Regional Economic Impacts of the 1996 U.S. Peanut Program

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Abstract

Major changes in the 1996 U.S. peanut program include reducing the quota support price, lowering quota level, and eliminating the price escalator and undermarketings provisions. Economic impacts of the program were profound and different across production regions. Farm income reduction and its regional differences present the industry with serious challenges.

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The year long debate and discussion on the U.S. peanut program were concluded as the President signed the farm bill known as the Federal Agriculture Improvement and Reform (FAIR) Act of 1996. The seven-year long new program reduced the quota support price, lowered quota level, abolished the price escalator, and eliminated undermarketings carryover. Temporary quotas (of seed) were also granted to all peanut producers. U.S. Department of Agriculture (USDA) further adjusted basic quotas based on projected domestic demand for edible peanuts. Changes in the domestic peanut program accompanied by free trade and reduced trade barriers agreements are reshaping the U.S. peanut industry.

Since peanut production is highly concentrated in some southern states, there is a growing concern about how the new program affects regional rural economies. Of the national peanut production, about 62% are produced in the Southeast, 14% in North Carolina-Virginia, and 22% in the Southwest in the 1992-94 period (USDA). More importantly, total quota for each production region is not only determined by basic quota but also by temporary quota for seed, which is related to seeding rate for each type of peanut produced. Runner peanuts primarily grown in the Southeast accounted for about 74% of the U.S. peanut production. Virginia peanuts, grown in the Virginia-North Carolina region accounted for about 18%. Spanish and Valencia grown in the Southwest accounted for about 8% of national production. While the bulk of literature (Borges; Carley and Fletcher; Earley; Fleming and White; Nieuwoudt et al.; Rucker and Thurman;

Song et al.; U.S. General Accounting Office) was developed to analyze various issues related to previous peanut programs, no studies have addressed regional economic issues created by the new peanut program. An understanding of regional economic implications due to the new program helps policy makers and peanut leaders enhance the feasibility of the program. The objectives of this study are to analyze the new peanut program and estimate regional economic impacts brought by the program on peanut growers, government expenditures, and peanut consumers.

Analytical Framework

While the U.S. peanut program is complicated in terms of its enormous provisions and regulations, the essence of the program is simple--to control supply of quota peanuts and meet demand for edible peanuts in the domestic food market. The feature of a supply management program determines that the supply for quota peanuts (i.e., edible peanuts) is a single point, B, in the demand and supply framework (Figure 1). Having the support price fixed at P_{s0}, USDA sets the quota level at Q_0. Peanut growers may produce more peanuts than their quota, but they cannot sell more than their quota as edible peanuts in the domestic market.

The demand for peanuts consists of the demand for edibles and additionals. A hypothetical aggregate demand for edible peanuts in the domestic food market under the previous program is given by D_0D_0 (Figure 1). Estimated demand for edible peanuts by USDA under the previous program is assumed at Q_0 with a support price at P_{s0}. Since peanut production for export and crushing is not subject to government supply control, the aggregate farm-level demand for additionals is denoted by P_aD_t. A combined demand

for additionals is assumed to be perfectly price elastic because the demand for exports is a small component of the world total oilseed complex (Helmberger). Furthermore, all additional/unused edible peanuts must be crushed. Consequently, aggregate demand for quota and additional peanuts under the previous program can be represented by a kinked demand curve, D_0D_t (Figure 1).

In the recent years the previous demand schedule for edibles, D_0D_0, however, shifted to the new demand schedule, D_1D_1, due to consumers' preference away from foods seen as high in fat. This is evidenced by the continuous decline in peanut food use in the domestic market since the 1989/90 peak. Since the previous program fixed quota poundage at Q_0, which failed to adjust the shrinkage of edible demand, there was a surplus for edible peanuts, Q_0 - Q_2 (Figure 1). The new peanut program reduced the support price for edible peanuts from P_{s0} to P_{s1} and USDA reduced quota by Q_0 - Q_1 to clean up the anticipated surplus of edible peanuts in the market.

