A Cost-Benefit Analysis of USDA's International Market Development Programs

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FOREWORD

Scope

This study evaluates the impacts of the United States Department of Agriculture (USDA)'s Market Access Program (MAP) and Foreign Market Development Program (FMD) using guidelines contained in the Office of Management and Budget (OMB) *Circular A-94*.

Sponsor

This study was sponsored by the United States Department of Agriculture, Foreign Agricultural Service; the views expressed herein are strictly those of the authors.

Contributors

The study was prepared by IHS Global Insight's Agriculture Service economists. Contributors from the Agriculture Service are Stewart Ramsey, Principal, and Tom Jackson, Principal.

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EXECUTIVE SUMMARY

Introduction

The United States operates a comprehensive agricultural export promotion system, partnering USDA's Foreign Agricultural Service with nonprofit trade associations representing commodity or regional interests. Among the programs supported by USDA are the Market Access Program (MAP) and the Foreign Market Development Program (FMD). As one of the world's leading agricultural exporters with fiscal year (FY) 2009 exports of $96.6 billion, these programs play an integral role in USDA's mission of increasing U.S. agricultural exports. Hence, public-sector support for MAP and FMD is important to keeping overseas market development successful, as small firms and producer groups oftentimes cannot maintain a consistent export marketing effort because of market and policy risks and lack of critical mass. Following implementation of the 2002 Farm Bill, overall annual market development spending by USDA and its industry partners in the MAP and FMD programs has grown by nearly $250 million between 2001 and 2008, resulting in total partnership spending worldwide exceeding $568 million a year. Despite their contribution to U.S. agricultural exports, these programs have been criticized for promoting "corporate welfare." Supporters of the program believe that such efforts are necessary to enable U.S. exporters to be competitive in the global market with other countries whose export promotion activities are partially funded by their governments. Further, they feel such programs provide benefits to the entire farm sector and improve the overall economy. On the other hand, opponents argue that the increase in exports is merely the result of existing market conditions rather than government-assisted promotion expenditures; if such activities were beneficial to the industry, then government assistance would be unnecessary.

This report updates a larger work completed in 2006. The study's focus is four-fold: 1) to update the statistically derived relationship between export promotion and development spending and U.S. agricultural trade; 2) to evaluate the performance of USDA's export market development programs in terms of their impact on U.S. agricultural exports; 3) to determine if any increases in resulting agricultural exports improve the health of the farm sector, as well as aggregate economic welfare from a cost-benefit perspective in conformance with OMB *Circular A-94*; and 4) to empirically test or verify any market failures and externalities that would justify a federal role in this activity.

From an economic standpoint, the federal role in agricultural market development is justifiable if two conditions are satisfied. Firstly, there should exist a market failure, which leads commodity-specific trade organizations to underinvest in export promotion compared with the socially optimal level. Secondly, there must be a compelling public interest that would justify firms to promote more (Rauch, 1993). Commodity-specific trade organizations will underpromote if promotion results in significant positive externalities—benefits that accrue to the economy, but are not captured by the exporting firms. In this context, we consider three sources of market failure. First, the appropriation of funding that is allocated annually is uncertain. Therefore, firms develop promotion plans for a short-term period (one year). The effects of market development last over many years, though, which program participants do not fully take into account in their decision-making process. Hence, market development activities are underfunded compared with the socially optimal level (Dhalla, 1978). The second positive externality arises when market development for one commodity increases the demand for another commodity. This "halo effect" is not considered by exporters as an incentive in their decision to promote unless the products are marketed under a co-branding program. Therefore, again firms tend to underpromote their own products compared with the socially optimal level (Dwyer, 1995). Third, related to the first two sources of market failure, the less-than-optimal amount of promotion (and hence exports) will lead to less-than-socially-optimal operating levels in other segments of the farm and general economy. Exports may benefit other sectors of the economy in terms of increasing growers' prices, higher tax revenue for the government, reduced government farm-income-support payments, and rents for input suppliers,

which are not taken into account by program participants in their promotion activities. If these extra benefits are felt by the larger farm and macro economy, then there is a compelling public interest in assisting firms to develop new export markets for U.S. agricultural commodities.

