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EFFECTS OF FEDERAL PROGRAMS AND POLICIES ON THE STRUCTURE OF AGRICULTURE

by

Charles V. Moore

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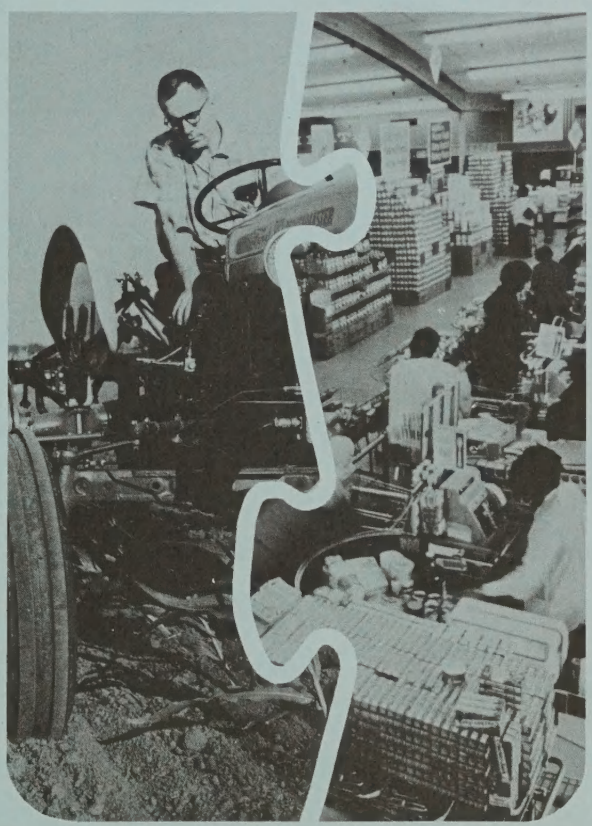

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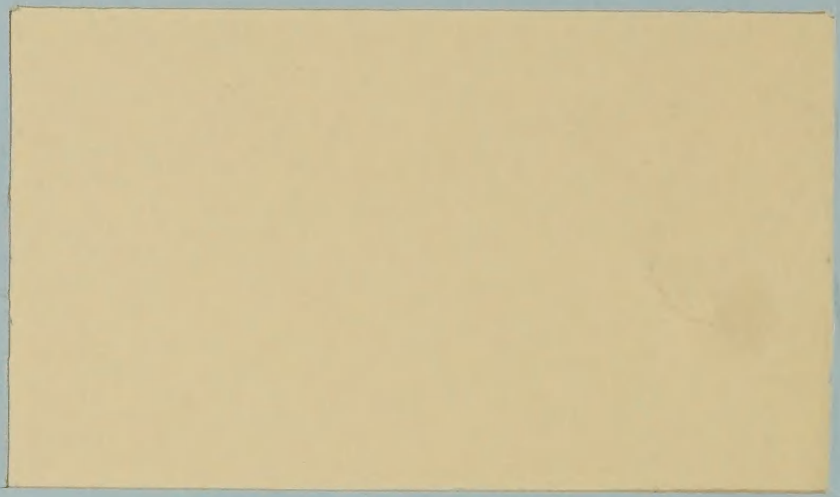

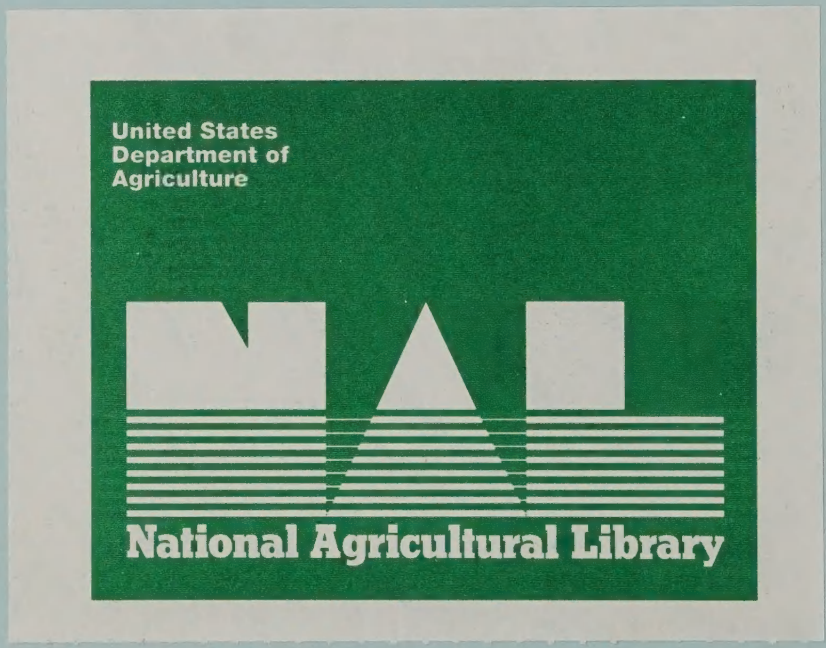
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Charles V. Moore

Charles Moore is an Agricultural Economist, with the Economic Research Service, U.S. Department of Agriculture. The author appreciates the comments of J.R. Martin, A.F. McCalla, S.S. Johnson, Odell Walker, and E.V. Jesse on earlier drafts. The opinions expressed here, however, are my own and do not reflect the policies of the U.S. Department of Agriculture.

