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Measuring the Impacts of US Export Promotion Program for Wheat in Selected Importing Regions

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Measuring the Impacts of US Export Promotion Program for Wheat in Selected Importing Regions

We examine the impacts of major factors affecting the export demand of wheat with a special focus on the impacts of export promotion programs on US wheat. Study results show negative impacts of own-price and real exchange rate on export demand of wheat, while the real GDP, price of corn, and export promotion expenditure had positive and significant impacts. The per dollar returns to wheat export promotion expenditures were \$1.49, \$0.42, and \$2.01 for Middle East, Pacific Rim, and Mexico, respectively.

Introduction

With the export of more than 20 percent of total annual agricultural production in the last two decades, agricultural export markets seem crucial for the US economy in general and US agricultural sector in particular. The Foreign Agricultural Service (FAS) of the United States Department of Agriculture (USDA) reports a drastic increase in the export value of US agricultural products from \$ 26.7 billion in 1984 to \$53 billion in 2001 (USDA, 2002). With the changing technologies and growing trade agreements, global economy is expected to expand by annual 3 percent over the next decade (Perez, 1998). Expansion of global economy offers both opportunities and challenges to US farmers to capture the emerging markets and strengthen the market position of US agricultural commodities (Onunkwo and Epperson, 2000).

Most of the US crops are either in increasing or constant trend of production and domestic demand is not sufficient to absorb the growing productivity of US agriculture (Henneberry and Lu, 2000). Without strong agricultural exports, more agricultural products will end up staying in the domestic market bringing price down and driving farmers out of the business. This is true for wheat where total export consists of 43.5 percent of total production. Realizing the significance of agriculture export markets, federal government has been supporting the US agriculture sector in expanding and fortifying market position in the export market by implementing the Foreign Market Development Program (FMDP) and Market Access Program (MAP).

In recent years, however MAP and FMD programs are under scrutiny of the members of congress, the media, and the taxpayers for its controversial financial allocation and support to large US companies (Halliburton and Henneberry, 1995). As a result, FMD funding decreases substantially from \$325 million in 1985 to \$ 90 million in 2000. With the growing scarcity of federal support for the promotion of agricultural products, there exists an urgent need to evaluate the efficiency of taxpayers dollars invested for the promotion of agricultural commodities. Without analysis, the importance of export promotion cannot be justified. More specially, failure to measure the effectiveness of export promotion program for US grains leaves the future federal support uncertain.

This study aims to assess the effectiveness of non-price export promotion for US wheat by analyzing the impact of federal export promotion for wheat. US wheat garnered approximately 25 % of total MAP allocated for export promotion of major US grains in 2001 making it one of the major sectors of federal promotion support. In the mean time, marketing of substantial promotion of US wheat completely depends on international wheat markets where there exists a growing competition because of emerge of new competitor countries. Despite the significance of wheat in national promotion program and international export markets, little scholarly work has been carried out to examine the impacts of export promotion program on the export demand of wheat. There exists only one unpublished report on the impacts of export promotion program on wheat by Henneberry and Lu (2000) but it does not follow the rigorous econometric analysis.

Our study first reviews the literature existing in the area of efficiency of export promotion program. A review of importance of analyzing the effectiveness of export promotion program for wheat will be presented. Then, an appropriate export demand model using economic principles and past empirical research will be developed. The paper will end up with economic analysis and presentation of research findings.

US Export Promotion Program

The Foreign Agricultural Service (FAS) of United States Department of Agriculture (USDA) promotes US agricultural commodities in overseas markets by implementing two major non-price export promotion program: The Foreign Market Development Program (FM DP) and Market Assess Program (MAP). Both programs basically aim to strengthen and expand the market position of the US agricultural commodities in export markets by assisting eligible trade organization and cooperatives. FAS develops partnership with agricultural cooperatives, foreign organizations involved in the importing of US agricultural commodities to share the cost of overseas marketing and promotion programs which include market research, trade shows consumer promotions and trade servicing (Armah and Epperson, 1997).