To achieve our objectives, we estimated the direct impact of U.S. market development expenditures on the U.S. export market for agricultural commodities. To justify public support of USDA's market development programs, it is not sufficient to show that USDA funds generate positive net benefits. It is necessary to show that the returns would be nonexistent or smaller in the absence of public support. To assess the impact of increased export program funding during the period 2002 through 2009, we simulated "what-if scenarios" to analyze the impact of the increased market development expenditures included in the 2002 Farm Bill and maintained through 2009 on U.S. exports compared with a flat (2001 level) spending scenario. Following this analysis, we ran two forward-looking scenarios to provide potential guidance for future policy debate. The forward-looking scenarios assumed two alternative funding paths, a baseline (status quo) funding level and a 50% decrease in funding taking place in FY2011. The baseline scenario is defined as funding for MAP remaining at $200.0 million and FMD at $34.5 million. Industry contributions were held constant at current levels, also. The 50% spending decrease scenario assumes all export program spending levels are cut in half and industry funds are reduced by the same amount.

The project updated the indirect or "halo" impact of the MAP and FMD programs on commodities that are not promoted but derive benefits from other promoted commodities. Finally, the elasticities of the market development models were combined with a Computable General Equilibrium (CGE) model to analyze the impact that MAP and FMD have on the larger farm economy, as well as on other segments of the general economy. For the CGE analysis, we considered the same two sets of scenarios for analyzing the equilibrium impacts of market development. The first examined the impact of aggregate market development spending (USDA and industry contributions) for both bulk and high-value agricultural commodities. This first set is referred to as the Actual versus Flat (2001) Funding Scenario and the second set is referred to as Alternative Funding Scenarios for the Future. All scenarios were constructed to conform to the requirements of OMB *Circular A-94*.

MAJOR FINDINGS

Measuring the Impacts of USDA's Market Development Programs

The model update phase of the study yielded two important findings: 1) that the link between MAP and FMD spending and U.S. agricultural trade is more significant than previously reported and the future value of current spending is also important; and 2) that the updated model indicates a stronger link between future bulk commodity exports and current spending than was evident in the 2006 study while confirming the relationship for high-value products. By comparing the new versus the old model estimates, bulk agricultural exports are more responsive than previously reported while high-value products are basically unchanged, previously long-run (i.e., longer than three years) promotion elasticity values of 0.199 for high value and 0.144 for bulk, and the newest results are 0.186 for high-value products and 0.192 for bulk commodities.

Consistent with the findings of the 2006 study, our updated trade models indicate that market development expenditures have had a positive and significant impact on U.S. agricultural trade. Separate trade models were developed for bulk and high-value products. Consistent with the 2006 findings, an important difference exists with respect to the lagged impact of market development spending. While both high-value and bulk export categories see benefits well beyond the original year of the investment, high-value agricultural products see returns for more than seven years, while bulk commodities see returns

for about three years. An assessment of the likely halo, or indirect, effect of market development indicates that the effect does occur, it is significant, and can represent a sizable portion of the total promotion and market development effect on agricultural products. While the impact can vary greatly for specific products, its overall effect may be around 47% of the total impact of market development.

While the focus of this research was to quantify the impact of MAP and FMD on U.S. exports, several other factors were taken into consideration and included in the analysis. Factors other than market development included were:

1). Exchange rates to capture the impact of relative prices on U.S. competitiveness

2). A trend variable to account for any structural change in the U.S. market share over time

3). A binary variable to account for the negative impacts of the 2003 and 2006 Bovine Spongiform Encephalopathy (BSE) cases and avian influenza (AI) on U.S. high-value product trade.