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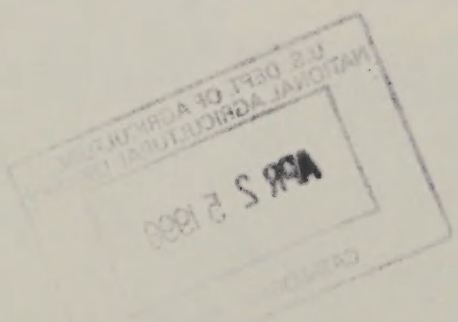


EFFECTS OF FEDERAL PROGRAMS AND POLICIES ON THE STRUCTURE OF AGRICULTURE

by

Charles V. Moore, NEAD, ERS, USDA

Government intervention in the food and fiber sector is seldom neutral with respect to its impact on the structure of agriculture. Even programs and policies not directly targeted towards agriculture can have important influences.

Few would argue that technological change has not had an overriding influence on structure and much has been written concerning its effects (see [5], [12], [13], [15], and [18]). However, we will argue the cumulative effect of nontechnological programs and policies are also important. Further, within the framework of adaptive control processes, these programs and policies are the primary control variables through which the Federal Government can influence the rate of change in the structure and ultimately, who controls agriculture.

Objectives

The objective of this paper is to catalogue and analyze nontechnological programs and policies of the Federal Government and their impact on the structure of agriculture. Two earlier studies, Quance and Tweeten [17] and Dahl [6], focused attention on this subject. However, this paper has a much broader scope in terms of the number of programs and policies analyzed.

Framework of Analysis

Industrial organization literature defines structure as the number and distribution of firms in an industry, the nature of the product, and the location of production. Federal nontechnological programs and policies will be analyzed in light of their historical and cumulative affect on these structural variables.

Column 1 in Table 1 lists a large number of Federal programs and policies which are analyzed in the following section. They have been rated based on subsequent analysis as to their importance in causing a change in the structure of agriculture. Due to the qualitative nature of the analysis, these ratings must not be considered conclusive but in terms of testable hypotheses which may or may not be accepted after more rigorous analysis.

Programs and Policies of the USDA

The USDA manages a wide variety of nontechnological programs as enacted by Congress. For purposes of this paper, they have been grouped under four headings: (1) Price support and production control programs; (2) Resource based programs, (3) Credit programs, and (4) Other miscellaneous programs.

1. Farm Price Support and Production Control

Since the Agricultural Adjustment Act of the 1930's, these programs have changed in form, name, and content but with the same overall goal of maintaining farm income and an adequate supply of food and fiber based on a philosophy of economic efficiency. In Table 1, most of the programs which were operable in the mid-1960's are listed.

The common characteristic of the commodity programs is that the level of benefits to an individual producer is highly correlated with the volume of output and, therefore, with the level of land resource ownership.[1/] Further, almost all of these program benefits are attached to the land and not to the individual operator, the benefits being transferred when title to the land is transferred.

Bonnen [1], using USDA data from the mid-1960's on the distribution of acreage allotments and program benefits, calculated the degree of concentration of these benefits by allotment class size. These data shown in Table 1

TABLE 1

Federal Nontechnological Programs and Policies Affecting the Structure of American Agriculture

Agency & program or policy	Importance in causing a change in structure			
	High	Medium	Low	Gini ratio
Farmer & Farm Manager Total Money Income				0.468 a/
U.S. Dept. of Agriculture				
Price Support & Production Control Programs				
1. Wheat Diversion Payments	x			0.480 b/
2. Wheat Certificates	x			0.544 b/
2a. Wheat Price Support	x			0.566 b/
3. Wheat Loans				0.253 c/
4. Feed Grain Diversion Payments	x			0.405 b/
5. Feed Grain Price Support	x			0.588 b/
6. Feed Grain Loans	x			0.512 c/
7. Wool Payments		x		0.324 c/
8. Cropland Conversion		x		0.308 c/
9. Conservation Reserve			x	0.211 c/
10. Cropland Adjustments			x	0.136 c/
11. Soil Bank			x	
12. Cotton Diversion Payments	x			0.248 c/
13. Cotton Price Support	x			0.653 b/
14. Cotton Loans	x			0.445 c/
15. Sugar Payments — Cane				C-.799 b/
15. Sugar Payments — Beet	x			B-.456
16. Rice Price Supports	x			0.632 b/
17. Peanut Price Support	x			0.522 b/
18. Tobacco Price Support	x			0.522 b/
19. Dairy Price Support	x			
20. Federal Marketing Orders			x	

Continued on next page.

Table 1 (continued)

Agency & program or policy	Importance in causing a change in structure			
	High	Medium	Low	Gini ratio
Resource Based Programs				
1. Agricultural Conservation Payments			x	0.271 b/
2. Conservation Technical Assistance		x		
3. Watershed Protection		x		
4. P.L. 566 - Irrigation Supplies	x			
5. Forest Service Grazing Rights		x		
Credit Programs				
1. Farm Operator Loans (FHA)			x	
2. Farm Ownership Loans (FLB)		x		
3. Production Loans (PCA)		x		
4. Co-op Loans (Bank for Co-ops)		x		
5. Electrical Loans			x	
6. Telephone Loans			x	
Other				
1. Statistical Reporting Service		x		
2. Market News Service		x		
3. PL 480 Concessional Sales		x		
4. Export Subsidies on Commercial Sales		x		
5. Packers and Stockyard Act			x	
U.S. Department of the Interior				
1. Construction and Operation of Irrigation Water Supplies	x			
2. Loans for Irrigation Distribution Systems		x		
3. Drainage of Agricultural Lands		x		
4. Bureau of Land Management Grazing Rights		x		

Continued on next page.

