IMPACT OF DOMESTIC POLICY ON COMPARATIVE ADVANTAGE OF AGRICULTURE IN THE SOUTH

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The objective of this paper is to estimate the impact of domestic policy on comparative advantage of agriculture in the South. I utilize estimates of projected prices in a market-centered agriculture to examine the degree of insulation from market forces for major crops produced in the South and to calculate the relative net returns per acre in the absence of commodity programs. The price and net returns are probably below long-term equilibriums but are useful measures of *relative* prices and returns among commodities even if the returns are negative.

Results indicate that the South has diminishing comparative advantage for traditional crops such as cotton and sugar, and probably for fruits, vegetables, and tobacco. The South's comparative advantage in wheat, soybeans, and cattle and calf production would be accentuated in a world of freer trade in the absence of commodity programs. Comparative advantage is shifting to larger farms and smaller farms, the latter sustained by off-farm earnings, and is shifting away from mid-size family farms. This trend also would be enhanced by movement towards a market-centered agriculture.

Precise determination of comparative advantage would require a worldwide general equilibrium model. That model would estimate production, consumption, and international trade patterns which maximize returns (profits) to the most fixed factors, given the existing and forthcoming institutional constraints. That task far exceeds the scope of this paper; to the best of my knowledge, no one has succeeded in such an undertaking. The conceptual framework used in this paper is much less ambitious.

COMPARATIVE ADVANTAGE TRENDS MEASURED BY PRICES AND NET RETURNS

New farm legislation portends a trend toward loan rates that will allow the United States to be competitive in world markets. At issue is whether the South will be able to compete in international markets with lower loan rates, lower market prices, and lower real market prices and deficiency payments. Tables 1 and 2 provide some clues to comparative advantage under a market-centered agriculture.

Table 1 compares minimum projected commodity prices under a market orientation to 1984 support and market prices. Among grains, soybeans, and cotton, some commodities have been supported more than others. Compared to projected average low future market prices from various studies, feed grain market prices were relatively highest in 1984 and soybean prices were lowest. Feed grain prices were probably unusually high in 1984 because of PIK and the drought in 1983. Returns must consider target prices and deficiency payments which were highest relative to projected market prices for rice and cotton among commodities considered in Table 1. Hence, in the absence of supports, returns to these commodities could drop most and their comparative advantage in southern agriculture would be impaired. Projected minimum future market prices are most favorable for soybeans because the price of that commodity might fall the least with a market orientation.

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TABLE 1. SELECTED PRICES AND OTHER ECONOMIC INDICATORS OF COMPARATIVE ADVANTAGE IN SOUTHERN AGRICULTURE

Item	Commodity											
	Corn		G. sorghum		Wheat		Rice		Soybeans		Cotton	
	$/bu.	%A	$/bu.	%A	$/bu.	%A	$/bu.	%A	$/bu.	%A	¢/lb.	%A
1984:												
Average farm price	2.65	129	2.35	128	3.37	119	8.23	116	5.85	116	58.40	115
Loan rate	2.55	124	2.42	132	3.30	117	8.00	113	5.02	93	55.00	108
Target price	3.03	148	2.88	157	4.38	155	11.90	168	—	—	81.00	159
Nonland breakeven price:[a]												
Southeast	2.43	119	—	—	3.28	116	—	—	5.68	105	59.00	116
Delta	—	—	—	—	—	—	8.07	114	4.91	91	57.00	112
Southern Plains	—	—	2.63	144	3.81	135	—	—	—	—	66.00	129
Projected market low:												
USDA[b]	1.90		1.70[d]		2.54		—		6.17		48.00	
Johnson et al[c]	2.06		1.84[d]		2.85		7.56		4.99		54.00	
AAA 85[c]	2.18		1.95[d]		3.09		6.64[e]		5.08		—	
Average (A)	2.05		1.83		2.83		7.10		5.41		51.00	

[a] See Table 2 for source of entries.
[b] Langley and Price.
[c] Johnson et al., July 1985; Johnson et al., March 1985. AAA 85 refers to Reagan Administration proposal for loan rates set by moving average market price.
[d] Calculated as 90 percent of corn rates.
[e] Administration proposed estimate taken from Johnson et al., 1985, p. 147.

