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U.S. Farm Programs and Agricultural Resources

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In this report...*"What is the effect of U.S. agricultural support programs on land, input use, and production in agriculture?" U.S. agricultural support programs have a greater effect on land and other farm inputs than on commodity production. Commodity programs have increased land values and encouraged the substitution of other inputs such as farm chemicals for land. Agricultural support programs raise total farm income, but in their absence, commodity production would decline, prices would rise, and the mix of crops would change as program crop producers shift to other crops.*

Government support to agriculture has been substantial in recent years. Direct Government payments averaged 38 percent of net farm income from 1982 to 1985. From 1985 to 1987, such payments averaged 30 percent of net farm income. These payments affect the choice of inputs used in agriculture as well as crop production and prices. Farm programs induce production resources to remain in the sector and inhibit resource flows, both to other sectors of the economy and between crops covered by programs and crops not covered. Government incentives have kept resources in farming and have resulted in surplus production and inefficiency in the sector.

Land, the main resource used in farming, shows the most significant effects from farm programs. Because the benefits of commodity programs tend to be capitalized into land values, the returns to land and land values would be substantially lower in the absence of price supports for program crops. Land tends to be used more intensively as a result of farm programs. For example, producers might use more fertilizer and machinery to improve yield. Acreage reduction programs give producers incentives to substitute agricultural chemicals and other inputs for land. In the absence of farm programs, the longrun production of program crops would be lower and their market prices higher, and the overall crop mix would change. These commodity effects are important but much smaller than the effects on land.

Effects of U.S. Commodity Policies on Agricultural Resources

Price supports cause total agricultural production to increase, input use to rise, and commodity prices and returns to factors of production except land to be slightly lower. Acreage reduction programs (ARP's) lower total output, restrict land use, and put upward pressure on land values.

With Farm Programs...

- Farm resources are less mobile; they tend to be tied to the production of specific crops by artificially raised returns and acreage restrictions.
- Total production is slightly higher, resulting in lower prices for program crops and livestock.
- Land values are higher.
- Variable inputs, such as chemicals, substitute for land.
- Total farm income is higher.

Farm Programs Directly Affect Commodity Markets, Input Allocation, and Farm Income

Farm programs inhibit the flow of resources between program and nonprogram crops and to other sectors of the economy, which can lead to the inefficient allocation of resources.

By keeping farm returns artificially high, farm programs have kept resources from moving freely from agriculture to other sectors of the economy. The flow of resources among particular crops has been restricted as well. An inefficient allocation of resources results. Inputs used in farming earn a market rate of return below what they would earn elsewhere, but the additional return provided by farm programs offers an incentive for the resources to remain in farming. Farm programs that are meant to improve returns for the farm sector actually may diminish farming's potential market returns by preventing resources from flowing freely between sectors or crops to their most efficient uses.

Commodity policies are aimed primarily at price stabilization and income support, but their effects are reflected largely in higher land values. Shortrun, policy-induced income gains are offset as the sector adjusts through capitalization of Government payments into asset values. Capitalization is a process that converts expected program benefits into land values. Capitalized Government supports create inequities between existing and entering farmers by increasing new farmers' cost of purchasing land. Commodity programs that restrict land use and raise land values also attract land-saving and yield-enhancing technological changes, leading to more intensive use of cropland.

Background on Commodity Programs

Government support of agriculture has a long history stemming from the farm programs enacted during the 1930's. Commodity programs now cover food and feed grains, cotton, peanuts, tobacco, soybeans, dairy products, sugar, wool, and mohair. The basic objectives of farm policy are to supplement farm income and stabilize prices. These goals are achieved with programs that support prices and manage supply. Programs for food and feed grains support market prices through nonrecourse loans and supplement income by establishing target prices that partially determine direct payments to producers.

In an attempt to make the farm sector more market-oriented, the 1985 Food Security Act lowered price support levels. The 1985 Act also established programs to encourage soil conservation and improve water quality.