Table 1 (continued)

Agency & program or policy	Importance in causing a change structure			
	High	Medium	Low	Gini ratio
U.S. Army Corps of Engineers				
1. Construction of Flood Control and Irrigation Dams	x			
2. Flood Plain Protection		x		
3. Construction and Maintenance of Navigable Rivers and Harbors		x		
U.S. Department of the Treasury				
1. Internal Revenue Service				
a. Cash accounting	x			
b. Sub Chapter S			x	
c. Limited partnerships		x		
d. Capital gains	x			
U.S. Department of Justice				
1. Capper-Volstead Act		(x)		
2. Antitrust Division			(x)	
Federal Trade Commission			(x)	
U.S. Tariff Commission				
1. Tariff and nontariff restrictions on imports		x		
U.S. Environmental Protection Agency				
1. Solid Waste Disposal			x	
2. Water Quality Standards			x	
3. Pesticide Safety			x	
4. Air Quality Standards			x	

Continued on next page.

Table 1 (continued)

Agency & program or policy	Importance in causing a change in structure			
	High	Medium	Low	Gini ratio
Interstate Commerce Commission				
Railroad & Truck Freight Rates			x	
Monetary and Fiscal Policy				
1. Valuation of Dollar in Relation to Other Currency		x		
2. Money Market Operations			x	

a/ Boyne [2].

b/ Bonnen [1].

c/ McKee and Day [14].

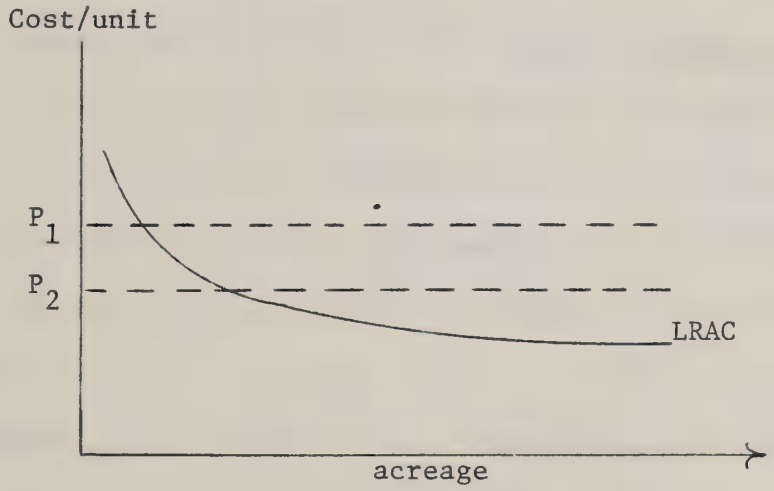
indicate that at this point in time, except for the sugar beets and feed grain diversion programs, direct payments from the commodity programs are more highly concentrated among the large farmers than farmer and farm manager total money income itself.[2/] That is, the Gini ratio for the commodity programs is greater than that calculated for farm income by Boyne [2]. The data from McKee and Day [14] in Table 1 are not directly comparable to the Bonnen data because their unit of observation was a state and they show only the concentration ratio across states and not by farm size.

The original Bonnen data indicate that under almost every program the top 20 percent of the farmers received more than 50 percent of the benefits.

A reasonable question to ask at this point is, what has this to do with the structure of agriculture? Based on firm growth theory, it can be argued that if benefits are concentrated among the larger farm sizes, then capital accumulation necessary for farm size expansion will be more rapid among the larger farm sizes than the smaller ones. That is, ceteris paribus, the growth rate will be higher among large sized farms than in the smaller size groups.

The level of commodity price supports can also have an affect on net income per unit, capital accumulation, and, therefore, growth rates by farm size class. For example, Figure 1 depicts a hypothetical long-run average cost curve for cotton farms. If the support price level is set at P_1, farm income for virtually all farm sizes will exceed their unit costs. A support price set at this level would tend to retain a large number of small farmers in agriculture. However, the economic rent accruing to large land owners would be considerable, allowing them to accumulate capital at a high rate and placing them in a position to bid higher prices for land to expand their operations.[3/] In this case, the rate of exodus of small farmers would be primarily a function of their opportunity cost of off-farm employment.

FIGURE 1



On the other hand, if the price support level is set at P_2, many of the small producers would be forced out of farming and larger producers would still be accumulating capital assets, but at a slower rate. To the extent that commodity program benefits are capitalized into the price of land, land prices would be lower under support price P_2 than under P_1. It is not clear from this analysis which support price level -- P_1 or P_2 -- would cause the most rapid change in structure. It does point out the conflict in objectives created by attempting to "solve" the rural low income problem and the excess resources problem with a single price support program.