Changes in support price and quota poundage in the peanut program would affect the peanut growers, government expenditures, and peanut consumers. A reduction of support price from P_{s0} to P_{s1} would decrease farm income for quota peanut producers by $P_{s0}AG\ P_{s1}$, *ceteris paribus* (Figure 1). A reduction of quota poundage from Q_0 to Q_1 would reduce farm income for quota producers by ABQ_0Q_1, holding other things constant. If quota peanut growers produce more additionals to replace quota reduced, farm income reduced due to quota cut would be ABCF (Figure 1) because they could still sell additionals (Q_0 - Q_1) at P_a. Since peanut program benefits under the previous program were from both consumers and government expenditures, farm income reduction for quota

growers are gains for consumers and taxpayers. Changes in the peanut program would result in an income transfer back to consumers by the area of $P_{s0}HGP_{s1}$, which is part of the income transferred from consumers to quota producers under previous programs. Part of the farm income reduction in quota peanut production (i.e., area ABCF in Figure 1) were savings for government expenditures or taxpayers.

Since the seven-year program fixed the support price at $610/ton for quota peanuts, economic impacts of the new program would depend on domestic demand for American produced quota peanuts and imports of edible peanuts. Minimum import access levels under GATT and NAFTA are also fixed and presumably fully imported given the price difference between domestic produced edible and imported edible peanuts. Consequently, long term economic impacts of domestic policy reform on regional economies were mainly determined by changes in the domestic demand for American quota peanuts.

Methods and Procedures

To estimate regional economic impacts of the peanut program, three components of the analytical framework must be obtained: demand function for edible peanuts, total quota in each region for each crop year, and market price of all additional peanuts. The demand function was specified as:[1]

$$Q_i = \beta_0 + \beta_1 P_i + \beta_2 I_i + \beta_3 S_i + \_i \qquad (1)$$

where Q is quantity of demand for edible peanuts (farmer stock peanuts, 1,000 lbs.); P is real FOB price for edible peanuts (¢/lb.) (base year: 1982-84=100);[2] I denotes real disposable income for the nation (million dollars); S is real price of a peanut substitute,

almond, for edible peanuts (¢/lb.), and _ is the random error. Quantity of demand and price for edible peanuts were collected from *Peanut Market Summary* (USDA). Disposable income was collected from *Statistical Abstract of the United States*. The price of almond was collected from *Agricultural Statistics*. The model was estimated by OLS and summarized in Table 1. The Cochrane-Orcutt procedure was used to correct the autocorrelated errors (Shazam). All coefficient estimates are as theoretically hypothesized.

Total quota was estimated for Virginia-North Carolina, Southeast, and Southwest for the 1996 crop year, respectively. While the Southeast consists of Alabama, Florida, and Georgia, the Southwest includes Oklahoma and Texas. Given basic quota poundage released by USDA, expected production of additionals in the 1996 crop year was estimated using the relationship of quota and additional peanuts for 1992-94. Since peanuts were distinguished by type, peanut production including basic quota and additionals was further decomposed into Runner, Virginia, Valencia, and Spanish according to the production distribution of each type of peanut in the previous three years. Planted acreage equals total peanut production divided by average yield per acre. Temporary quotas for seed are dependent on planted acreage and seed rate released by USDA for each type of peanut, respectively.

The price of additional peanuts, P_a, is the weighted average price of export and crushed peanuts in the CCC pool and contracted additionals through the commercial channel. Based on the information for the 1992-1994 period, the derived weighted average price for additional peanuts was $349.80 per ton (USDA).

For a long term economic impacts, there would be no cost to the government from excessive quota production because peanut grower associations would use pool profits and market assessments (if necessary) to cover the costs about quota peanuts crushed. Domestic demand of American produced peanuts for the next four years were assumed at three levels: constant, increase by 2% annually, and decrease by 2% annually.