The comparative advantage of soybeans is also apparent in Table 2. It is the only commodity providing a positive return above nonland production costs under minimum market prices in the Delta region and the smallest loss per acre in the Southeast. Results suggest that the Southeast would not have a comparative advantage and might substantially exit from production of cotton and perhaps from corn. The advantages of double-cropping are not considered. It seems likely that efficiencies of double-cropping soybeans and wheat could keep these commodities competitive in the Southeast in a market-centered agriculture. Although data were not available for soybeans in the Delta, a wheat-soybeans double-cropping system would appear to have a comparative advantage. Cotton production in the Delta probably would decline significantly in the absence of government supports.

In the Southern Plains, the least loss per acre under market prices without supports is in wheat despite the fact that wheat has

TABLE 2. SELECTED INDICATORS OF COMPARATIVE ADVANTAGE AMONG CROPS IN SOUTHERN AGRICULTURE

Item	Corn	G. sorghum	Wheat	Rice	Soybeans	Cotton
Southeast:						
Nonland economic cost/acre[a]	$216.09	—	$124.26	—	$132.35	$424.31
Projected market return/acre[b]	$182.29	—	$107.23	—	$126.00	$365.40
Net return/acre[c]	-$33.80	—	-$17.03	—	-$6.35	-$58.91
Yield/acre[a]	88.92 bu.	—	37.89 bu.	—	23.29 bu.	716.47 lbs.
Breakeven price[d]	$2.43/bu.	—	$3.28/bu.	—	$5.68/bu.	$.59/lbs.
Delta:						
Nonland economic cost/acre[a]	—	—	—	$346.55	$121.47	$388.53
Projected market return/acre[b]	—	—	—	$304.80	$133.84	$349.85
Net return/acre[c]	—	—	—	-$41.75	$12.37	-$38.68
Yield/acre[a]	—	—	—	42.93 cwt.	24.74 bu.	685.98 lbs.
Breakeven price[d]	—	—	—	$8.07/cwt.	$4.91/bu.	$.57/lb.
Southern Plains:						
Nonland economic cost/acre[a]	—	$136.50	$99.27	—	—	$234.95
Projected market return/acre[b]	—	$94.94	$73.72	—	—	$181.02
Net return/acre[c]	—	-$41.56	-$25.55	—	—	-$53.93
Yield/acre[a]	—	51.88 bu.	26.05 bu.	—	—	354.94 lbs.
Breakeven price[d]	—	$2.63/bu.	$3.81/bu.	—	—	$.66/lb.

[a] U. S. Department of Agriculture, September 1985. Data are for 1984.
[b] Projected market price (A) shown in Table 1 times yield.
[c] Projected returns less nonland economic cost.
[d] Nonland costs divided by yield per planted acre in 1984.

been more favored than feed grains by government supports as noted in Table 1.

The minimum market prices projected for the future are for only a short-run equilibrium. Production of most commodities would be cut back in response to lower prices. It is highly unlikely that market prices would remain at levels that would fail to cover nonland costs and hence fail to bring forth wheat production from the Great Plains in the long run although many acres would be converted to pasture. Also, a lower value of the dollar will help to raise farm commodity prices and keep the United States competitive in world agriculture. In summary, the Southeast and Delta are expected to retain a comparative advantage in wheat and soybean production while the Southern Plains will maintain a comparative advantage in wheat production.

COMMODITY SHARES IN THE SOUTH

Given the above background, tables 3 and 4 provide additional historic perspective on the South's share of enterprises under commodity programs and how it would fair in the absence of commodity programs and protection against imports. Among enterprises covered by commodity programs, census data are most adequate for separating the contribution of grains, soybean, cotton, tobacco, and dairy to the economy of the South and United States.

Agriculture of the South relies only slightly more than do other regions on receipts from enterprises covered by commodity programs, Table 3. The South and other regions as a whole received 46-47 percent of receipts from covered commodities in 1964 and 1982. The East South Central Division received more than half its receipts from covered commodities in 1964 and 1982, while the South Atlantic Division received only 36 percent of its receipts from such commodities in 1982.

