Economic and Nutritional Implications from Changes in U.S. Agricultural Promotional Efforts

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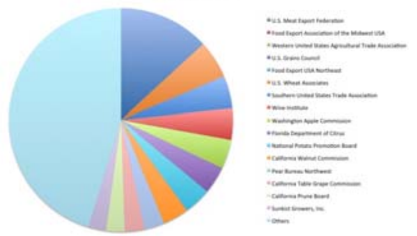
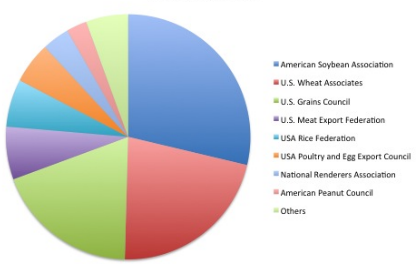
Introduction

The U.S. government has had a long tradition of subsidizing promotional efforts for agricultural products in export markets through research, trade shows, or advertising campaigns. Public funds are purportedly used for promotion to raise the market share of U.S. agricultural products in an increasingly competitive international marketplace. Since 2002, the Market Access Program (MAP) has served as the main program supporting promotion for high-value agricultural products (e.g., fruits, salmon, almonds, and wine) in foreign markets. The Foreign Market Development (FMD) program has also provided promotion funds to expand long-term export markets for bulk products (e.g., soybean, cotton, grains, meat, wheat, and rice);.

MAP Allocations



FMD Allocation



Key References

Kinnucan, H.W., Cai, H., 2011. A benefit-cost analysis of U.S. agricultural trade promotion. *American Journal of Agricultural Economics* 93 (1), 194–208.

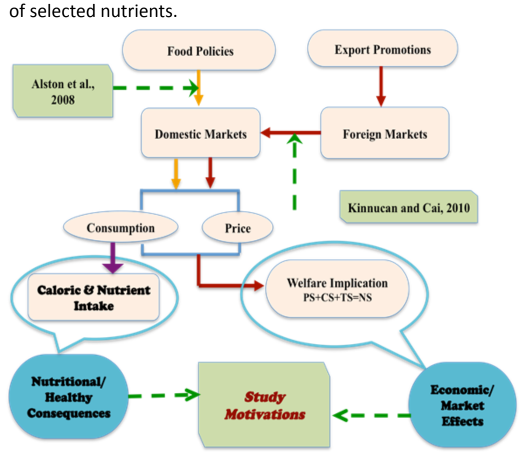
Alston, J.M., Mullally, C.C., Sumner, D.A., Townsend, M., Vosti, S.A., 2009. Likely effects on obesity from proposed changes to the U.S. food stamp program. *Food Policy* 34 (2), 176–184.

Research Question

This poster examines the linkage between agricultural subsidies applied to export promotions and the implications for domestic welfare and the associated domestic nutritional outcomes. We examine the economic and nutritional impacts from a redirection of export promotion expenditures towards domestic promotion efforts for horticultural commodities. First, we simulate the economic impacts of changes in government expenditures for export promotions of two commodity categories: horticultural products and non-horticultural products. Second, we use the simulated economic changes to calculate the corresponding changes in caloric consumption and intake of key nutrients, and discuss the implications.

Framework & Model

We develop a multi-market partial-equilibrium model to simulate the effects of reductions in export promotion subsidies. The model is a system of supply, demand, and market clearing conditions for two commodity groups. Solutions to the logarithmic transformation hinge on the parameters that describe supply, demand and promotional elasticities as well as various quantity and promotional shares. The results from the simulation model are subsequently used to calculate changes in welfare, caloric consumption and intake of selected nutrients.



Results & Policy Implications

Table 2. Economic and Nutritional Effects from a 10% Decrease in Government Expenditures for Agricultural Export Promotions

Parameters		Decrease in export promotions for horticultural and non-horticultural products				Decrease in export promotions for horticultural products only			
Domestic response to advertising		No Response	Minor Response[a]	Modest Response[b]	Major Response[c]	No Response	Minor Response[a]	Modest Response[b]	Major Response[c]
Change in price (%)	Horticultural	-0.98	-0.95	-0.82	-0.65	-2.30	-2.22	-1.92	-1.52
	Non-horticultural	-0.30	-0.25	-0.03	0.26	0	0	0	0
Change in quantity (%)	Horticultural	0.69	0.95	2.01	3.34	1.66	2.26	4.71	7.81
	Non-horticultural	0.14	0.23	0.56	0.99	-0.12	-0.11	-0.10	-0.08
Change in producer surplus (million $)	Horticultural	-241	-233	-201	-160	-563	-544	-469	-374
	Non-horticultural	-506	-417	-51	435	0	0	0	0
Change in consumer surplus (million $)	Horticultural	123	171	363	609	291	400	844	1421
	Non-horticultural	363	553	1325	2316	0	87	437	880
Change in social surplus[d] (million $)	Horticultural	-118	-62	162	449	-272	-144	375	1047
	Non-horticultural	-143	136	1274	2751	0	87	437	880
Change in annual caloric consumption per capita (calories)	Horticultural	539	742	1570	2609	1297	1765	3679	6100
	Non-horticultural	947	1556	3788	6696	-812	-744	-676	-541
Change in annual intake of selected macronutrients and micronutrients per capita	Cholesterol (mg)	186.5	306.3	745.9	1318.6	-159.8	-146.5	-133.2	-106.6
	Fiber (g)	18.9	26.8	58.5	98.7	34.6	48.4	103.9	174.3
	Vitamin A (μg)	593.0	870.5	1948.4	3324.0	763.0	1116.3	2514.2	4293.7
	Vitamin C (mg)	135.0	186.7	396.8	660.7	314.0	428.7	896.5	1488.6
	Calcium (mg)	384.8	587.8	1358.1	2349.4	213.5	373.9	980.8	1760.1
	Iron (mg)	10.8	16.2	36.8	63.3	9.7	15.1	36.1	62.9

