Many economists have presumed that the benefits of commodity programs accrue entirely or almost entirely to landowners, but others have questioned that presumption. Alston and James (2002) state: “The conditions under which all of the benefits from an output subsidy accrue to landowners are extreme, but may be appropriate at some level of aggregation” (p. 37). They argue that analysts err by assuming too readily that land is fixed in supply while other inputs have fixed prices (are perfectly elastic in supply), an especially egregious error for individual commodities that use far less than the aggregate supply of cropland.

The classical model for analysis of income distributional consequences of commodity policies is Floyd (1965). In his model of a single output and two inputs, the input-price effect resulting from producer price support via a production subsidy is:

\[
\frac{EP_a}{EP_x} = \frac{\sigma + e_b}{\sigma + K_a e_b + K_b e_a}
\]

where \(P_a\) and \(P_x\) are input and output prices, \(E\) is the elasticity (percentage change) operator, \(\sigma\) is the elasticity of substitution between the two inputs \(a\) and \(b\), \(e_a\) and \(e_b\) are the own-price elasticities supply of each input, and \(K_a\) and \(K_b\) are their shares in total costs. The changes in the relative price of the two inputs are related according to:

\[
\frac{EP_a}{EP_b} = \frac{\sigma + e_b}{\sigma + e_a}
\]

From equation (1), letting land be factor \(a\) and nonland inputs be factor \(b\), if nonland inputs are perfectly elastic in supply (available at prices determined outside the agricultural sector at given prices), we have \(EP_a/EP_x = 1/K_a\). If \(P_x\) is increased 10 percent by a policy and land’s share is 1/3, then the (rental) price of land rises 30%, i.e., exactly enough to capture all the benefits of the higher commodity price.\(^1\)

But it is expected that typically some nonland inputs will not be perfectly elastic in supply, and land and nonland input supplies will divide the benefits in the proportions given by equation (2). Still with land relatively inelastic in supply we may expect landowners to reap the benefits disproportionately.


\(^1\) Note however that land being perfectly inelastic in supply (\(e_a = 0\)) is not sufficient for land to capture all the benefits, except in the special case of fixed proportions (\(\sigma = 0\)). The reason is that land, even if fixed in supply, is not a binding constraint on production when other inputs can substitute for land.
A tricky and too often neglected aspect of the economic analysis of policies is specifying appropriately how actual policies apply. Several types of policies are relevant:

--Production subsidies. If payments are tied to current production, we get classical incidence as in equation (1). This is relevant to current policy as Loan Deficiency Payments, as discussed further below, are paid on the quantity of output that the producers declares.

--Deficiency payments tied to acreage reduction. From the 1960s to the 1996 FAIR Act, payments to producers have typically been tied to the producer’s agreement to idle a portion of the cropland receiving payments. Such set-aside, or acreage reduction programs, have considerably different consequences for land and other input prices than equations (1) and (2) suggest. Here there are three elements of landowners gains: the payments themselves, which are tied to a land base, the rental value of land foregone on idled acreage, and the rise in the relative price of land relative to other inputs caused by idling land. It is possible for land to receive substantial gains, especially if the demand for land as an input is inelastic (because substitutability between land and other inputs is low). But the requirement to idle land is a substantial additional cost.

--Decoupled payments. In the context of current programs, Barnard et al (2001) discuss the difference between Loan Deficiency Payments (LDPs) and Production Flexibility Contract Payments (PFCPs) under the 1996 FAIR Act as follows. “Because LDPs are paid on each unit produced, farm operators have an incentive to increase production through greater use of fertilizer, herbicides, and other inputs. As a result, input suppliers capture a share of LDP benefits, and consequently, LDPs may have a lesser effect on cropland values than PFCPs and other decoupled, lump-sum payments” (p. 27). The LDPs are classical production subsidies so equation (1) applies. But that is not the only reason why landowners don’t get all the program benefits. In addition the use of land and nonland inputs induced by LDPs increases commodity output, and this causes market prices of the supported commodities to be lower than would be the case without the programs (as foreign producers of these commodities like to remind U.S. policymakers). The practical point for gainers from payments is that buyers of the commodities share in the gains. For example, if the elasticity of product supply equals (in absolute value) the elasticity of product demand, then gains from the subsidy will be shared equally between buyers and input suppliers, and the gains to landowners and other input suppliers would be just half of what equation (1) indicated.