The FMD programs dates back to the 1955 and was especially proposed to support the generic promotion of bulk agricultural commodities in developed and developing countries (Onunkwo and Epperson, 2000). The Target Export Assistant Program (TEA), which was replaced by Market Promotion Program (MPP) in 1991, was introduced in 1985 to maintain and expand foreign markets for the exports of specific commodities disadvantaged by foreign subsidies, import quotas, or other unfair trade practices (Halloburton and Hennberry, 1995). The total FAS funding for FMD and MAP were \$34 and \$90 million respectively in 2001 (USDA, 2002). The MAP, formerly the Market Promotion Program (MPP), encourages the development, maintenance and expansion of commercial export markets for agricultural commodities. Activities financed include consumer promotion, market research, technical assistance and

trade servicing (Ackerman, 1991). MAP uses funds from the USDA Commodity Credit Corporation (CCC) to support US producers, exporters, private companies and other trade organizations finance promotional activities for US agricultural products (USDA, 1996).

Out of total MAP support for the promotion of US agricultural products, USA Rice Federation, US rice Produce Association, US Wheat Associates, US grain Council, The Popcorn Board and North American Export Grain Association collected 7.9 million federal dollar to promote wheat, rice, corn, barley, and sorghum in international markets. FAS offers aggregate budget for the export promotion of corn, barley, and sorghum. Out of the \$7.9 million MAP support; approximately \$1.9 million was allocated to wheat promotion program. Asia represents the major US grains in the Asian market in different promotion (USDA, 2001).

The FMD also known as the Cooperator Program aims to remove trade barriers and constrains to develop, maintain, and expand long-term export market for US agricultural products (USDA, 2001). The FMD supports producers of US agricultural products and non- profit US agricultural and trade organizations except tobacco, including small volume export commodities in developing new foreign markets and increasing market share in existing markets. FMD's overseas promotion focuses on generic US commodities rather than brand-name products (USDA, 1996). Out of the \$34 million FMD in 2001, US Wheat Associates, garnered \$5.9 million. Which is approximately 18 percent of the total FMD program budget for 2001 (FAS, 2001). In addition to MAP and FMD program, there exists few other smaller promotion program for US grains but most of these programs are inconsistent and have only been implemented for a couple of years resulting in lacking of historical series data for econometric purposes.

LITERATURE REVIEW

Several studies have been carried out to evaluate the impacts of US export promotion on different US agricultural products. Research article analyzing the efficiency of export promotion programs exist for tobacco (Rosson et al., 1986), meat and poultry products (Le et al., 1997; Comeau et al. 1997), almonds (Halliburton and Henneberry, 1995; Kinnucan and Christian, 1997), walnut (Weiss et al., 1995) pecan (Onunkwo and Epperson, 2000), fruit and fruit products (Rosson et al. 1986; Armah and Epperson, 1997; Fuller et al., 1986; Lee et al., 1979) and cotton (Solmon and Kinnucan, 1991). Except one unpublished paper by Henneberry and Lu (2000) on wheat, no research have examined the efficiency of export promotion for the major US grains.

In the beginning, commodity promotion programs mostly focus on analyzing the impacts of advertising on retail markets and consumers expenditure (McClellan et al. 1971; Huchman et al., 1974). Only after 1982, systematic analyses of impacts of export promotion program have been carried out (William et al., 1982). Previous researches have shown the both positive and negative impacts of export promotion programs on

producer welfare but mostly positive and significant effects of export promotion on US export. However, most of these studies have produced different promotion elasticities and rates of returns. It is difficult to generalize the overall effects of the promotion program since each study uses a different modeling approach.

Rosson, Hammig and Jones (1986) analyzes US promotion programs for apple, poultry and tobacco by using an econometric model at regional levels for Western Europe, the MidEast, and Southeast Asian countries. In this study, US export sale of each commodity was specified as a function of US export price in dollar per metric ton, the major competitor's price in dollar per metric ton, regional intercept dummy variables, and real US expenditure for export promotion in dollar. The study results show positive impacts of promotion efforts with a significant return of \$ 60 for apples and \$ 31 for tobacco for each dollar invested in export promotion program. However, the result was not statically significant for poultry.

Using a single equation model, Le et al. (1997) estimate the impact of various factors on import demand of US red meat in Singapore, Taiwan, South Korea and Hong Kong. The analysis suggested a positive and significant impact of export promotion program for South Korea, which is the largest importer of US red meat. The impact of export promotion was positive but statistically insignificant on import demand of red meat in Hong Kong and Singapore. Further simulation analysis of reallocation of 90% of promotion expenditure from Hong Kong and Singapore to Korea showed an increase of 156% of US export sales. An Analysis of impacts of MPP/TEA advertising and promotion expenditure by Comeau et al. (1997) also shows a significant influence of export promotion programs in strengthening the Japanese demand for US beef. However, the analysis fails to show the positive and significant role of promotion program for US pork and poultry.