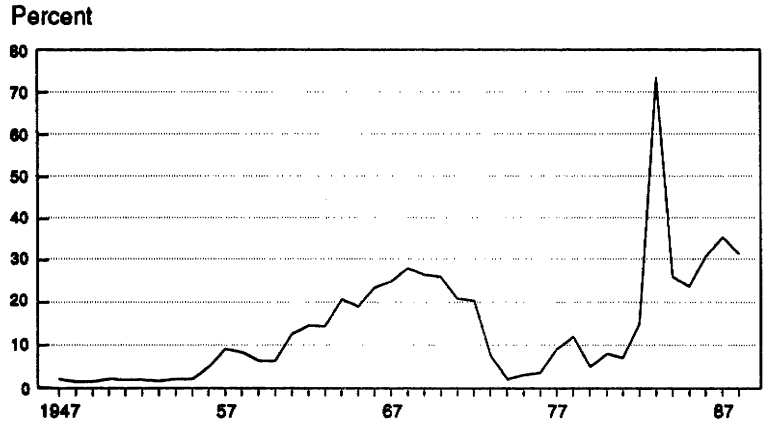
Current Farm Policy Goals and Programs Include...

Supporting Prices:	*Supplementing Income:*	*Managing Supply:*
Nonrecourse loans	*Target prices*	*Acreage reduction programs*
Farmer-owned grain reserve	*Marketing loans*	*Paid land diversion*
Commodity purchases	*Disaster payments*	*Acreage allotments*
Marketing orders	*Crop insurance*	*Marketing orders*
Import quotas	*Marketing quotas*	*Dairy herd buy-out*

Farm Programs Have Raised Farm Income

Figure 1
Direct Government payments as a percentage of net farm income

Payments are low when market prices are strong but are higher when commodity prices are low.

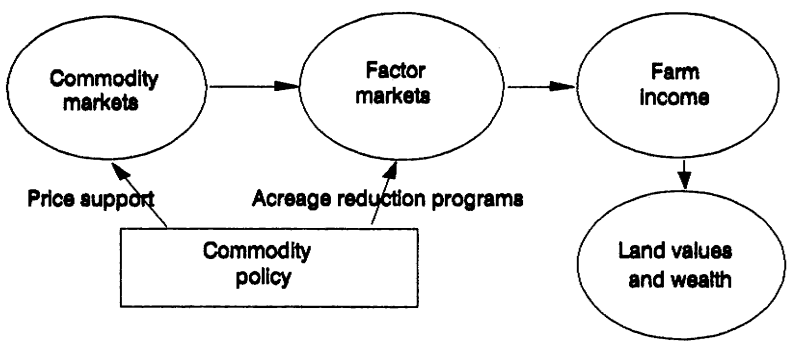


- Government payments are intended to stabilize income. Payments as a percentage of farm income are low when market prices and export markets are strong, such as during the 1970's, but are high when commodity prices are low.
- In the 1960's and mid-1980's, direct farm payments were a substantial share of net farm income.
- Government payments as a percentage of net farm income were highest under the 1983 payment-in-kind program.
- Payments have averaged 30 percent of net farm income during the last 5 years.

Programs Influence Markets for Farm Inputs and Commodities

Figure 2
Links between programs and markets for farm inputs and commodities

Price supports and acreage restrictions affect production decisions and lead to higher farm income and land values.



- Commodity programs directly affect commodity markets through price supports.
- Price supports affect production and input allocation decisions.
- Commodity programs directly affect factor markets through acreage reduction programs.
- The effects result in higher farm income and land values.

Effects of Commodity Programs

- *Shortrun income gains are temporary.*
- *Government payments are capitalized into land values.*
- *Government-induced factor returns cause misallocations of factors among crops.*
- *Factors are misallocated among other sectors of the economy.*
- *Increased land values raise costs for new farmers.*
- *Higher land values encourage adoption of land-saving and yield-enhancing technological change.*

Land Values Are Higher With Programs

Commodity program benefits tend to be capitalized into land values, so that in the long run, land values rise due to farm programs.