Major changes have occurred in the composition of enterprises covered by commodity programs. Most notable is the declining share of cotton and the rising share of grains and soybeans, the latter being frequently double-cropped on land formerly in cotton. This trend is consistent with evidence of comparative advantage noted earlier in tables 1 and 2.

Table 4 provides additional insight into how the South has fared compared with the rest of the United States in enterprises covered by commodity programs. Much of the tobacco crop, of which 95 percent is grown in the South, and which accounted for 7.5 percent of commodity receipts in the South would be lost to competition from foreign countries utilizing low-cost labor. Because tobacco is fairly labor intensive, absence of price and import protection would seriously undermine the industry. Consolidation of production on larger units to achieve economies of size from mechanization would maintain some production.

Although 62 percent of United States cotton was produced in the South in 1982, the percentage was down sharply from 1964 due to competition from California and Arizona. Depletion of the underground water supplies in the Southern High Plains and the emergence of a wheat-soybean double-crop rotation as a profitable alternative in the Delta further

TABLE 3. PERCENTAGE OF TOTAL FARM SALES BY COMMODITY, REGION, AND FOR THE UNITED STATES, 1964 AND 1982

	Region											
	South Atlantic[a]		East South Central[b]		West South Central[c]		Total South		Other		United States	
Commodity	1964	1982	1964	1982	1964	1982	1964	1982	1964	1982	1964	1982
	percent											
Wheat	0.7	2.1	0.8	3.8	5.8	9.6	2.6	5.4	5.3	7.5	4.5	6.9
Other grains	6.7	4.4	7.3	4.4	7.2	12.4	7.1	7.5	18.7	14.3	15.1	12.3
Soybeans	2.5	6.7	4.3	13.7	4.8	7.5	3.8	8.7	5.2	8.8	4.8	8.7
Cotton	5.5	1.2	22.3	8.8	23.2	12.2	16.1	7.2	2.1	1.8	6.4	3.5
Tobacco	17.7	12.2	11.2	12.0	0.0	0.0	9.6	7.5	0.3	0.2	3.1	2.3
Dairy	8.8	9.0	8.7	8.2	5.8	5.9	7.6	7.6	14.6	14.7	12.5	12.6
Subtotal	41.9	35.6	54.6	51.0	46.8	47.6	46.8	43.9	46.2	47.3	46.4	46.3
Other	58.1	64.4	45.4	49.0	53.2	52.4	53.2	56.1	53.8	52.7	53.6	53.7
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
$ Million	4,476	16,031	2,724	10,044	4,261	16,371	11,460	42,446	25,807	102,317	37,267	144,763

Source: U. S. Bureau of the Census, 1967 and 1984; and U. S. Department of Agriculture, January 1985.
[a] Represents West Virginia, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, and Florida.
[b] Represents Kentucky, Tennessee, Mississippi, and Alabama.
[c] Represents Arkansas, Louisiana, Oklahoma, and Texas.

TABLE 4. PERCENTAGE OF SALES BY REGION FOR SELECTED COMMODITIES, 1964 AND 1982

Region	Commodity													
	Wheat		Other grains		Soybeans		Cotton		Tobacco		Dairy		Other	
	1964	1982	1964	1982	1964	1982	1964	1982	1964	1982	1964	1982	1964	1982
	percent													
SA[a]	1.8	3.4	5.4	3.9	6.3	8.5	10.2	3.9	68.0	58.6	8.5	7.9	13.0	13.3
ESC[b]	1.2	3.8	3.5	2.5	6.6	10.9	25.4	17.9	26.0	36.1	5.1	4.5	6.2	6.3
WSC[c]	14.8	15.7	5.5	11.4	11.3	9.7	41.4	40.3	0.0	0.0	5.4	5.3	11.3	11.0
South	17.8	22.9	14.4	17.8	24.2	29.1	77.0	62.1	94.0	94.7	19.0	17.7	30.5	30.6
Other	82.2	77.1	85.6	82.2	75.8	70.9	23.0	37.9	6.0	5.3	81.0	82.3	69.5	69.4
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
$ Mil.	1,672	9,990	5,632	17,822	1,780	12,661	2,390	4,948	1,168	3,342	4,637	18,273	19,986	77,726