Halloburton and Henneberry (1995) examine the effectiveness of the federal export program for US almond export by using the panel data for the five Pacific Rim countries, including Hong Kong, Japan, Taiwan, Singapore and South Korea. The estimated almond models were in the Cobb Douglas linear and exponential functional forms. The findings of the research show no impact of promotion program in Singapore and South Korea but a positive and significant impact in Japan, Taiwan, and Hong Kong. The per dollar returns of promotion program were \$ 4.95, 5.95, and \$8395 in Japan, Hong Kong, and Taiwan respectively. A similar study by Kinnucan and Christian (1997), by using the Nerlove and Waugh's theory of cooperative advertising in the Pacific Rim, fails to present any conclusion about the impacts of export promotion because of instability of the estimated elasticities.

Onunkwo and Epperson (2000) conduct an analysis of the impact of major factors affecting the export demand for US pecans in Asia and the EU. In this analysis, the demand response due to promotion was

significant for both Asia and EU. The results reveal a return of \$ 6.45 in Asia and \$6.75 in the EU for per dollar of promotion expenditure on US pecan. Furthermore, some spillover benefits for pecan export were observed from almond export promotion in Asia and walnut export promotion in the EU. Findings of Weiss et al. (1996) on the effectiveness of the promotion programs for walnuts in Japanese market were also consistent with the study results of other researchers. The study results showed a positive impact of promotion program and return of \$5.85 in revenue per dollar of promotion expenditure.

Lee, Myers, and Forsee(1997) analyze the efficiency of US promotion program on the export demand of Florida orange juice by using ordinary least square technique on a double log model. The analysis shows the positive response of promotion program and an increased export of orange juice to the nine European countries by 36% in 1972-73 and by 23% in 1976-77. One dollar invested in promotion program generated \$0.50 in Austria and \$11.50 in Sweden. The study results further show that price reduction would have been two to four times more expensive for increasing demand than the promotional program. The study concluded that promotion program would be the superior method of increasing export demand in comparison to price reduction.

Using a single demand equation model, Armah and Epperson (1997) conduct an evaluation of export promotion program on export of US frozen concentrated orange juice. The study results suggested negative relationship of own price and real exchange rates with the export demand of US frozen concentrated orange juice export. However the analysis further shows the positive relationship of the price of Brazilian frozen concentrated orange juice exports, the GNP of the importing countries and export promotion programs on export demand of US frozen concentrated orange juice.

Fuller et al. (1992) carry out an empirical analysis of the promotion of the US fresh grape fruit in Canada, Japan, France, and the Netherlands by including exchange rates as a vital specification for agricultural research. The researchers found the significant effect of exchange rates on export quantity and promotion for Japan, France, and the Netherlands. The returns per dollar of promotion expenditure for Japan, France and Netherlands were \$5.02, \$4.13 and \$6.65 respectively. In this analysis, export promotion program enhanced exports of US fresh grape to Japan, France and Netherlands by 11% 23% and 15% respectively.

Williams (1985) analyzed the effects of US export market programs for soybean and its products by using a 96-equation simulation model that used extensive data for importers and exports of whole soybeans, soybean meal and soybean oil. The analysis showed the significant impact of export promotion programs on the US soybeans industry with a return of \$ 62 for each dollar invested in export promotion program. The estimated export promotion expenditure elasticity of soybeans was 0.029 for the EEC0.041 for Japan and 0.045 for the rest of the world.

Solomon and Kinnucan (1991) examined the effects of non-price promotion on the export demand for US cotton by using a modified Armington model. In this analysis the short run elasticity of export demand with respect to non-price promotion was highest in Japan with a value of 0.25. The elasticity values were smaller or not statistically significant for other Pacific Rim regions. The export promotion of cotton in the Pacific Rim appeared to have a positive marginal return indicating the effectiveness of export promotion.

DATA

Researchers working in the area of analysis of export promotion program have mentioned the limitation of export promotion data (Onunkwo and Epperson, 2000; Rosson et al, 1986 and Halliburton and Hennery 1995). Federal funding, check-off programs, and contribution of foreign third country cooperators support most of the funding for export promotion program. But due to the unavailability of accurate data about promotion expenditure contribution of all three parties involved, our study is limited to the analysis of federal export promotion program especially the FMDP and MAP. Annual FMDP and MAP funding from 1996-2001 wheat.