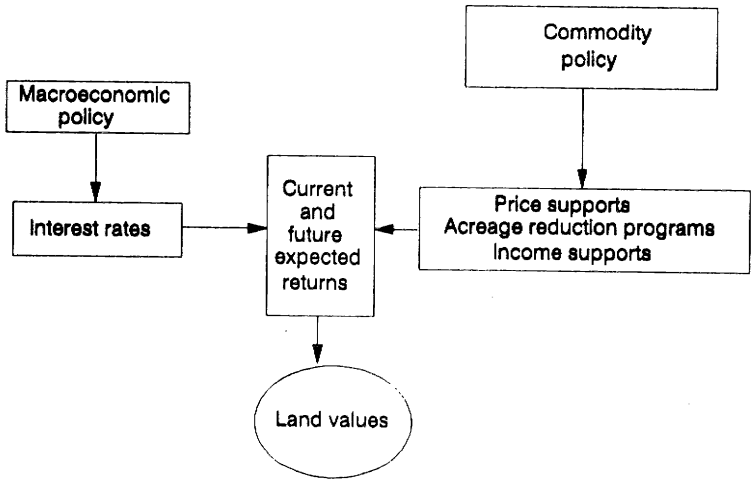
Land is the largest component of wealth in the agricultural sector. Farmland values are higher under farm programs because the benefits from commodity programs are capitalized into land values. The value of land is largely determined by the amount of income it can produce. Government programs, which augment that income, increase land values and landowners' wealth.

Acreage control programs add to this upward pressure on land values by decreasing the effective supply of land, thus raising the scarcity value of land. The benefits of acreage control programs tend to accrue to landowners rather than to providers of labor or capital, essentially because farmland supply cannot easily be increased. Because of farm programs, acreage is taken out of production, which decreases the effective supply of land and raises land's scarcity value.

The most significant effect of domestic agricultural policy is on the value and use of farmland. The change in land values is a good measure of the economic impact of agricultural policy on the agricultural sector. In the absence of farm programs, longrun equilibrium land values would be lower (by about 15 to 20 percent), because Government payments would be lost.

Figure 3
Links between land values and farm programs

Land values are affected by Government programs.



- Land values are determined by the expectation of future returns.
- Farm programs have contributed to an increase in farm income.
- Macroeconomic policies that influence interest rates also affect land values.
- Any reduction in farm programs would reduce land values.

Commodity Programs Increase Land Values

- *Government payments are capitalized into land values.*
- *Acreage restrictions increase scarcity value of land.*
- *Without programs, land values would be 15-20 percent lower.*

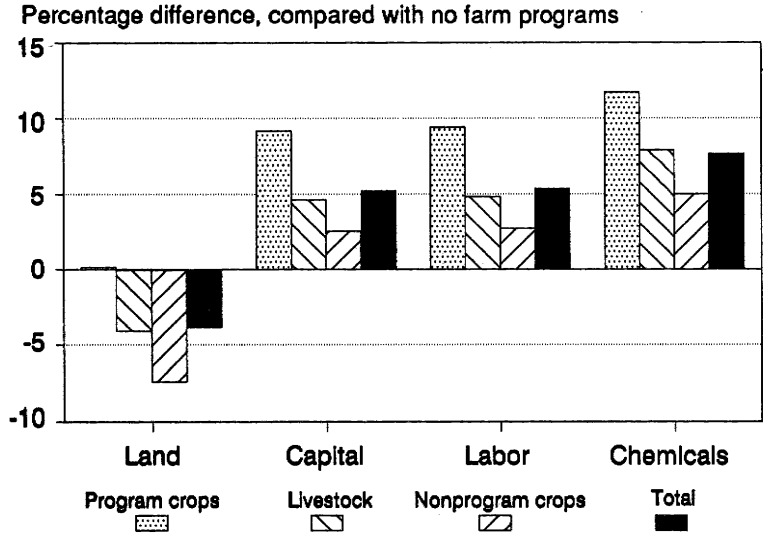
Farm Programs Increase the Use of Chemicals and Other Inputs

Under farm programs, land is used more intensively, with more agricultural chemicals and other inputs used per acre. In the absence of farm programs, producers would substitute land for chemicals and other inputs.

Because land is relatively more expensive than other inputs, farmers increase the per acre use of variable inputs, resulting in land intensification. If commodity prices were freely determined by markets and acreage controls lifted, farmers would adjust by reducing the use of inputs other than land, changing production patterns, and cutting overall production. Such a result is referred to as land extensification and would, at least partially, reverse the historical trend toward more intensive use of chemicals and machinery. Falling land values also would lead to the substitution of land for chemicals, capital, and labor.

Figure 4
Input use with farm programs

Acreage reduction programs reduce land use but increase the use of other inputs.



- Total land use is lower because of acreage controls.
- The use of nonland inputs (capital, labor, and chemicals) is higher because of the substitution of other inputs for land.
- The use of nonland inputs increases more for program crops than for nonprogram crops and livestock.
- Amount of overall substitution depends on relative input costs.