The Gini concentration ratios in Table 1 are representative of the mid 1960's and indicate nothing about the changes that might have occurred over the time period from 1933 to present. If our earlier hypothesis that concentration of program benefits in the larger farm class intervals gives an economic advantage to these farms with respect to expansion is correct, then the cumulative affect of similar Gini ratios would do much to explain historical changes in the distribution of farm sizes. Any quantitative estimation of this relation would have to be in the form of a simultaneous equation model because over time the Gini ratio increases (greater concentration) as the cumulative effects of previous perverse income distributions allow a bidding advantage to larger farm owners.

2. Resource Based Programs

Agricultural Conservation Program Payments are direct payments made to farmers for a share of the costs for grass waterways, lime, and other soil-conserving practices. There is an annual upper limit to payments for a farm and Bonnen's Gini ratio of 0.271 indicates a reasonable degree of neutrality in their distributional effects.

Conservation technical assistance is provided by the U.S. Soil Conservation Service in planning many of the conservation practices paid for under A.C.P. However, the design cost for a conservation practice is not limited by the ceiling on A.C.P. payments and, therefore, large farms may take advantage of the technical assistance service to its full extent although cost sharing of the actual construction costs are limited in any one year. It can be hypothesized that Conservation Technical Assistance would be somewhat more perverse in its impact.

Watershed Protection covers those programs larger than individual farms such as river basinwide drainage and removal of storm drainage from low-lying lands. These projects both improve the productivity of existing agricultural lands as well as bring former wastelands into production. Assuming that benefits per acre within a project area are equal, benefits per farm would accrue to land owners in the same proportion as resource ownership. If the further assumption is made that benefits from drainage and watershed protection are distributed in the same manner as total money income of farmers and farm managers, then Boyne's [2] results would indicate that the lower 60 percent of farmers received only about 26 percent of the benefits and the top 5 percent of all farmers received about 20 percent of all benefits with a Gini concentration ratio of 0.468.

Public Law 556 provides cost sharing and low interest loans for irrigation water supplies and flood control on small watersheds. The program has been used in the past to provide supplemental irrigation water to new and existing irrigated lands as well as flood control to these lands. Estimates of the Gini ratio for this program area have not been made, but two effects on structure can be observed.

First, due to the subsidy involved in low interest loans and cost sharing, producers in a project service area have a cost advantage over farmers who develop private water supplies producing the same commodities and also with respect to producers in other geographic areas of the country. Although the dollar magnitude involved is small compared to Bureau of Reclamation and Army Corps of Engineers projects, it would appear that benefits would tend to fall more to larger land owners and not be distributed uniformly over all states.

Forest Service grazing rights are the rights issued to livestock owners to graze animals on Forest Service managed lands. To the extent that grazing fees charged are less than the long-run equilibrium derived demand for these rights, a subsidy exists. The distribution of benefits would be in proportion to the animal units of livestock grazed on the public lands.

3. Credit Programs

There are four major types of lending activities originally sponsored and supervised by the U.S. Department of Agriculture. The Farmers Home Administration makes loans to farm operators who are unable to obtain credit through normal credit sources. These loans which carry maximum limits would appear to redistribute income towards the lower income groups and contribute to maintaining small farms in agriculture.

Loans through the Federal Land Bank, Production Credit Associations and Bank for Cooperatives are highly competitive with commercial banks and insurance companies for long-term, intermediate, and short-term loans with respect to interest rates and services. At its inception, initial capital was made available to the Farm Credit Administration from the Federal Treasury but at the present time all of these funds have been repaid and

individual components of the F.C.A. issue their own bonds in the financial markets. These quasi public institutions operate as user co-ops and do not pay income taxes as do commercial lending institutions.

The affect of Farm Credit Administration components lending activities on the structure of agriculture is not easily determined. One fact is reasonably clear however. Namely, that all types of credit -- long, intermediate, and short-term -- are more easily available and at relatively lower interest rates to agricultural borrowers than it would have been in the absence of the Farm Credit System. This has no doubt made entry of new firms into the sector easier, i.e., reduced barriers to entry, but at the same time lower interest rates aid in capital accumulation and expansion of existing firms. On balance, low interest rates and ample supplies of credit probably have tended to increase the average size of farm and encouraged expansion of cooperative marketing and processing facilities.

Federal loans to rural electrical and telephone cooperatives would appear to have been neutral in their impact on farm structure. Only to the extent that reduced electrical energy rates have encouraged the substitution of capital for human energy and allowed one man to operate more units of land, livestock, or poultry can it be said that these loans have had an impact on the distribution of farm sizes.

4. Other USDA Programs and Policies

Information has many characteristics of a public good. The supply of statistical information gathered and released by the Department of Agriculture is not diminished by the consumption of one user. Access to these data is neutral with respect to size of firm. However, the ability to utilize these data is biased towards large size firms. The Statistical Reporting Service of USDA collects and disseminates data on crop acreage

and production, livestock on feed, production intentions and prices. Much of these data are used in the forward planning processes of agricultural production and processing firms. The cost of utilization of these data per firm is fairly constant, however, since larger firms can spread this cost over more units of output, there are significant economies of size in their utilization. Stated another way, the value of information is greater for large firms than for small firms [16, p. 226].