Annual observations from 1996-2001 for US export volume wheat to Middle East (Israel, Egypt), Pacific Rim (Japan, South Korea, Philippines, and Taiwan), and Mexico was collected from official web side of FAS (<http://www.fas.usda.gov>). The export price of rice, wheat and corn were calculated by dividing the annual export by the corresponding volume. In spite of controversies surrounding for the use of implicit unit values (Kravis and Lipsey, 1974), Onunkwo and Epperson, 2000 reported minor estimation bias for all countries in general and developed economies in particular. The information of GDP, exchange rate, and CPI were collected from the Asian Development Bank.

Model Specification

In order to find out the effectiveness of federal funding for export promotion of US wheat, a single export demand function has been specified. Use of single equation methods to estimate the parameters in a simultaneous system of equation may result in a simultaneity bias leading to false conclusions (Onunkwo and Epperson, 2000). However, marketing researchers have supported the idea of using single equation system when importing countries face a highly elastic supply curve or show a price taking behavior (Binkley, 1981; Fuller et al, 1992; Arnade and Davison, 1989). Major portion of US wheat is consumed domestically which places importing countries in a weak position to influence the export price of US wheat. So it supports using a single equation model for this study. The key economic variables affecting the

total import demand are assumed to be own price, cross-prices, GDP, exchange rate, promotion expenditure, and time.

$$Q_{rt}^* = f(PRW_t^*, PRR_t^*, PRC_t^*, Y_{tr}^*, EX_{at}^*, EXP_{rt}^*, T_t)$$

$$PRW_t^* = PRW_t / I_{at}$$

$$PRR_t^* = PRR_t / I_{at}$$

$$PRC_t^* = PRC_t / I_{at}$$

$$Y_{tr}^* = Y_{tr} / I_{at}$$

$$EX_{at}^* = EX_{at} / I_{at}$$

$$EXPW_{tr}^* = EXP_{tr} / I_{at}$$

Where dependent variable (Q_{rt}) is the total volume of US wheat export to the selected importing regions in metric tons. Subscript ‘r’ represents the three selected wheat importing regions i.e. Middle East (Israel and Egypt), Pacific Rim (Japan, South Korea, Taiwan, and Philippines), and Mexico and ‘t’ represents the time period from 1996 to 2001. The explanatory variables are PRW_t , price of wheat; PRR_t , price of rice; and PRC_t , price of corn in dollar per metric ton. Other region specific explanatory variables include $EXPW_{tr}$; wheat export promotion expenditure; Y_{tr} , gross domestic product in billion US dollars, and consumer price index (base year 1990) in the selected wheat importing regions (Ir) and the United States (Ia). T_t , which is the trend variable, is included in the model to capture the time-specific effects that impact export demand of US wheat.

Economic principle suggests an inverse relationship between own price and quantity demand of a commodity. Therefore, own price is expected to be negatively correlated with demand for US wheat. Price of corn and rice, which are two major US grains, is also included in the model to find out the complementary or substitutional relationship among wheat, rice, and corn. Increase in the income of importing nation likely to have positive impacts on the export demand of major US grain, therefore a positive relationship is expected between GDP and import demand of US wheat. Impacts of export promotion program remain the central issue of our study. And US federal export expenditures on wheat are

expected to be favorable. Therefore, a positive relationship is expected between the export demand of US wheat in the major wheat importing regions and expenditure on wheat promotion program. The exchange rate was included in the model to examine the influence of exchange rate fluctuations on foreign demand for US wheat. A strong dollar or gain in the strength of US dollar with respect to domestic currencies of the selected wheat importing countries decreases the quantity demand of wheat. Therefore, a negative relationship was expected between exchange rate and quantity demanded of the US wheat.

In order to allow the intercept and slope coefficient to change by wheat importing regions of the world, dummy variables were included in the model. The dummy variable D1 and D2 represents the Middle East and Mexico while the Pacific Rim represents the intercept. The dummy variables that allow annual export relationships to change according to interaction or slope shifters, WPR*D1, RPR*D1, CPR*D1, GDP*D1, EXR*D1, EXP*D1, WPR*D2, RPR*D2, CPR*D2, GDP*D2, EXR*D2, and EXP*D2, which allow differences in the effects of own-price, cross-price, income, exchange rate, and promotion expenditures on US export to Middle East and Mexico were included in the model. The equation was estimated by backward selection procedure of OLS using white's heteroskedastic-consistent covariance matrix to correct the estimates for an unknown form of heteroskedasticity. Finally following functional form for US wheat export demand has been selected on the basis of signs of estimated coefficients suggested by economic theory and statistical tests of significance.