It should be noted that the exchange rate has a significant impact on U.S. agricultural trade in both the high-value and bulk sectors, and they are more sensitive (elastic) to changes in exchange rates than market development expenditures. U.S. bulk product exports have been declining over time and this was captured in our trend variable. Finally, a binary variable indicates that U.S. share of high-value trade has been reduced since 2001, due to export disruptions caused by BSE and AI. Figures 1 and 2 show model performance over the estimation period and demonstrate
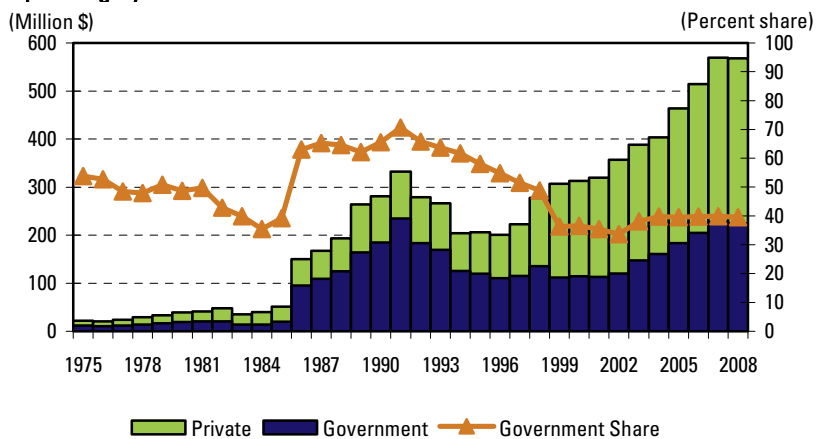
Figure 1: Predicted versus Actual U.S. Share of Foreign High Value Agricultural Product Imports
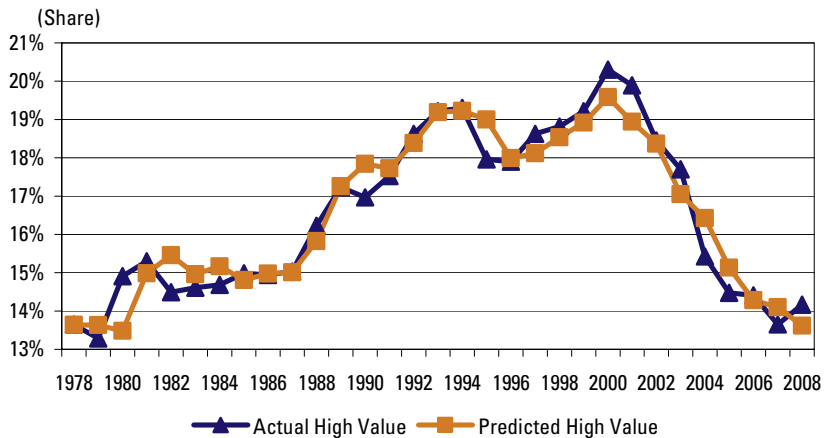
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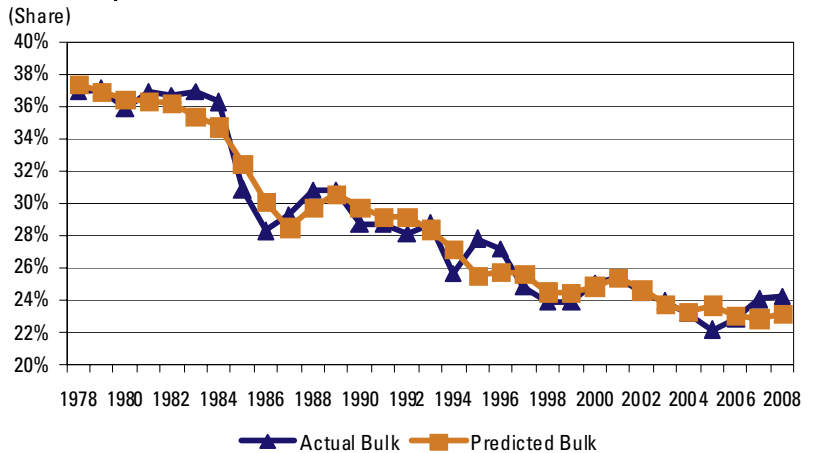
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Impacts Associated With Increased Market Development During 2002 through 2009
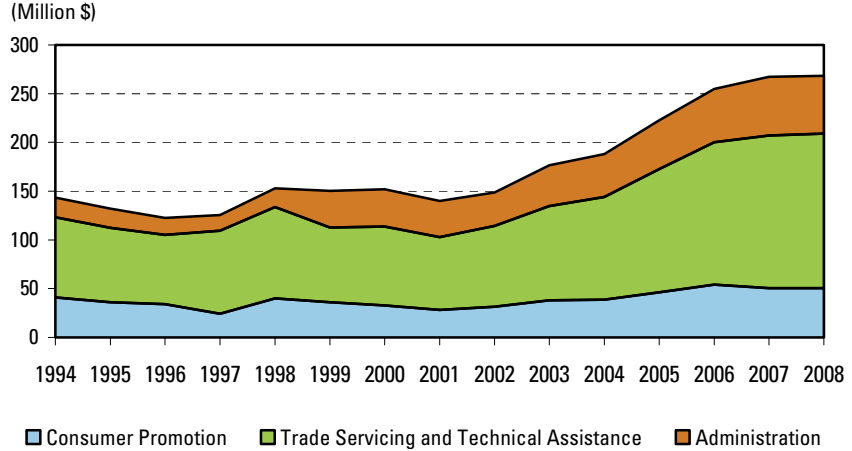
Trade Impacts