[a] Represents South Atlantic: West Virginia, Delaware, Maryland, Virginia, North Carolina, South Carolina, Georgia, and Florida.
[b] Represents East South Central: Kentucky, Tennessee, Mississippi, and Alabama.
[c] Represents West South Central: Arkansas, Louisiana, Oklahoma, and Texas.
Source: U. S. Bureau of the Census, 1967 and 1984; and U. S. Department of Agriculture, January 1985.

eroded the position of cotton. Cotton has been highly favored by commodity programs with an unusually large direct payment component as noted earlier. A number of developing countries are utilizing advanced technology and low-cost labor to produce cotton in competition with American producers. Finally, the United States textile industry increasingly is unable to compete. Textile imports into the United States frequently contain considerable foreign-sourced cotton. All these elements point to sharply lower production and receipts for cotton in the absence of commodity programs. Elimination of commodity programs and trade barriers would accelerate the past westward trend in cotton production until a relatively few irrigated regions of the Southwest and West remained in production.

The South accounted for about one-fifth of United States dairy production and dairy accounted for nearly 8 percent of farm receipts in the South in 1982, Table 4. The United States does not possess a comparative advantage in manufactured milk products and termination of price supports and import protection would eliminate much United States output of manufactured milk products. Small- and medium-sized farms serving other than fluid milk markets would be especially hard hit.

A major share of manufactured milk product processing is in the "Dairy Country" of the Lake States and Northeast. These areas with a comparative advantage *within* the United States would be hurt most initially by termination of price supports and import controls. Dairy operations in the South produce mostly for local fluid milk consumption and are somewhat insulated from competition by high transport costs of fluid milk. However, if barriers to transportation and storage such as regulations regarding market orders and shipment and sale of reconstituted, sterile, or related milk products were terminated, the South would be severely influenced because reconstituted or related milk products produced in the Lake States and Northeast would be shipped to the South for fluid consumption.

The South accounts for approximately one-fifth of the nation's grain production and the share is growing. Although wheat has been supported relatively more than feed grains and would be affected more than would feed grains by a market-centered agriculture, the United States has a sufficient comparative advantage in wheat so that absence of commodity programs probably would increase the share of grains in the South. Feed grains and soybeans also would replace some commodities in which the United States could not compete if price supports and import barriers were dropped.

In short, some commodities in which the South is prominent, such as tobacco and cotton would be disadvantaged by an unsupported, unrestricted market. The same conclusion holds for sugar and possibly rice although data were not available for inclusion in the foregoing tables. The South would not be competitive in sugar production in an open market. Although tobacco and peanut production could be marginal, restructuring of production patterns to larger and mechanized operations would keep some production competitive in United States markets. In-depth analysis would be required for more definitive conclusions. Cotton, tobacco, and sugar account for less than one-fifth of farm receipts in the South.

Broiler and cow-calf operations are likely to remain competitive in the South. Fruit and

vegetable production especially prominent in Texas and Florida increasingly would be challenged by Mexican production in the absence of barriers to trade and with tighter restrictions on use of alien labor. A market-centered agriculture would entail more acres of soybeans, wheat, feed grains, forest, and pasture.

Technology will influence future comparative advantage especially for dairy, corn, soybeans, wheat, and perhaps cotton. New technology is likely to reinforce current geographic comparative advantage rather than shift patterns of production to new areas. The South for the most part lacks an absolute advantage within the United States in any of these commodities. The South will produce to the extent that demand is not met by regions with an absolute advantage such as wheat in the Plains, corn and soybeans in the Corn Belt, and cotton in the far Southwest. Thus, production in the South will be sensitive to export demands which, if strong, will expand production in relatively more marginal areas.

COMPARATIVE ADVANTAGE BY FARM SIZE

Data by economic sales class of farms in Table 5 are for the United States but supply some insights into comparative advantage by size of farm in the South in a more market-centered agriculture. The enterprises supported by commodity programs, shown in Table 5, accounted for 44.5 percent of farm output in 1982 but the figure would be a few percentage points higher if peanuts, wool, sugar, and other minor commodities not shown in the original data source were included.