The Market News Service collects and disseminates price and volume data in major commodity markets. Access to these data is equal to firms of all sizes. However, as in the case above, the value of an information bit is greater for a large firm than a small one. This leads to the hypothesis that information is not neutral in its impact and has tended to give an additional net economic advantage to large firms and thereby cause changes in the structure of agriculture, decreasing the number and increasing the average size of firms.

The Commodity Credit Corporation of the USDA started accumulating stocks of agricultural commodities as a function of their price support program in 1949. These stocks reached a peak value of almost $6.5 billion in 1959. Export sales on concessional terms and gifts to developing countries were made under Public Law 480 for humanitarian reasons and to reduce the magnitude of these stocks.

Due to the price differential between the domestic support price and world market price for agricultural commodities, it was the policy of the Federal Government to pay an export subsidy on commercial sales by private grain traders. Schuh [19] has argued persuasively that the results of high domestic price supports, export subsidies, and concessional sales led to an increased rate of adoption of new technology, expansion of farm size and a

withdrawal of labor resources from U.S. agriculture. The cumulative effects of these programs are highly correlated with the rapid decline in farm numbers in the period 1953 to 1970.[4/]

The final USDA program to be analyzed is the enforcement of the Packers and Stodkyard Act. This Act contains many provisions specifically prohibiting unfair trade practices and requiring veracity in dealings with livestock producers by meat packers and stockyards. The original Act, passed in 1921 and as later amended, has placed considerable stress on maintaining fair dealings in the livestock industry. One effect of the Act has been to provide equal access to auctions and buyers for producers regardless of size. This in itself has tended to help retain small producers in the industry.

Programs of U.S. Department of the Interior

The Bureau of Reclamation is the planning and construction agency for the Department of the Interior. Bureau operations are limited to the Western states and as the name implies, its initial responsibility was and (although to a lesser extent) continues to be that of bringing into production or adding to the productivity of agricultural lands by developing irrigation water supplies and drainage systems.

There is a significant subsidy to land owners within Bureau project areas. This subsidy although indirect comes in two major forms. First, as an interest-free loan on that share of project costs allocated to irrigation. Second, in the form of water charges based on "ability to pay" which in most cases is below a cost which would generate sufficient revenues to repay project costs within the project planning period.[5/]

A basic conflict in objectives exists between the USDA commodity supply management programs and policies and the reclamation objectives of USDI. This conflict has been shown most succinctly by Heady, et al. [4] who points

out that while the USDA programs recognized an excess of resources in agriculture and implemented acreage control and price support programs to bring supply and demand into equilibrium, at the same time the Bureau of Reclamation was investing public funds to expand the resource base in the Western States. That is, on one hand the Bureau of Reclamation was subsidizing additional land being brought into production or increasing its productivity with supplemental irrigation water and drainage while on the other hand the USDA was paying farmers to take land out of production. Howe and Easter [10] estimate that the total cost of land retirement and price support for publically served irrigated land could have been as high as $350 million in 1964.

A second and more direct effect on the structure of agriculture by USDI activities is the displacement effect of additional irrigated acreage in the West. Additional resource capacity with projects subsidized by the Federal Treasury has caused a displacement or shift of producing areas from the rain-fed East to the West. One of the clearest examples is the shift of cotton production out of the Southeast to the Southwest. Concurrent with this shift in the geographic location of cotton production was a significant increase in the average size of cotton farms. However, due to the much higher cotton yields per acre in the new producing areas of the Southwest, fewer acres of land were required to maintain the same total national output. This same displacement effect has also been noted within a state or river basin. For example, Dean and King [7] demonstrate how new irrigation water developed under the California Water Plan and the Central Valley Project of the Bureau of Reclamation could depress product prices and displace production of specialty crops in traditional growing areas in California. In this case as well, farm sizes are much larger in the new producing area than in the displaced area.

A subsidy is also contained in the Bureau's programs which provides interest-free loans for irrigation organizations within their project service areas for construction of irrigation distribution systems to deliver water to farm headgates and for river basinwide drainage systems for irrigation return flows. The benefits of the subsidies accrue directly to land owners in the service areas.

Drainage of agricultural lands by the Bureau of Reclamation is usually done in conjunction with development of supplemental water supplies. The largest such project is the San Luis Drain serving the 552,550-acre Westlands Water District in California. Since the drain is being constructed with an interest-free loan, benefits are distributed in the same manner as land ownership within the service area of the drain. The method of charges for operating the drain and removing nitrates from the return flows has yet to be determined. If treatment costs are internalized using an effluent charge on individual emitters, no additional subsidy will occur. However, if nitrogen removal costs are determined to be nonreimbursable, a subsidy will be created and paid for by the general taxpayer.

In order to mitigate the effects of irrigation subsidies and to distribute these unearned benefits in a more equitable manner, the U.S. Congress in writing the original Reclamation Act of 1902 added the 160-acre limitation. This provision of the law limits delivery of water to any farm in excess of 160 acres in single ownership (320 acres in community property states). However, it does not limit the size of the operating unit in that leasing out by absentee landlords is not precluded. In these cases, division of the subsidy is a function of the relative bargaining power of tenants and landlords.