Government funding of market development (MAP and FMD) increased significantly under the 2002 Farm Bill from levels under the previous Farm Bill (almost doubling: from roughly $125.0 million in 2001 to $234.5 million). Likewise, cooperator contributions rose significantly, bringing total market development expenditures of the public-private partnership to more than $570 million a year. These increased funding levels have been maintained beyond the expiration of the 2002 Farm Bill through 2009. Notably, technical assistance and trade servicing accounted for most of USDA's market development programs (60%), while consumer promotion accounted for only 20%.
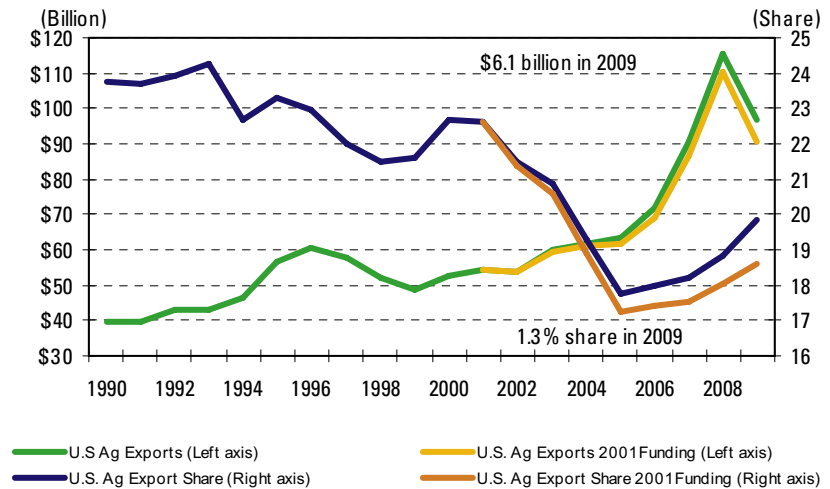
Results from the simulated impact of increased spending during the 2002–09 period indicate that for both bulk and high-value commodities, the increased funding led to increased U.S. agricultural trade and market share.

By 2009, increased market promotion and development spending included is estimated to have increased U.S. export market share from 18.6% to 19.9%, and the value of trade from $90.5 billion to $96.1 billion in nominal terms. Simulating the trade models for both high-value and bulk commodities shows that by 2009, the U.S. share of foreign imports are 1.3 percentage points

their ability to accurately capture U.S. export market share over time.

Figure 4: Breakdown of USDA's Market Development Costs, MAP, and FMD
(Million $)

□ Consumer Promotion   ■ Trade Servicing and Technical Assistance   ■ Administration

Figure 5: Actual U.S. Ag Exports vs. Simulated Exports at Flat (lower) MAP and FMD Spending (2001 levels)

— U.S Ag Exports (Left axis)   — U.S. Ag Exports 2001 Funding (Left axis)
— U.S. Ag Export Share (Right axis)   — U.S. Ag Export Share 2001 Funding (Right axis)

Table 1: Actual vs. Flat (2001) Funding— Economic Welfare Impact

	Impact of Market Development Spending from 2002 through 2009 vs. Flat (lower) Spending Scenario
Total Economic Welfare to Government Expenditure Ratio	14.6:1
Total Economic Welfare to Total Expenditure Ratio (Government and Cooperators)	6.7:1
Total Economic Welfare Gain - U.S. Economy	(+) $1,109 million
Total Economic Welfare Gain - Outside the United States	(+) $2,344 million