$$\begin{aligned} \ln Q_{rt}^* = & \beta_0 + \beta_1 PRW_{rt}^* + \beta_2 PRC_{rt}^* + \beta_3 PRR_{rt}^* + \beta_4 Y_{rt}^* + \beta_5 EX_{rt}^* + \beta_6 EXPW_{rt}^* + \beta_7 T + \\ & + \beta_8 PRW_{rt}^* D1 + \beta_9 PRC_{rt}^* D1 + \beta_{10} PRR_{rt}^* D1 + \beta_{11} Y_{rt}^* D1 + \beta_{12} EX_{rt}^* D1 + \beta_{13} EXPW_{rt}^* D1 + \\ & + \beta_{14} PRW_{rt}^* D2 + \beta_{15} PRC_{rt}^* D2 + \beta_{16} PRR_{rt}^* D2 + \beta_{17} Y_{rt}^* D2 + \beta_{18} EX_{rt}^* D2 + \beta_{19} EXPW_{rt}^* D2 + v \end{aligned}$$

Results and Discussions

The region specific descriptive statistics of real quantity, wheat price, and export promotion are presented in Table 1. Table 2 presents the parameter estimates of the export demand equation for US wheat. R^2 , which presents variation in US exports of wheat as explained by model was 93% indicating excellent goodness-of-fit of our model. The region-specific estimates of Table 2 show signs consistent with our expectation. For example, the own price-elasticity and exchange rate elasticity of wheat export were

negative showing the negative impacts of increased price of wheat and strong US dollars on export demand of wheat. The cross-price elasticities for wheat with respect to corn and rice yield were positive and negative respectively, indicating substitute and complementary relationship with US wheat export. In our analysis, US wheat exports were positively related to gross domestic product and wheat promotion expenditure indicating that increase in the level of income of importing countries and wheat export promotion expenditures affect export promotion of wheat favorably.

TABLE 1. Descriptive Statistics of Real Quantity, Wheat Price, and Export Promotion 1996 – 2001

Regions	Variables	Mean	Minimum	Maximum	Standard Deviation
Middle East	Q	18872.22	3968.918	35570.64	14006.08
	WPR	1.095984	0.831601	1.69736	0.285934
	EXP	2960.471	68.99023	9102.964	3577.703
Mexico	Q	13035.8	2493.341	15980.25	8690.927
	WPR	1.155006	0.332217	1.741583	0.864145
	EXP	1796.963	1494.848	3254.389	277.492
Pacific Rim	Q	14589.51	6693.945	28233.6	7259.936
	WPR	1.260657	0.288057	1.908131	0.875253
	EXP	2965.343	2965.343	6117.577	1627.588

Sources: World Bank, IMF, Asian Development Bank, and US Wheat Associates

The cross-price elasticity for wheat with respect to rice for Middle East and Pacific Rim was negative indicating a complementary relationship with US wheat exports. Cross-price impacts for wheat though inelastic in most of the importing regions were low, -0.33 and -0.11 for Middle East and Pacific Rim respectively. Rice consists of staple food in Middle East and Pacific Rim regions and results show that increase in the price of rice does not change the rice loving habit of people of the regions. The cross-price elasticity of wheat with respect to rice for Mexico seemed to be highly inelasticity (0.0003) but positive or substitution relationship with US wheat exports.

The cross-price elasticities of wheat with respect to corn for all major wheat importing regions show a inelastic but positive sign indicating a substitution relationship with US wheat exports.

Though inelastic, impacts of cross price were 0.32, 0.08, and 0.08 for Middle East, Pacific Rim and Mexico Respectively.

The Pacific Rim (Intercept regions) market for US wheat exports was sensitive to own-price but shows an low own-price elasticity of -0.29 (Table 3) as did Mexico. The Middle East region shows a much higher sensitivity to own price, thus, a one percent increase (decrease) in the export price of US wheat resulted in nearly one percent (0.96) decrease (increase) in the quantity of wheat exported to Middle East Region, and less than one percent to the remaining markets, *ceteris paribus*.