The Bureau of Land Management manages most of the balance of Federal-owned land outside of those managed by the U.S. Forest Service. Grazing permits are issued to livestock owners. As in the case of grazing permits issued by the Forest Service, to the extent that grazing fees are less than the long-run equilibrium value of these rights, a subsidy exists. The incidence of benefits from this program are directly proportional to the number of animal units grazed and the distribution of ownership of these livestock.

Programs of Corps of Engineers

Civilian activities of the U.S. Army Corps of Engineers have two main thrusts. First, flood control and second, improvement of navigation in harbors and inland waterways. In the Western States, dams sufficient in size to control flood flows often also store water which can be used for irrigation and power generation. The distribution of benefits and affects on the structure of agriculture are very similar to those emanating from the Bureau of Reclamation water development projects discussed above. Only the magnitude of the effects are reduced due to the smaller scale of the projects.

The benefits from flood plain protection in agricultural areas are in two forms. First, the increased productivity of flood plain lands which includes the growing of perennial crops where prior to flood protection measures the risk of loss was too great to warrant such investments and second, increased intensification of production or reduced loss of preproject cropping patterns. Flood control is a nonreimbursable cost. That is, project costs are not collected from project beneficiaries, therefore, any increase in agricultural income or reduction in loss is a windfall gain which accrues primarily to landowners. Although no data are available on

land ownership patterns in flood control project areas, it is reasonable to assume that due to the extensive nature of preproject cropping patterns in flood plains, farm sizes would be larger than average in these areas and, therefore, the distribution of benefits perverse.

The second major thrust of Corps civilian activities is the construction and maintenance of navigable rivers, waterways, and harbors. Affects of these activities on the structure of agriculture stems from their impact on transportation costs and the net economic advantage this may provide to certain geographic locations. Because no fees are charged, amongest other things, for the use of navigable rivers and inland waterways, transportation rates by barge are less than rail or highway freight rates. For those agricultural areas serviced by these waterways, such as the deep water ports at Sacramento and Stockton, California, Tulsa, Oklahoma, and the navigation locks on the upper Mississippi River, a net economic advantage is gained over other producing areas. Although transportation of bulk commodities is a small portion of total production and distribution costs, marginal resources within the area of benefit would be retained in the industry that would displace production in competing areas. That is, benefits accruing to the project region are offset by losses in other regions from a national viewpoint. The distribution of benefits would be in direct relation to the volume of the commodity transported by the subsidized waterways produced on the farms in the benefit region.

Programs and Policies of Department of Treasury

Policies and programs of the Treasury related to taxation have had an important bearing on changes in the structure of agriculture. The Internal Revenue Service policy towards farmers has been one of leniency, especially in the area of allowing the cash accounting method in calculating farm

income. The original argument in favor of cash accounting was that farmers as a whole were less well-educated and unable to maintain a sophisticated accounting system.

The ability to shift income and expenses between tax years through appropriate timing of purchases and sales benefits all farmers in general and due to the progressive nature of the tax structure, the larger the farm income, the greater the payoff at the margin.

Cash accounting and the policy which allows farm income losses to be offset against nonfarm income has attracted many nonfarm investors into "tax loss farming". Tax loss farms use several organizational forms, from the sole proprietorship where one investor purchases the entire farm to sub Chapter S -- small corporations that are taxed as partnerships and limited partnerships where the general partner assumes unlimited liability. The financial liability of the limited partner is limited to the amount of his financial investment -- similar to a stockholder in a general corporation. Limited partnerships are taxed in the same manner as a normal partnership.

The benefits of tax loss farming accrue primarily to high income nonfarm investors in direct relation to their marginal tax on nonfarm income. The direct effect on the structure of agriculture is in the form of additional bidders for a limited land resource supply where their maximum bid price for land is likely higher than that of a full-time farmer with agriculture as his sole source of income. The higher maximum bid price of the tax loss farmer and the high set-up costs for syndications in turn would create a greater incentive or pressure for farm size expansion resulting in larger than average size of farms among tax loss farms although no empirical data are available to verify this.

A second impact of tax loss farming can be hypothesized on the performance of these farms. The greatest opportunity for sheltering nonfarm income is in certain commodities such as beef breeding herds, and perennial crops, i.e., tree fruits and nuts and vineyards, where development costs can be offset against current nonfarm income but the asset appreciation is taken as a long-term capital gain.

It would appear that supply response in the short run for these farms may be quite different than that usually assumed for profit maximizing commercial farmers. For example, a tax shelter syndication formed as a limited partnership is generally promoted to nonfarm investors with the assurance that substantial losses will be shown in the development years and losses will continue to be shown through sequential development of additional acreage. Thus the syndicate is committed to a long-term land development program regardless of short-term market prices. For an individual farm whose output has no affect on market price, the effect of this behavior is nil. However, when a commodity with a relatively small market such as grapes, almonds, and other specialty crops becomes dominated by tax loss operations, then market price signals no longer allocate resources in the sector. In other words, investment capital may continue to flow to the sector in the face of declining prices accentuating an existing overproduction problem.

Eligibility or access to IRS policies such as cash accounting, sub chapter S, limited partnerships, and capital gains is open to virtually everyone in agricultural production. The ability to take advantage or utilize them falls on only a subset of the sector. The distribution of benefits from these policies would appear to be directly related to wealth, position, and the individual's marginal tax rate. That is, these policies lead to a perverse income distribution and create strong incentives for farm size expansion [4].