Results

Economic impacts of the new peanut program on the regional economies were estimated and are summarized in Tables 2 and 3. Economic implications associated with the program reform differed from region to region. The new peanut program would lead to total quota declined about 260 million pounds for the Southeast, 100 million pounds for Virginia-North Carolina region, and 202 million pounds for the Southwest between 1996 and 1995. Because of the program, total farm income would decline by $136 million or about 24% in the Southeast between the two crop years (Table 2). Of the 24% farm income reduction, about 8% was due to price reduction and 16% was attributed to quota reduction. For Virginia-North Carolina region, total farm income would decrease by $49 million or 26%, in which 8% of the farm income reduction was related to price reduction and 18% was associated with quota reduction. In the Southwestern region, total farm income would drop about $85 million or 37%, in which 7% of the reduction was attributed to support price reduction and 30% was due to quota poundage reduction. Economic impacts were most significant in the Southeast in terms of farm income reduction since the Southeast is the largest peanut production region in the U.S. The reduction rate of farm income was the largest in the Southwest (37%) in terms of

percentage change because of its large undermarketings in the previous years.

If quota peanut growers produce additionals to meet quota reduced, total gross farm income would decrease by $91 million for the Southeast, $32 million for Virginia-North Carolina region, and $50 million for the Southwestern region due to domestic policy reform. Economic impacts of the new program were still most significant to the Southeast. Because of quota poundage reduction associated with the new peanut program, savings for government expenditures would be about $43 million in the Southeast, $16 million in Virginia-North Carolina, and $33 million in the Southwest. Farm income transferred back to consumers due to the new program would approximate $47 million from the Southeastern region, $15 million from the Virginia-North Carolina region, and $16 million from the Southwestern region.

Long term economic impacts of the new program combined with increasing imports brought by General Agreement on Tariffs and Trade (GATT) on the peanut industry are summarized in Table 3 for next four years. If there was no change in domestic demand for domestic edible peanuts (Scenario 1), increasing imports would reduce farm income by $12 million for the Southeast, $4 million for Virginia-North Carolina region, and $4 million for the Southwest. If domestic demand for American produced edible peanuts increased by 2% annually, farm income for peanut producers would increase by $35 million in the Southeast, $11 million in Virginia-North Carolina, and $12 million for the Southwest. However, farm income would decline about $34 million in the Southeast, $11 million for Virginia-North Carolina, and $11 million in the Southeast if domestic demand for American produced peanuts declined by 2% annually.

Summary and Conclusions

Both short and long term economic impacts of the new peanut program were different from region to region. Economic effects brought by domestic policy reform were most notable in the Southeast and least notable in the Virginia-North Carolina in terms of farm gross income reduction between the 1996 and 1995 crops. However, the reduction rate of farm income was highest for the Southwest because of its large undermarketings in the previous program. If domestic demand for American produced edible peanuts declined continuously as in the previous several years, the new peanut program combined with GATT would induce a substantial reduction in farm income for the rest of this century.

Drastic decline in farm income brought by the new program raises concerns about quota peanut producers' survival in those area where peanut production is highly concentrated such as the Southeast. Decreased peanut production would probably further affect peanut shelling and manufacturing processors. Domestic policy reform for peanuts may even change crop production patterns in those peanut producing areas. A contraction of economic activities in rural communities may be inevitable. It would be also challenging for peanut growers to adjust their production and marketing methods to the meet the changing domestic program.

Endnotes

1. This study assumes that there is no difference in demand for edible peanuts between national and regional levels due to data constraint for individual regions.

2. The formula used to convert shelled peanuts to farmer stock peanuts is $Q_{FST} = Q_{shelled} * (1/R_{shelling})*(1/R_{culling})$, where Q_{FST} represents farmer stock peanuts (lbs.), $Q_{shelled}$ represents shelled peanuts (lbs.), $R_{shelling}$ is shelling rate (75%), and $R_{culling}$ is culling rate (88%). The formula used to convert the price of shelled peanuts to the price of farmer stock peanuts is $P_{FST} = P_{shelled} * R_{shelling} * R_{culling} - C_{shelling}$, where P_{FST} denotes the price of farmer stock peanuts (¢/lbs.), $P_{shelled}$ denotes the price of shelled peanuts (¢/lbs.), and $C_{shelling}$ denotes shelling cost (¢9.98/lb.).

Table 1. Estimated Domestic Demand Function for Edible Peanuts (1965-94).