Note: Benefits measured as the average annual from 2002 through 2008.

higher and U.S. agricultural exports will be $6.1 billion higher as a result of the increased investment by government and industry during 2002–09. Furthermore, our bulk and high-value models indicate the lagged stimulus provided by market development will be felt for years after the end of the Farm Bill (through 2015 for high-value products and through 2011 for bulk commodities). Account-

Table 2: Actual vs. Flat (2001) Funding—Farm-Level Impact			
	2002–08 Average ($ billion)	Average Percent Change	Level Change ($ billion)
Farm Cash Receipts	248.6	1.76	4.37
Direct Government Payments	15.2	-0.36	-0.05
Net Cash Farm Income	76.4	1.91	1.46
Farm Assets	1713.6	2.01	34.44

ing for this effect and using OMB's discount guidance, the fully discounted multiyear impact of the increase in market development expenditures during 2002–09 (government and industry funds combined) is equal to $35 in agricultural export gains for each dollar expended (discounted benefits are summed from 2002 through 2015).

Impacts on the Farm and Macro Economy

The results of our CGE model indicate a positive impact on the agricultural sector and overall economy. Results from the trade and CGE models are presented in real terms and are discounted over time in an appropriate manner, consistent with OMB *Circular A-94* requirements. The actual spending versus flat spending scenarios for 2002 through 2009 examined past aggregate spending on market development for both bulk and high-value agricultural commodities. Consistent with the requirements of OMB *Circular A-94*, a full employment assumption was maintained for this scenario. Note that all results are expressed as average-per-year changes that occur throughout 2002–09.

On the import side, increased demand for U.S. exports raises internal prices for U.S.-produced bulk and high-value agricultural products, causing some substitution to imported products of these aggregate commodities. Similarly, increased income from higher prices causes expansion of demand for all goods, including imported agricultural products.

U.S. net economic welfare increases $1.1 billion for the entire economy. This welfare increase represents roughly a 14.6:1 ratio of economic benefits to government expenditures and a 6.7:1 ratio of economic benefits to aggregate promotion (government and program participant) expenditures. These results are driven by gains in the terms of trade that occur when demand for U.S.-sourced agricultural products increases in the rest of the world and increases the U.S. export price. The increased competition caused by U.S. agricultural goods in foreign markets results in lower food costs to foreign consumers and a rest-of-world improvement in economic welfare of $2.3 billion.

Under the OMB *A-94* guidelines, employment is constrained to be at full employment, meaning, in an aggregate sense (total economy), there are no new jobs created in the United States that are associated with the increase in U.S. agricultural exports from market development.

Producer prices for bulk and high-value agriculture products increased, causing annual direct government payments to fall 0.36% (equal to $54 million). In effect, the government spending for domestic supports (loan deficiency payments—LDPs—and countercyclical payments) fell about $0.30 for every $1 spent on MAP and FMD. Given the significant increase in the level of commodity prices since the 2006 study, the impact of export program spending on government income-support payments to U.S. farmers is lower in the current analysis.

"Halo" or Indirect Promotion Impact

To estimate the percentage increase in U.S. exports due to halo effects, several factors are considered. First, we assume the impact on total U.S. exports as a result of MAP and FMD is composed of two elements: 1) the impact of the promoted commodities on total U.S. exports; and 2) the impact of the nonpromoted commodities that benefit indirectly from the promoted commodities and contribute to increases in total U.S. exports. Next, we assume that nonpromoted commodities may be of two types. The first are commodities that are promoted in major markets but not promoted in other minor markets. For example, U.S. corn may be promoted in some major markets where the demand is high, but not promoted in other markets where the demand for U.S. corn is relatively lower but the demand for U.S. soybeans is high and, therefore, soybeans are heavily promoted. In this case, exports of U.S. corn may benefit from the promotion of U.S. soybeans. The second type is specialized commodities that encompass a small share of U.S. exports and are not promoted. Such commodities may benefit from other U.S. commodities that are heavily promoted. Because the market share of U.S. commodities that are not promoted is uncertain, we consider a range of possible values when estimating the percentage of halo effect that represents the total impacts on U.S. trade.