U.S. Department of Justice

Agricultural cooperatives receive preferential treatment under the Capper-Volstead Act. The Capper-Volstead Act provides the broad policy in support of farmer cooperatives. These cooperatives are active in both the input supply and marketing subsectors. There is no question that direct benefits accrue to small farms in terms of lower input supply prices and higher product prices than they would experience in the absence of cooperatives. Cooperatives operate as nonprofit firms with any savings being returned to members through patronage dividends. Only those dividends retained by the co-op are subject to taxation. In conjunction with the Bank for Cooperatives, the supply and cost of capital to co-ops places them in a strong competitive position vis a vis private commercial firms.

Agricultural producers who are members of the cooperatives benefit in direct proportion to their volume of sales to or purchases from these cooperatives. The larger the farm, the greater the total benefit which is a concentrating influence. Their second major affect is on the structure of the input supply subsector in changes they have caused in the marketing channels for commodities such as cotton, rice, citrus, milk, and to a lesser extent feed grains and wheat. In the food processing subsector, cooperatives have grown sufficiently in size to market national labels and influence the behavior of the large multiplant commercial processors. The net affect of the Capper-Volstead Act is probably in favor of decreasing concentration in the production subsector.

Antitrust Division of the Department of Justice and the Federal Trade Commission have had very limited activities in the agricultural production subsector concentrating their efforts on the inputs, processing, and retailing subsectors. One notable exception was the move against two large conglomerates attempting to integrate backwards into the fresh vegetable industry.

The activities of these two agencies is limited to enforcing laws prohibiting unfair trade practices and mergers and acquisitions which may reduce competition. They have little or no influence on growth internal to the firm which may ultimately change the structure of a sector. However, in their absence, structure of the sector would no doubt be significantly different than at present, primarily due to the availabiility of the Sherman and Clayton Antitrust Acts.

Tariff and nontariff restrictions on imports and exports are generally implemented by the U.S. Treasury although policy formulation and negotiations are conducted by USDA, Department of State, the White House, and Congress. An important example of import restrictions was the Sugar Act which limited sugar imports and allocated shares of the market among producing countries. The Act resulted in a domestic sugar price above equilibrium in order to maintain a domestic sugar production capacity. This price umbrella retained in agriculture otherwise submarginal sugar producers. Due to the widely scattered distribution of sugar production in the U.S., it would be a major task to determine the opportunity cost of this program. Other nontariff restrictions in 1968 [23] affected meat, tobacco, peanuts, wheat and coconut oil, cotton, and dairy products.

Tariff duties are levied on a large number of agricultural commodities imported into the country. In 1968, 264 pages were required to list all of the commodities and their by-products and the various applicable duties [22]. Although the government collects revenues from tariff levies, their major purpose is protection of domestic producers and the resources they employ. The degree of protection and, therefore, benefits from import quotas and duties is directly proportional to output of the producing firm. This has a concentrating influence.

Programs and Policies of Environmental Protection Agency

Most agricultural production and processing operations produce two types of outputs. First are the products for which the firm is organized and are sold through a market. Price signals to the individual firm are used in determining how and how much of these products to produce. These products can be termed "goods". A second set of products are produced jointly with these "goods" generally in the form of wastes which can cause damages or injuries to consumers and other firms. These "bads" generally do not pass through a market and, therefore, no price signals are available to firms and until recently had no effect on the how and how much of these "goods" or "bads" the firm should produce.

With the recent increased environmental concern expressed through State and Federal legislatures, the Environmental Protection Agency was formed to essentially cause the costs imposed on others by "bads" to be reflected back in the producing firms' production decisions. Environmental standards have been the primary method of internalizing these externalities. The firm then is allowed to choose[6/] the technology best suited to its own situation to minimize the cost of meeting these standards. Investment by the producing firms to meet environmental standards usually does not produce additional revenues and are nonself-liquidating and thus shift the average cost curve upward.

The incidence of the cost of internalizing these externalities in general is a function of output of the firm and the particular internalization policy in force. To the extent that economies of size exist in these pollution-reducing investments, a cost advantage will accrue to larger producers. For example, dairy farms and cattle feedlots are now required to meet solid waste disposal and water quality standards set by EPA.[7/] In some areas, this has necessitated livestock men investing in lagoons, and treatment plants not unlike those used for treatment of municipal sewage

with significant economies of size present. Water quality standards imposed on food processing plants also require high initial investments with rapidly declining average cost curves.

Pesticide safety standards add to grower and applicator costs in several ways. First, additional protective clothing and equipment, securing permits, and reporting of use are required in many states. In the pesticide manufacturing subsector, the additional costs of testing and registration have added large fixed costs to the introduction of new pesticides and to the re-registration of old ones.

Air quality standards have affected the input, processing and in some regions of the country, the agricultural production subsector. In all subsectors, additional costs have been imposed on these firms the precise effect on firm cost curves varying widely from commodity to commodity and subsector to subsector. The general tendency, however, is to place the subregions with closed air drainage basins in a poorer competitive position giving an impetus to a shift in the location of production. To the extent that some states, such as California, who have prescribed environmental standards more strict than Federal standards, the change in structure will probably be more rapid.