Only 21.2 percent of receipts on the largest farms are from covered commodities in part because payment limitations discourage participation in programs and in part because economies of size favor large-scale operations for production of fruits, vegetables, and nursery products and for cattle, calves, and poultry. Of course, some of these commodities receive market protection through marketing orders or other negotiated or administered pricing arrangements.

The smallest farms also rely less on enterprises covered by commodity programs than do other farms. It is notable that small farms do not emphasize labor-intensive enterprises such as fruits, vegetables, and nursery products but instead emphasize relatively labor-extensive enterprises such as cattle and calves—perhaps because many are part-time operators with limited time for farming.

Mid-sized farms rely most heavily on enterprises covered by commodity programs and initially would be relatively most disadvantaged by termination of such programs. The implication is that termination of commodity programs would speed the trend toward a dual agriculture comprised of large farms accounting for most output and many small part-time farms accounting for most farm numbers. Even with commodity pro-

TABLE 5. SHARES OF PRODUCTS SOLD BY ECONOMIC CLASS OF FARMS, UNITED STATES, 1982

Commodity	Total	Economic class of farms by agricultural products sold						
		$500,000 or more	$250,000 $500,000	$100,000 $249,999	$40,000 $99,999	$20,000 $39,999	$10,000 $19,999	Less than $10,000
Wheat	5.9	2.4	6.1	7.3	9.0	9.7	8.0	4.5
Other grains	13.8	5.6	16.9	19.2	19.0	17.7	14.3	8.7
Soybeans	7.9	2.2	8.7	10.8	12.0	12.4	11.2	7.5
Cotton	2.4	3.5	3.1	1.9	1.6	1.3	1.0	.5
Tobacco	2.1	.3	1.4	2.0	3.1	5.6	8.1	8.9
Dairy	12.4	7.2	12.1	17.9	18.6	9.5	3.7	.8
Subtotal	44.5	21.2	48.3	59.1	63.3	56.2	46.3	30.9
Fruits, veg., and nursery	10.5	19.4	8.7	5.5	5.1	6.2	6.5	6.0
Cattle and calves	24.0	36.3	16.5	14.5	16.3	22.8	31.5	45.2
Poultry and products	7.4	11.8	10.6	6.2	2.2	1.0	.6	.6
Hogs and pigs	7.5	4.0	9.9	10.1	8.5	7.5	6.7	5.4
Other	6.1	7.3	6.0	4.6	4.6	6.3	8.4	11.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Total (1000)	131,900	42,764	19,851	32,930	21,642	7,142	3,694	3,566
Percent[a]	100.0	32.4	15.1	25.0	16.4	5.4	2.8	2.7

Source: U. S. Bureau of the Census, 1984, pp. 102-3.
[a] Total across columns adds to only 99.8 percent because abnormal farms were excluded.

grams, larger farms produce at less economic cost per dollar of total receipts (including government payments) than medium- and small-sized farms; termination of programs could accentuate the pattern (Tweeten, December 1984, p. 106). This conclusion for agriculture in total is backed by studies for specific types of farms (Smith et al.). In a longer-term context, commodity programs have provided security and capital encouraging farmers to leverage equity to expand farm size. This is one reason why comprehensive studies have concluded that commodity programs have been neutral in causing the trend toward larger and fewer farms in the long run (Tweeten, 1984, p. 33).

MACROECONOMIC POLICIES AND COMPARATIVE ADVANTAGE

The principal objective of this paper has been to analyze the impact of alternative public policies, especially commodity programs, on comparative advantage of agriculture in the South. Although emphasis by assignment is on commodity programs, a strong case can be made that macroeconomic policies have swamped the impact of commodity programs in the 1980s.