To derive an estimate for the halo impact on agricultural trade, we relied on trade promotion elasticity estimates developed in this report as well as estimates found in our review of relevant literature. One of the significant factors that is needed to calculate a point estimate for the halo effect is the specific share of all products that see some type of direct market development activity, or conversely, the portion of the market that sees no direct promotion for an individual product. Assuming that 80% of the markets for 80% of the products (trade weighted) see some type of direct market promotion, this result would imply that 64% of the total market sees direct promotion. Using 64% as a midpoint estimate, the data in figure 4 shows the portion of total promotion effect attributed with the halo effect would be 47% and the sensitivity around the 64% assumption indicates a halo impact of 32–62% of total promotion. The sizable increase in the halo estimate in the current study is driven by the higher trade share elasticity to promotion for bulk commodities. This result is consistent with the theory that underpromoted or nonpromoted commodities benefit from increased promotion of other commodities in the same market. It is expected that the halo impact for specific sets of products can vary greatly. Most often, exporters do not consider these spillover benefits to other products and, therefore, underpromote: a reflection of the second market failure.

Figure 6: Percentage of U.S. Export Market Share Change Attributed to the Halo Effect

(Halo share of total promotion)

Total promotion elasticity = 0.127
Direct promotion elasticity = 0.106
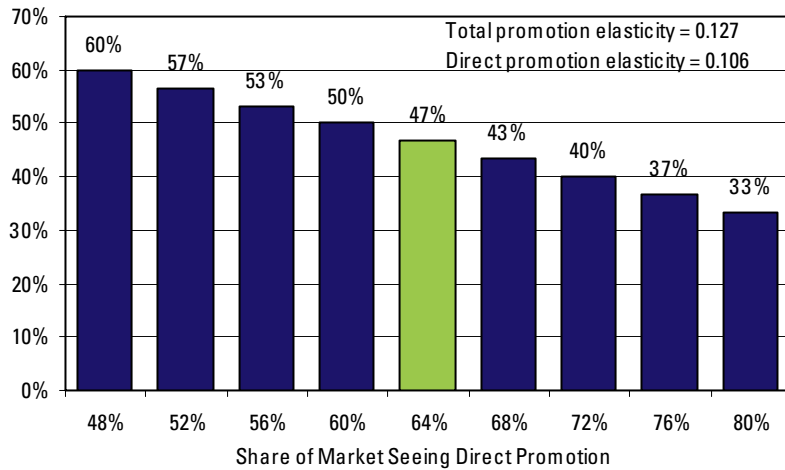
Share of Market Seeing Direct Promotion

Impacts of Alternative Funding Scenarios for the Future

Trade Impacts

To analyze the trade impact of alternative funding scenarios, two forward-looking scenarios were developed. The "base scenario" assumed a flat spending path from FY2011 through the projection period of

2030. The alternative spending scenario cut total spending, government and cooperator, by 50% or $280 million.

The base scenario shows slow growth in the U.S. share of rest-of-world (ROW) imports in agricultural goods. The share moves from roughly 20.0% in 2009 to 20.5% in 2018. Assumptions about market development and spending are held constant during the entire projection period. We assume the negative trade impact of BSE and AI will be insignificant by 2014, and this assumption is maintained for both scenarios. This assumption is responsible for much of the share gain in the base case, but again the assumption is held constant across all scenarios and does not impact the difference between scenarios. The base-case results were scaled to follow the February 2010 USDA baseline, which projects total U.S. agricultural exports of $116.6 billion in 2018. In the decreased spending scenario (-$280 million), the U.S. share of ROW imports declines nearly 1 percentage point, which translates into a reduction of $8.9 billion in exports from the base case.