The Effect of Farm Programs on Input Use

- *Less land is put into production.*
- *More nonland inputs are used.*
- *Chemical use is higher.*

Crop Mix Different as a Result of Commodity Programs

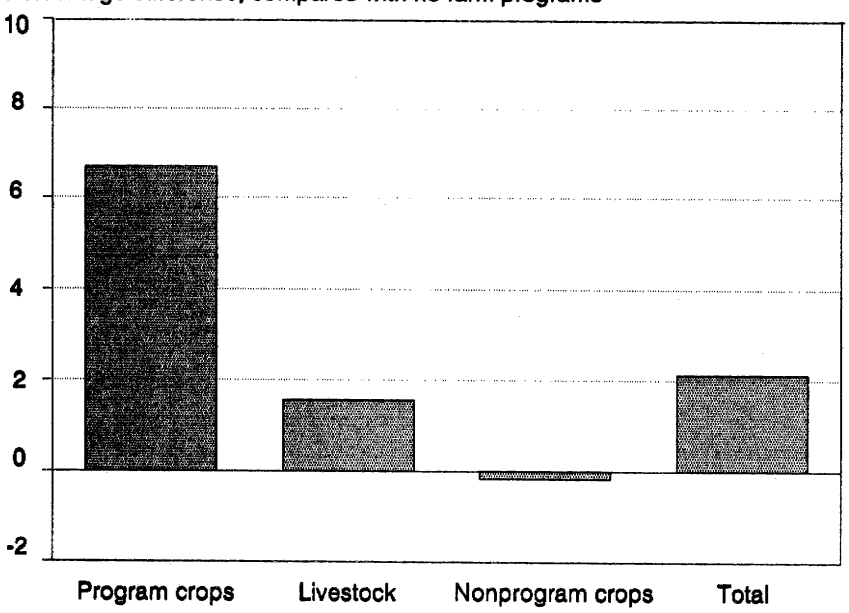
Even though commodity programs are designed to affect commodity markets, they have relatively minor effects on crop production and prices, and more significant effects on the crop mix.

Land retirement programs reduce production while price supports encourage production of program crops. Commodity programs provide production incentives divorced from market conditions. The program incentives induce more output than might result if production were driven strictly by market prices. In the absence of commodity programs, more land would be in production because there would be no acreage reduction programs, but farmers would have less incentive to produce program crops.

Agricultural output would be slightly lower (about 2 percent) with market-generated prices. Shifts in production among program and nonprogram crops and substitution between land and nonland inputs influence prices and outputs. In the absence of farm programs, corn producers would shift to soybeans, increasing the supply of soybeans and depressing their price. Production of program crops would be lower, while nonprogram crop production would expand slightly. Livestock production, including dairy, would be slightly lower.

Figure 5
Production with farm programs

Overall production is higher with farm programs, although production of nonprogram crops is lower.



- Program crop production is higher.
- Nonprogram crop production is marginally lower.
- Overall production is higher.

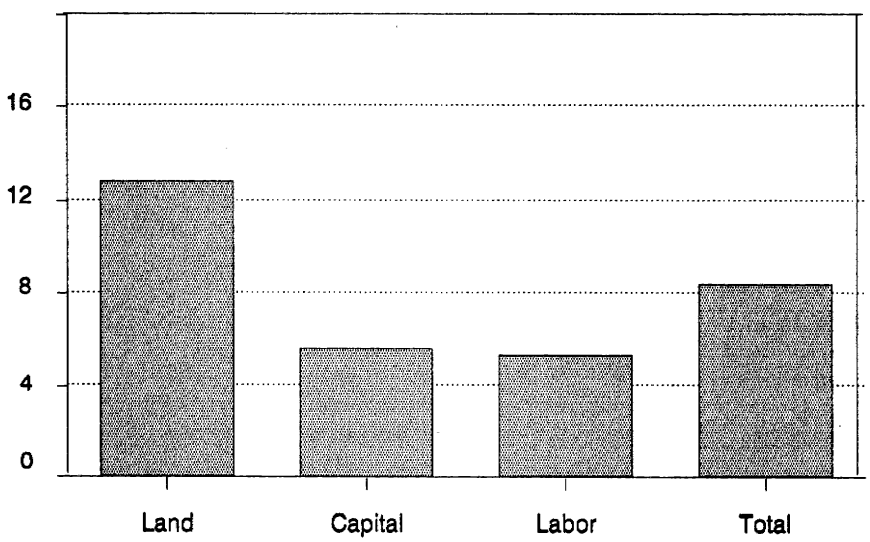
Farm Income Is Higher With Farm Programs

Government payments to the farm sector increase total farm income.