[a] Domestic promotional elasticity assumed as $\alpha_d^h = \alpha_d^n = 0.01$. [b] We set $\alpha_d^h = \alpha_d^n = 0.05$. [c] We set $\alpha_d^h = \alpha_d^n = 0.10$. [d] Here we assume that $\Delta TS^h = \Delta TS^n = 0$.

Depending on the level of consumer response to domestic advertising, caloric consumption increases by between 1486 and 9305 calories annually, and annual intake of all the selected nutrients increases. When we simulate a 10% decrease in export promotion for horticultural commodities only (thereby diverting the funds to domestic promotion for horticultural commodities) we see larger welfare effects in horticultural markets, but smaller welfare effects overall.

Our results indicate that this redirection of promotion expenditures would increase net social welfare (largely from increases in consumer surplus due to lower prices). When we focus on changes in promotional efforts for horticultural commodities, the net gain in social surplus for horticultural commodities increases as the level of substitution between the commodity categories increases, and it increases notably as the advertising effectiveness for domestic horticultural promotion increases.

Table 3. Additional Simulation Results for a 10% Decrease in Government Expenditures for Horticultural Export Promotions

Parameters		More consumer trust in government-sponsored promotion for horticultural commodities			Stronger substitution effect between horticultural and non-horticultural products[a]		
Domestic response to advertising		Minor Response[b]	Modest Response[c]	Major Response[d]	Minor Response[e]	Modest Response[f]	Major Response[g]
Change in price (%)	Horticultural	-2.15	-1.52	-0.71	-2.24	-1.93	-1.53
	Non-horticultural	0	0	0	0	0	0
Change in quantity (%)	Horticultural	2.87	7.81	14.13	2.27	4.72	7.81
	Non-horticultural	-0.11	-0.08	-0.04	-0.56	-0.48	-0.38
Change in producer surplus (million $)	Horticultural	-526	-374	-174	-547	-472	-376
	Non-horticultural	0	0	0	0	0	0
Change in consumer surplus (million $)	Horticultural	509	1421	2652	419	935	1606
	Non-horticultural	174	880	1787	499	2509	5057
Change in social surplus[h] (million $)	Horticultural	-17	1047	2478	-128	463	1230
	Non-horticultural	174	880	1787	499	2509	5057
Change in annual caloric consumption per capita (calories)	Horticultural	2242	6100	11037	1773	3687	6100
	Non-horticultural	-744	-541	-271	-3788	-3246	-2570
Change in annual intake of selected macronutrients and micronutrients per capita	Cholesterol (mg)	-146.5	-106.6	-53.3	-745.9	-639.3	-506.1
	Fiber (g)	62.1	174.3	317.8	38.0	95.2	167.2
	Vitamin A (μg)	1460.8	4293.7	7920.4	468.3	1967.9	3857.9
	Vitamin C (mg)	545.1	1488.6	2695.7	420.0	889.5	1481.5
	Calcium (mg)	521.1	1760.1	3347.6	-325.2	390.8	1292.4
	Iron (mg)	20.2	62.9	117.5	-0.8	22.7	52.2

[a] Elasticity of substitution is set at 0.25 ($\eta_d^{hn} = \eta_d^{nh} = 0.25$). [b] Domestic promotional elasticity assumed to be $\alpha_d^h = 0.02$, $\alpha_d^n = 0.01$. [c] We set $\alpha_d^h = 0.1$, $\alpha_d^n = 0.05$. [d] We set $\alpha_d^h = 0.20$, $\alpha_d^n = 0.10$. [e] We set $\alpha_d^h = \alpha_d^n = 0.01$. [f] We set $\alpha_d^h = \alpha_d^n = 0.05$. [g] We set $\alpha_d^h = \alpha_d^n = 0.10$. [h] Here we assume that $\Delta TS^h = \Delta TS^n = 0$.