that U.S. exports of these products are mostly income

elastic. Six of the nine products show income elasticities substantially greater than 1.0 with two in excess of 2.0. If real Japanese income grows by 5 percent, U.S. exports of these products will grow by 6 to 14 percent, other factors constant. Three products -- grapes, walnuts, and wine -- have income elasticities of about .8, suggesting that U.S. exports of these products will closely follow overall Japanese economic growth.

Yen-dollar exchange rate elasticities could be estimated only for cherries, grapes, grapefruit, peanut butter, and walnuts because of collinearity problems. The estimated elasticities for these products suggest Japan is an inelastic market with respect to exchange rates with elasticity estimates ranging from -.25 to -.64. This means that if the dollar rises 10 percent against the yen, U.S. exports of these products should not decline more than 2.5 - 6.5 percent. Fluctuating exchange rates affect the price Japan must pay for imports. Thus, the small elasticities are good news for U.S. exporters in that a strengthening dollar will have minimal effect on exports to Japan.

SUMMARY AND CONCLUDING COMMENTS

A primary objective of this study was to determine whether a simplified approach to econometric modelling was feasible for evaluating the short-term impacts of the TEA Program. To make the study manageable, only 14 products receiving TEA funding in Japan were considered in the evaluation process. Of these, nine were successfully estimated. While this indicates the approach will not work for all TEA programs, it does suggest the approach is useful in enough instances to be worth pursuing in TEA evaluations.

The results of this study suggest simplified econometric modeling offers useful insights into the potential impacts of export promotion programs.

Several possibilities exist for improving the empirical specification of the import demand models. Foreign import data tend to be more accurate than U.S. Census export data and should be used when available. Measuring price as import unit value instead of export unit value when possible is preferred for similar reasons. In addition, the import unit value is a c.i.f. value instead of an f.a.s. value, thereby permitting price to reflect transportation costs.

A limitation of the present study is the failure to consider prices charged by U.S. competitors. Extending the model to include the price of products competing directly with the U.S. product for Japanese market share may improve the specification. In addition, only TEA-related impacts were analyzed. The model could be extended to evaluate the long-run impacts of the Cooperator and related TEA Programs when comparable in size and scope. In this case, expenditure data would need

to be assembled to indicate the level of market development activity over time. Finally, further attention needs to be given to methods for removing the effects of changes in trade policies. Consideration of trade policy changes is especially important when the changes coincide with TEA activities, as was the case in this study for cherries and possibly grapefruit juice.

Despite the foregoing caveats and limitations, the results of this study suggest simplified econometric modeling offers useful insights into the potential impacts of export promotion programs.

ACKNOWLEDGEMENTS

This project would not have been possible without the considerable assistance rendered by many of our colleagues in the Foreign Agricultural Service. Special thanks to Kathy Brunett and Dave McGuire for their assistance in helping us in the collection of data used in the econometric models and for helping us understand the workings of the TEA Program, especially as it related to activities in Japan. In addition, we would like to express our appreciation to Suzanne Hale, Jim Grueff, and Ed Missiaen for their insight into the role that shifts in trade policy have had on exports to Japan and how they might interfere with the measuring of the TEA effect. Lastly, we would like to thank Phil Mackie, Dan Conable, Beth Callanan, Bob McConnell, and Dewain Rahe for their helpful suggestions and for reviewing the manuscript for factual accuracies. Despite the review this study received by the individuals above, the views contained in this report are those of the authors and do not necessarily represent those of the Foreign Agricultural Service or the U.S. Department of Agriculture.