Indep. Variable	Estimated Coef.	*t*-ratio	Elasticity at Means
Intercept	1,081,800.00	3.722*	0.515
P (Edible Peanut Price)	-5,170.20	-7.158*	-0.144
I (Income)	0.47	4.202*	0.541
S (Almond price)	963.70	2.932*	0.061
R-square = 0.95			

* indicates the significance at P≤ 0.01.

Table 2. Estimated Economic Impacts of the New Peanut Program across Regions between the 1996 and 1995 Crop Years.

Item	Unit	Southeast 1995	Southeast 1996 Proj.	Southeast Differ.	Virginia-North Carolina 1995	Virginia-North Carolina 1996 Proj.	Virginia-North Carolina Differ.	Southwest 1995	Southwest 1996 Proj.	Southwest Differ.
		----------1,000----------								
Quota[a]	lbs	1,589,101	1,294,823	-294,278	510,777	416,189	-94,588	553,603	434,788	-99,815
Effective Quota[b]	lbs	1,670,455			544,732			683,104		
Additionals	lbs		632,262			106,794		220,003		
Planted Acreage	acre	898	801	-97	244	235	-9	375	307	-68
Temporary Quota for Seed	lbs		115,710			28,234			45,967	
Planted Acreage for Seed Quota	acre		48			13			23	
Total Quota	lbs	1,670,455	1,410,534	-259,921	544,732	444,422	-100,310	683,104	480,755	-202,349
Total Planted Acreage	acre	898	849	-49	244	248	4			-45
Gross Income with No Add. Planted[c]	dol	566,284	430,213	-136,072	184,664	135,549	-49,115			-84,942
(1) Due to Price Reduction[d]	dol			-47,958			-15,110			-16,346
(2) Due to Quota Reduction[e]	dol			-88,113			-34,005			-68,596
Gross Income with Add. Planted[f]	dol			-90,611			-31,571			-49,551
(1) Gross Income from Add.[g]	dol			-45,460			-17,544			-35,391
Government Expenditures[h]	dol			-42,653			-16,461			-33,205
Income Transfer to Consumers[i]	dol			-47,014			-14,813			-16,024