Impacts on the Farm and Macro Economy

The impact of a 50% cut in export program spending by both the government and industry is sizable. Using USDA's February 2010 farm sector projections as a baseline, farm cash receipts would average $5.92 billion lower or 1.8% lower during 2012–18, and net cash in-

Figure 7: Simulated Ag Export Impacts of Alternative MAP and FMD Funding Scenarios for the Future

(Billion)
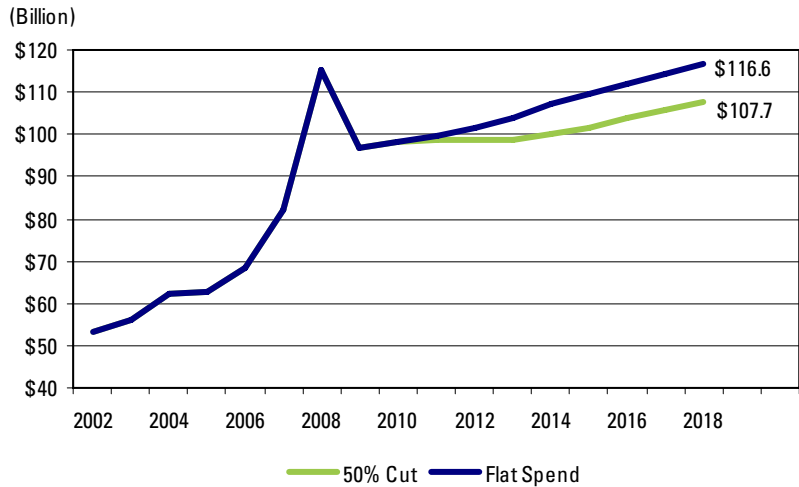
50% Cut — Flat Spend

Table 3: Alternative Future Funding Scenario—Economic Welfare

	50% Cut in MAP/FMD vs. Flat Spending Starting in 2011
Total Economic Welfare to Government Expenditure Ratio	13.5:1
Total Economic Welfare to Total Expenditure Ratio (Government and Cooperators)	5.7:1
Total Economic Welfare Loss - U.S. Economy	(-) $1,089 million
Total Economic Welfare Loss - Outside the United States	(-) $2,097 million

Note: Average change and levels during the 2012-18 period.

Table 4: Alternative Future Funding Scenario—Farm-Level Impact

	2012–18 Average ($ billion)	Average Percent Change	Level Change ($ billion)
Farm Cash Receipts	316.4	-1.87	-5.92
Direct Government Payments	9.2	0.60	0.06
Net Cash Farm Income	77.9	-2.55	-1.99
Farm Assets	2023.1	-2.18	-44.10

Note: Average change and levels during the 2012-18 period.

come would drop $2.0 billion or 2.6%. Reduced income and overall farm activity would cause farm assets to decline in value by $44 billion or 2.2% and direct government payments for farm income support would increase $60 million because of lower commodity prices. All measures are reported as the average annual change during 2012–18.

The net economic losses to the total U.S. economy from reduced market promotion would average $1.1 billion annually from 2012 through 2018. A loss in economic welfare results from the decreases in agricultural factor prices and land rents. The loss in economic benefits from cutting the program is around 13.5 times greater than the savings taxpayers would see from not having to fund the program and about 5.7 times greater than the combined cost reduction to taxpayers and cooperators. Consumers abroad would see an average annual $2.1-billion loss in economic welfare due to marginally higher food cost. Again, all changes refer to the period 2012–18 and are reported as annual average changes.

MARKET FAILURES

The empirical results from this study verify the market failures—stemming from positive externalities—discussed earlier. These market failures and the corresponding results are as follows:

i) **Uncertain Funding.** We have found that market development has a lagged impact on both product sectors, but the lags are over twice as long for high-value commodity trade (seven years) as for bulk commodities (three years). This finding implies that efforts to promote high-value commodities receive benefits over a longer period. The implication that market development has a lagged impact on both bulk and high-value product sectors is consistent with the first market failure. Because exporters are inclined to see future benefit streams as risky and uncertain, the benefits to society over the long run can be greater than those to individual exporters.

ii) **Halo Effects.** The second market failure arises from the indirect or "halo" effects of export promotion. A particular organization may undertake market development activities targeted at a specific commodity or group of commodities, but these activities can have spillover or beneficial effects, enhancing U.S. exports of other agricultural products. In instances where the spillover effect is positive, a halo effect is said to exist. The results of our halo model indicate that export market development has positive "halo effects," potentially as much as 47%; however, exporters do not consider these benefits to other products and therefore provide insufficient resources for market development: a reflection of the second market failure. The addition of trade data for the years 2006 through 2008 to the analysis implies that the halo impact is larger than originally estimated in 2006. In 2006, the halo impact was estimated to be 39%.

iii) **Benefits to Other Segments of the Farm Economy.** Finally, the third market failure stems from increased exports that may benefit other sectors of the farm and general economy, but are not taken into account by exporters in their promotion activities. Results from our CGE model indicate, for the Actual versus Flat (lower) Spending 2002 through 2009 scenario, that aggregate U.S. farm assets and farm cash receipts increase an average of $34.44 billion and $4.37 billion, respectively. The increase in trade amounts to a $1.46-billion improvement in net farm income. The above-reported findings are expressed as average annual change during 2002–08.