Policies of Interstate Commerce Commission

Location of production was included within the definition of structure. The Interstate Commerce Commission sets freight rate schedules for trucks and railroads. Although most of the truck movement of agricultural commodities are unregulated, rail rates for bulk shipment of wheat and feed grains can have an effect on the location of production and processing and returns to resource owners [25]. Feed grain deficit regions such as the East and the Pacific Southwest are heavily dependent upon imports from the surplus producing areas of the Midwest. Assuming that feed conversion

rates are approximately equal in the two deficit regions, a small change in freight rates for grain, live cattle, and carcasses will tip the balance of economic advantage as to where these commodities will be raised and slaughtered, see King and Logan [11].

A second locational effect within the power of ICC is approval of applications to abandon rail lines. Although it is not expected to have a broad impact on the location of agricultural production, affected rural towns will be at a cost disadvantage with respect to transportation costs, especially for bulky items such as fertilizer and grain.

U.S. Monetary Policy

The exchange rate of U.S. dollars for foreign currencies has been a long neglected variable in assessing the changes undergone by U.S. agriculture. Schuh [19] in a recent article analyzes the effects of the overvaluation of the dollar on exports and its importance in inducing technological change. In his paper, Schuh sets forth four propositions: "(1) that an important share of the income problems of U.S. agriculture in the post World War II period was a result of the persistent overvaluation of the U.S. dollar which resulted in an undervaluation of our agricultural resources in relation to their world opportunity costs; (2) that the stress caused by this undervaluation forced a more rapid rate of technological change than would otherwise have been obtained and this in turn aggravated what would have in any case been a serious adjustment problem; (3) that the overvaluation of the dollar resulted in a larger share of the benefits from technological change being channeled to U.S. consumers than would have occurred with an equilibrium exchange rate; and (4) that the sizable devaluations of the past two years and the movement to essentially flexible exchange rates constitute important structural changes for U.S. agriculture and the U.S. economy" [19, p. 2].

Money market operations of the Federal Reserve Bank have a strong influence on short-term interest rates and some influence on long-term interest rates. Farmers have traditionally favored expansion of the money supply and low interest rates. Tight money supplies and high interest rates have led commercial lenders to ration credit and demand greater collateral from borrowers. Due to the high capital requirements per worker in agriculture as compared to other industries, these policies have worked to the detriment of small farmers wishing to adopt new technological innovations and expand land resources. It can be hypothesized that large farms with stronger wealth positions, economies of size, and larger cash flows are able to bypass local country banks and secure more adequate financing than their smaller counterparts. Further, during a credit crunch, small farms, cut off from their usual sources of bank credit, are forced to seek operating funds from retailers and small loan companies paying significantly higher interest rates, placing them at a cost disadvantage.

Policy Implications

Nontechnological programs and policies of the Federal Government, even those not directly targeted towards agriculture can and do have implications for the future structure of agriculture. Only a few of the existing programs and policies are specifically directed towards retarding or reversing the trend of larger and fewer farms, or firms in the input or processing subsectors.

Certain states have enacted laws limiting agricultural operations by specific types of business organizations. Specifically, these laws have been directed towards the corporate form of organization and alien investments. However, as we have attempted to demonstrate, there are many other forces operating to increase the average firm size and to concentrate on one organizational form or one commodity would be a case of treating the symptoms and not the disease.

Conclusions

An attempt has been made here to sharpen the focus on a large number of nontechnological programs and policies of the Federal Government and their effect on the structure of agriculture. In a qualitative assessment, we have argued that these programs and policies have had an important influence and further the cumulative affect over the past 40 years has been second only to technological change in shaping the current organization, location, and distribution of income in the agricultural sector.

FOOTNOTES

1/ Many of the commodity programs contained provisions which gave preferential treatment to very small farms such as the cotton program in the early 1960's which set a minimum acreage allotment of 15 acres. In the 1970 feed grain program, preference on diversion payments was given to farms with a base of less than 25 acres. Although a large number of farms were affected, the overall redistributional effects were minimal.

2/ The more closely the Gini or concentration ratio approaches 1, the more unequal is the distribution of benefits.

3/ It should be noted that under a perfect market for land, all the gains from commodity programs would be imputed away.

4/ Schuh points out elsewhere that high nonfarm wage rates during this period were also a strong factor in the shift of labor out of agriculture.

5/ Although in the past two years the Bureau has revised its water pricing policy to more nearly reflect project costs, the subsidy is "locked in" to old projects through long term water delivery contracts.

6/ A major exception to this is P.L. 92-500 which stipulates best practical technology be utilized in meeting 1977 environmental quality goals.

7/ For certain wastes, very small producing units are exempt from these standards.

FOOTNOTES:

1/ Many of the commodity programs contained provisions which gave [illegible] treatment to very small farms such as the cotton program in the 1960's which set a minimum acreage allotment of 15 acres. In the [illegible] grain program, preference on diversion payments was given to farms [illegible] a base of [illegible] than 25 acres. Although a large number of farms were [illegible], the overall redistributional effects were minimal.

2/ The more closely the Gini or concentration ratio approaches 1, the [illegible] is the usual is the distribution of benefits.

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4/ Schuh points out elsewhere that high nonfarm wage rates during [illegible] were also a strong factor in the shift of labor out of agriculture.

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