To illustrate, the dollar was estimated to be overvalued in relation to longer-term equilibrium exchange rates by 35-40 percent in 1984 (Bergsten; Thurow). Adjusting for the fall in the value of the dollar to late 1985, the dollar remained overvalued by perhaps 25 percent. Each 1 percent rise in the value of the dollar reduces United States farm exports by an estimated .5 percent in the short run and 1 percent in the long run (Barclay). Hence, exports may be 12 to 25 percent higher today had the dollar been at normal long-term equilibrium levels in the 1980s and late 1970s. Given that exports are 25 percent of demand for farm output, it follows that a more normal dollar would have added 3 to 6 percent (.25 X 12 percent to 25 percent) to demand for farm output—well within the range of government commodity program diversions on the average in recent years (Tweeten, December 1984, p. 96). Although government outlays for commodity programs were as high as $30 billion in 1983, if payment-in-kind at acquisition price is included and would have averaged $15 billion in recent years, they have averted neither falling real farm commodity and land prices nor accumulation of burdensome stocks.

Real interest rates averaging double to triple normal rates have reduced net farm income. Each one percentage point of interest rate adds approximately $2 billion to interest expense and subtracts a like amount from farm net income. Export expansion coupled with a reduction of an estimated 4 percentage points in interest rates under a more nearly balanced federal budget eventually may do more to restore profitability to agriculture than will commodity programs.

SUMMARY AND CONCLUSIONS

The higher dollar cannot eliminate comparative advantage for all goods produced in the United States. By definition, comparative advantage means that a country or region can produce one or more goods with greater relative efficiency than can other countries or regions. Comparative advantage exists in goods and services providing the greatest profit (returns to the most fixed resources). Today, in the absence of commodity programs, returns to land would be negative for grains and soybeans—commodities for which the United States presumably has the greatest comparative advantage. Excess capacity in grains is approximately 10 percent. If the demand elasticity is −.25 in the short run, release of the excess capacity would drop receipts by 40 percent—somewhat in excess of land costs which traditionally average approximately one-third of receipts.

While the foregoing may appear to argue against comparative advantage in any commodity, such analysis is seriously flawed. First, comparative advantage needs to be evaluated near equilibrium in exchange rates. The current high exchange rates are a transitory phenomenon associated with Reaganomics—a policy featuring unsustainably high federal budgets and balance of payment deficits. Second, in the absence of commodity programs, asset values would adjust. In the short run, comparative advantage must be judged by returns above variable costs. That may mean producing commodities where losses are least in the short run.

Evidence suggest that the South and the United States have a comparative advantage in grains and soybeans. Judging by supply-demand and by input and output prices under more normal circumstances but with open markets, the South does not have a comparative advantage in production of sugar, wool,

and manufactured milk products. More of these commodities along with additional tobacco, cotton, fruits, and vegetables would be imported in the absence of price supports and trade restrictions. Red meat, poultry, eggs, and milk for fluid consumptions have characteristics of "nontraded" goods. In an open world market, the United States would export or import only modest amounts of these commodities. Production in the South and in other domestic regions would continue and would largely serve domestic consumption needs. Although considerably more fruits and vegetables would be imported, a significant portion of the domestic industry would remain. Evidence for rice and peanuts is ambiguous.

The foregoing analysis is based on a free market in the United States but with continuation of current food and farm policies in the rest of the world. A global market-centered agriculture would substantially reduce production of rice in Japan and of wheat in the European Economic Community. The impact would be to reinforce the United States comparative advantage in grains.

Farm exports have been discouraged and imports encouraged by the high value of the dollar in relation to a longer-term equilibrium consistent with lower federal deficits, lower real interest rates, and a sustainable trade balance. But farm exports have also been reduced by loan rates providing a price umbrella for competitors to undercut United States prices. Thus, the makeup of future commodity programs will play a role in comparative advantage and trade. Lower loan rates can allow the United States to sell abroad and avoid excessive supply control or stock accumulation. Yet, the analysis herein suggests that the South cannot produce at market-clearing prices without considerable loss. The implication is that, although a long-term market-centered agriculture has merit, direct payments may be necessary to avoid massive losses to farmers until real interest rates and the dollar fall, economic crisis in a number of developing country markets is alleviated, and excessive stocks (depressing market prices) are worked down through a payment-in-kind or related program. Also, receipts from commodities in which the South and the United States have a comparative advantage will be enhanced over the longer run by successful negotiations to reduce global protectionism in trade and domestic agricultural policies.

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