CONCLUSIONS AND POLICY IMPLICATIONS

The USDA's market development programs (MAP and FMD) were initiated with an objective to foster the creation, expansion, and maintenance of foreign markets for U.S. agricultural products. Nevertheless, to justify current and future public support for these programs, it is necessary to thoroughly analyze the impact of these programs on U.S. agricultural exports, as well as the downstream effects any increase in exports has on the macroeconomy. To do so, the objective of this study was to measure the collective effects of the MAP and FMD programs at the aggregate level on U.S. bulk and high-value agricultural exports, to measure the programs' farm sector impacts and net macroeconomic benefits, and to empirically verify market failures that would justify the federal role in agricultural export promotion activities.

A comparison between our updated trade models and those developed in 2006 indicates that the relationship between MAP and FMD spending and U.S. agricultural trade has strengthened in the years between these updates. The increases are seen in the higher trade response (elasticities) as well as increased statistical confidence in the models. Statistical confidence surrounding the lagged impact of promotion spending has also increased since the last study.

The simulation output from our trade models indicates that the market development partnership between government and industry has had significant influence on U.S. exports. Overall, U.S. agricultural exports have increased $35 for every additional market development dollar expended by government and industry (measured by the discounted streams of benefits and cost from 2002 through 2015). This measure captures the difference due to increased MAP, FMD, and cooperator spending during 2002 through 2009, basically the increase included in the 2002 Farm Bill and subsequently maintained through 2009. Likewise, the findings from the CGE model indicate positive impacts on cash receipts, farm income, farm asset values, and reduced government spending on domestic support payments. Furthermore, the country has experienced net economic welfare gains of $1.1 billion annually (average 2002 through 2008) from increased market development activity.

From the standpoint of whether government involvement in market development is justified, we have empirically verified three types of market failure. We have estimated that the effect of a market development dollar spent in a given year lasts over several years—that is, three years for bulk commodities and seven years for high-value commodities (uncertain funding). The results from our halo model indicate that export market development has net positive impacts on other U.S. commodities, accounting for roughly 47% of total program impacts.

In terms of impacts on other segments of the farm economy, the results of our CGE model yield improved net farm income, cash receipts, and farm assets—all without any reduction in the economic welfare of other sectors of the economy. Net economic benefit gains in our analysis arise from increased U.S. export prices relative to import prices.

At the farm level, we see significantly higher land values that expand farmer wealth, as well as increased returns to farm-used labor and capital—also raising farm wealth because most primary factors employed on farms are owned by farm operators. This outcome is a particularly important in the context of World Trade Organization (WTO) negotiations that are focused on reducing domestic supports. Under the WTO, USDA's MAP and FMD programs are not considered to be market distorting and, therefore, provide a potential means of supporting domestic agriculture while remaining WTO compliant.

In the final analysis, it can be said that MAP and FMD programs provide a basis for coordinated U.S. market development efforts that would otherwise be fragmented or nonexistent. Nevertheless, despite the sharp increase in government financing of the MAP and FMD programs since 2001, contributions from industry have increased significantly as well and now represent the majority of total export

market development funds. Another point to note is that approximately two-thirds of MAP and FMD funds are used for technical assistance and trade servicing, including trade policy support activities. (These activities would not normally be financed and undertaken by the private sector.) Only 20% is used for consumer promotions, which is contrary to widespread belief by program critics that market development (and MAP in particular) is synonymous with advertising.

The analysis, modeling procedures, and results we have presented have rigorously conformed to the full employment, discount rate, price inflation, and sensitivity analysis requirements of OMB *Circular A-94*.

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