Direct Government payments in 1988 constituted approximately 32 percent of net farm income. In the absence of farm programs, producers' income would fall, but not by the entire 32 percent. Farm income would be only about 8 percent lower due to the relocation and adjustment of factors. That is, without the distortions to production induced by the programs, farmers, on average, would produce more efficiently, lowering the average costs of production. In the absence of these programs, there would be fewer farmers, but those with strong balance sheets would remain and consolidate the remaining farmland.

Figure 6
Payments (wages, rents) to factors of production (labor, land) with farm programs

Land accounts for the largest share of returns to the agricultural sector.



- Total returns in the farm sector are higher because of the presence of Government payments.
- Less land is used, but it earns more under farm programs.

Substitution Among Inputs Plays a Crucial Role in Determining the Effects of Farm Programs

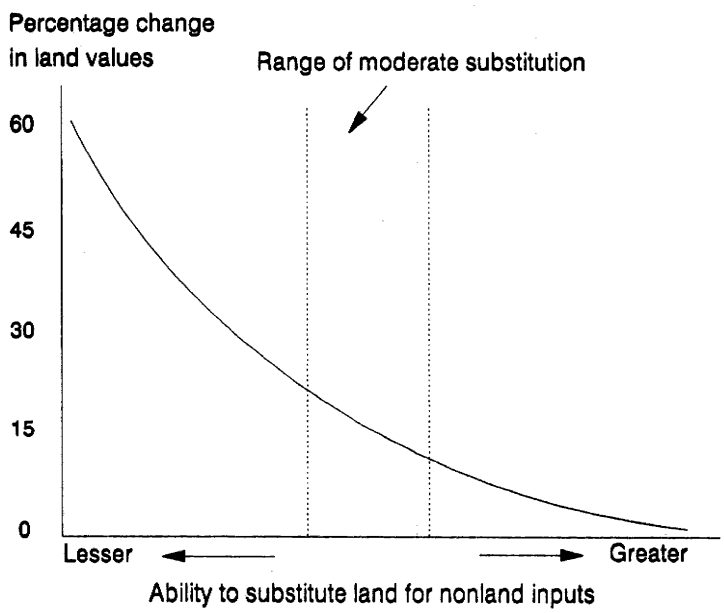
The effect of farm programs on land values, output, and input use depends on the degree to which farmers can change production patterns by substituting land for other inputs.

Over time, farm programs have created a pattern of input use, production, and land values that would change in the absence of these programs.

If farmers have limited substitution possibilities between land and nonland inputs, in the absence of farm programs, total production would increase as land formerly under acreage controls re-enters production. Higher production would cause large declines in commodity prices and farm income. Falling income would result in a decrease in land values and a loss of financial equity in the agricultural sector, which would cause financial restructuring in the sector. If farmers have greater substitution possibilities that allow more flexibility in production, declines in farm income and land values would be moderated.

Figure 7
Land values and input substitution with and without farm programs

Land values are sensitive to the degree of input substitution.



- High levels of substitution imply farmers can easily substitute one input for another and maintain output.
- Limited substitution opportunities imply that land values are very sensitive to changes in Government programs.
- Government support could add as much as 60 percent to land values if farmers are unable to substitute other inputs for land.
- Because most farmers have substitution possibilities, Government programs add only 15-20 percent to land values.

Substitution Between Land and Nonland Inputs Affects Farm Sector Adjustments

- *Substitution between land and nonland inputs determines the effects on output and input use.*
- *Land values show largest changes when substitution possibilities are most limited.*
- *Greater substitution possibilities imply moderate changes in output and input use in response to Government programs.*

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Analytical Approach and Assumptions Used in This Report

- *Effects of domestic commodity programs are analyzed using a computable general equilibrium model (CGE), which depicts the longrun aggregate response of agriculture and other sectors to various policies.*
- *The U.S. agricultural sector is split into program crops, livestock, and nonprogram crops in the model.*
- *Separate output subsidies are incorporated into the model for both program crops and livestock.*
- *Assumptions concerning output subsidies and land set-aside use 1984 as the benchmark.*

For More Information...

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