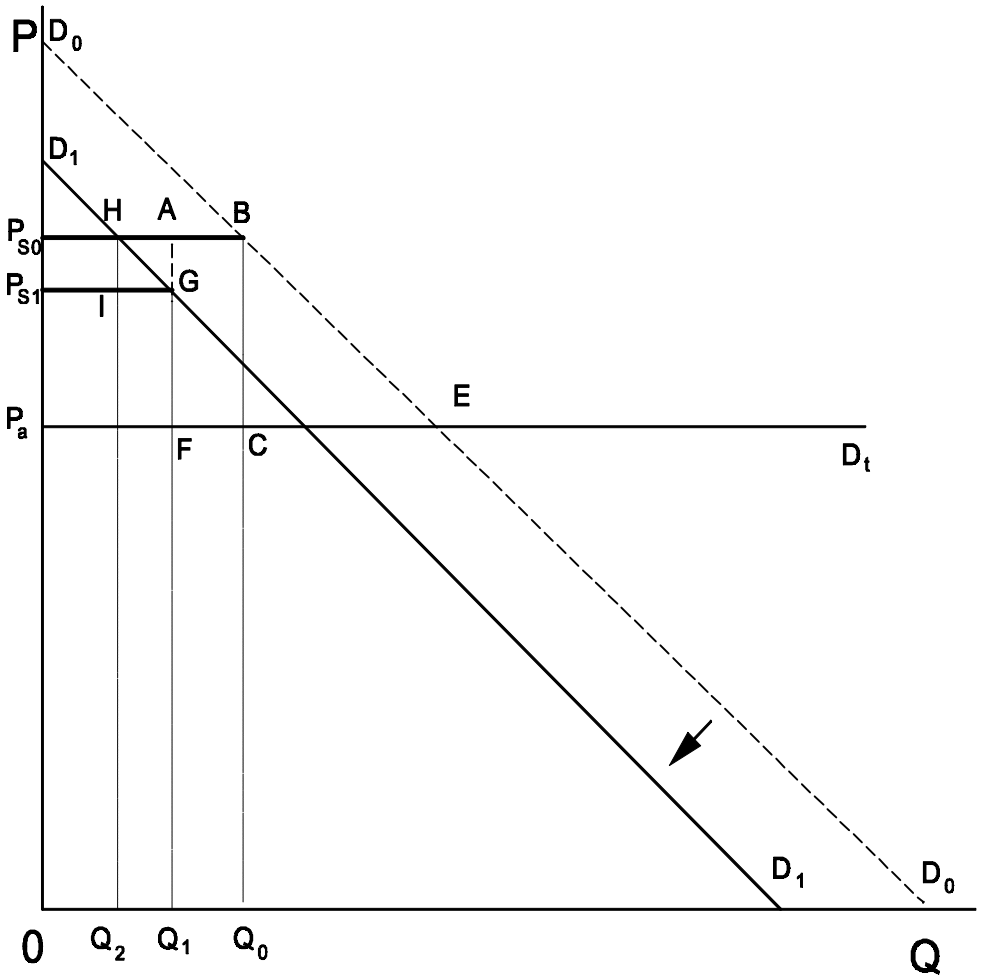
[a] Refer to Fig. 1, basic quota in 1996 = basic quota in 1995 × quota reduction rate under the new program for each region (reduction rate = 81.48%). [b] Effective quota = basic quota + undermarketings. [c] Area $P_{so}AG\ P_{s1}$ + Area ABQ_0Q_1. [d] Area $P_{so}AG\ P_{s1} = (P_{so} - P_{s1})Q_1$, where P_{s0} = \$678/ton, P_{s1} = \$610/ton, and Q_1 = total quota for each region in 1996. [e] Area $ABQ_0Q_1 = P_{so}(Q_0 - Q_1)$, where Q_0 = total quota in 1995. [f] Area $P_{so}AG\ P_{s1}$ + Area ABCF. [g] Area $FCQ_0Q_1 = P_a(Q_0 - Q_1)$, where P_a = weighted average of additional peanuts for 1992-94 = \$349.8/ton. [h] Area ABCF= $(P_{so} - P_a)(Q_0 - Q_1)$. [i] Area $P_{so}HG\ P_{s1} = (P_{so} - P_{s1})Q_2 + ½(Q_1 - Q_2)(P_{so} - P_{s1})$, where Q_2 = derived demand of quota peanuts under the previous support price for the 1996 crop based on estimated demand function.

Table 3. Long Term Economic Impacts of the New Peanut Program across regions.[a]

Year	Southeast[b]			Virgirnia-North Carolina[b]			Southwest[b]		
	Scen. 1[c]	Scen. 2[d]	Scen. 3[e]	Scen. 1[c]	Scen. 2[d]	Scen. 3[e]	Scen. 1[c]	Scen. 2[d]	Scen. 3[e]
	----------$1,000----------								
1996	Base	Base	Base	Base	Base	Base	Base	Base	Base
1997	-2,901	8,563	-8,646	-914	2,698	-2,724	-989	2,919	-2,947
1998	-2,901	8,732	-8,476	-914	2,751	-2,671	-989	2,976	-2,889
1999	-2,901	8,905	-8,311	-914	2,806	-2,618	-989	3,035	-2,833
2000	-2,901	9,081	-8,148	-914	2,861	-2,567	-989	3,095	-2,777
Total[f]	-11,603	35,281	-33,581	-3,656	11,116	-10,580	-3,956	12,025	-11,445

[a] Long term economic impacts equal the projected domestic demand for American produced edible peanuts under three hypothetical scenarios minus the minimum import access level of foreign peanuts under GATT, then multiplied by the current support price for quota peanuts. [b] Domestic demand for U.S. produced edible peanuts in 1996 in each region is presumably equal to total quota in 1996 derived from the basic quota released by USDA for each region. [c] Scenario 1: no change in domestic demand for the next four years. [d] Scenario 2: 2% increase annually in domestic demand. [e] Scenario 3: 2% decrease annually in domestic demand. [f] Rounded.

Figure 1. Economic Impacts of the U.S. Peanut Program



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