Table 1. Estimated Export Demand Equation for US Wheat, 1996-2001

Variables	Coefficient estimate	Standard error
Constant	14.39*	0.141
Wheat Price	-0.167****	0.107
Corn Price	0.06	0.08
Rice Price	-0.021	0.01
GDP	0.0135*	0.002
Exchange rate	-0.0186**	0.009
Promotion	0.00006*	0.00001
Time	0.004	0.005
Wheat Price* D1	-0.48	0.80
Corn Price *D1	0.71	0.65
Rice Price *D1	0.02*	0.001
GDP* D1	0.02*	0.001
Exchange rate *D1	-0.21	0.16
Promotion *D1	0.000025	0.00002
Wheat Price* D2	-0.72210*	0.081
Corn Price* D2	0.302*	0.049
Rice Price* D2	-0.043***	0.042
GDP* D2	2.587**	0.47
Exchange rate* D2	-0.807*	0.23
Promotion* D2	-0.000036*	0.000005
D1	0.37	0.78
D2	4.16*	0.97
R- Square	93	
DF	20	
F -Test	47.66	
Number of observation	42	

Note: *, **, ***, **** on the coefficient estimates denote 1, 5, 10, and 15 percent levels of significance respectively. Base year is Pacific Rim, D1 for Mexico, and D2 for Mid east.

As expected, each dollar of promotion program expenditure generated a positive quantity of wheat export from United States to the importing regions. The elasticity estimated displayed in

Table 3 show that one percent increase in wheat promotion expenditures generates 0.06%, 0.24%, and 0.24% in additional exports for US wheat in Middle East, Pacific Rim, and Mexico respectively. Impacts of wheat export promotion programs on revenue have been examined using the elasticity estimates and results are presented in Table 4. Generally, the results show that US wheat sales to the major importing countries were favorably influenced by promotion program expenditures. The study results show that use of one dollar for export promotion in the Pacific Rim and Mexico regions generated 1.49 and 2.01 dollars respectively. The marginal returns to export expenditure indicate that value of wheat export generated by export promotion program is enough to offset the expenditures on the export promotion programs in Middle East and Mexico. Even though, the impacts of wheat export promotion program on Pacific Rim is positive, the marginal return to per dollar export promotion was only 0.42.

TABLE 3. Elasticity Estimates for Major Importers of US Wheat

Variable	Middle East	Pacific Rim	Mexico
Wheat Export Price	-0.96	-0.29	-0.29
Corn Export Price	0.32	0.08	0.08
Rice Export Price	-0.33	-0.11	0.003
Real GDP	1.12	0.16	0.07
Exchange Rate	-0.03	-0.05	-0.05
Promotion	0.06	0.24	0.24

As expected, the real exchange rate of the importing countries displayed a negative relation with quantity demanded of US wheat exports to the importing countries. A one percent rises in value of the importer's currency with respect to the US currency, resulted in less than proportional decrease in quantity of US wheat export demanded, *ceteris paribus*. The negative impacts were small for US wheat to Middle East, Pacific Rim, and Mexico. The real exchange rate impacts of Pacific Rim are similar to that in Mexico. The trend term was positively related to export demand for US wheat. This positive relationship may have been due to the fact that falling real prices of US wheat exports were dominant over the total period of study though real prices tended downward during the last part of the study period. Export demand for US wheat exhibited a positive relationship with the real income of the importing countries. Increasing real gross

national products per capita, over the reporting period had the most positive impact on exports to the Middle East. Statistical result indicates that the income effect in the Pacific Rim and Mexico were similar though lower than in the Middle East region.

Table 4. Estimated promotion program Impacts on US Wheat Export Demand and Revenue by Region over Study Period 1996-2001

Region	Real Mean Wheat export Value	Real Mean Promotion Expenditures	Marginal Return to Promotion Expenditures
Pacific Rim	18392.36	2965.34	1.49
Middle East	20683.65	2960.47	0.42
Mexico	15056.43	1796.96	2.01

Summary and conclusions

This study examines impacts of major factors affecting the export demand for US wheat in Pacific Rim, Middle East, and Mexico with an especial focus on the impacts of wheat export promotion program on export demand of wheat. In order to analyze the issue, an export demand equation for US wheat was developed and backward procedure of ordinary least square method was used. Generally, the results were positive and in support of wheat export promotion program. The returns per dollar of promotion expenditure of wheat were \$1.49, 0.42, and 2.01 for Middle East, Asia Pacific, and Mexico respectively. As expected export price was negatively related to the quantity of US wheat exports demanded in all wheat importing countries. Impacts of time, GDP and export promotion were positive and consistent with the finding of other researchers.

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