For PFCPs the analysis is different because, if truly decoupled, the policy has no effect upon output, or upon product or input prices. Whoever gets the payment gets an income increase equal to the payment, as a first-order approximation. Second-order effects involve price effects of payment recipients’ choices of how to use the increase in income that the payments provide. A farmer might invest in the farm, but instead might invest in financial assets or spend more on consumer goods. The key point is that the

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2 For details on how these factors add up, see Gardner 1987, Chap. 4.
payment itself provides no more incentive to use PFCPs to increase production on the farm than would be the case for any other lump-sum cash infusion.\(^3\)

With respect to landowner gains, the issues are (i) what determines who gets the payments: eligibility criteria for participation and the amount for each participant, and (ii) how contractual arrangements change once payment eligibility is determined. For FAIR Act PFCP payments, eligibility is tied to land at a particular location that has grown program crops in 1991-95, and the amount of payments is tied to a quantity taken to have been produced for program purposes on that land (typically different from the quantity actually produced). Does this mean the payment has to end up increasing the income only of the owner of payment-receiving plots?

A complicating issue is requirements, such as current law contains, that payments must be shared between landowners and tenants, in the case of crop sharing contracts, or be paid to cash renters if they are the active farmer. Ryan, Barnard, and Collendar (2001) report testimony of a panel of farm managers that with cash rentals, terms of leases are negotiated with “lease rates being bid up until the landowner had captured most of the tenant share of the PFCP” (p. 23). With crop-sharing contracts the issue is more complicated in that PFCPs are supposed to be shared in proportion to crop shares. If the terms of such leases are not adjusted, the landowner will not reap the full benefits (which is the apparent legislative intent).

Might payment limits make a difference? If actually enforced, they could result in some otherwise-eligible land not receiving payments. But even if this happens, it is not the case that some other economic interests in production would get the benefits – the benefits would still go to land only.

The debate on payment limitations shows the inevitability landowners getting the benefits as Congress sees the issue. In the April 20 House-Senate Conference Committee meeting on the 2002 farm bill on April 20, 2002, it was argued, and no one disputed, that owners of cropland who are not active farmers (identified as farmers’ widows in that debate) would be “forced” to cash rent if legislation impaired their ability to capture payments through payment limits or restrictions on crop-sharing contracts. The analytical point is acceptance of the proposition that under cash rental, the rent paid to the landlord will inevitably contain the program benefits as long as there is competition among renters for leased land.

Is there an alternative under which PFC payments would not accrue to landowners? Yes. Eligibility for payments could be tied to the bushels grown by a person in the base period, each grower identified by name, and the relevant person in the case of cash rental is legislated to be the renter. If that renter chooses to move to another landlord, the payment moves too. Then the tenant would retain the payment and land

\(^3\) This statement pertains to PFC and market loss assistance payments under the FAIR Act. The 2002 farm bill creates different incentives by regularizing these payments and updating payment bases. The updating generates a production incentive by signaling that a farmer’s future legislated payments are likely to be a function of that farmer’s production in the years leading up to the legislation.
rents or prices would not be increased. Any examples of this approach? Occupational licensing is closest.

**Empirical Evidence**

There are several ways to marshal evidence on the effects of commodity programs on land values. The choice among them depends in part on the question being asked. The central question is: how much lower would the value of U.S. farmland be in the absence of U.S. commodity programs, everything else remaining the same? Two important variants of the question are: (a) what would be the effects on land values in 2002 if we removed the programs in 2002 (as some once hoped the 1996 FAIR Act might entail), and (b) how much lower would land values be in 2002 if we had never had commodity programs. Question (b) looks impossible to answer because to answer it properly we would have to have an accurate econometric history of U.S. agriculture since the programs began. Question (a) looks simpler but it raises many questions of expectations and time to adjust. The substantial literature on the econometrics of land values has had considerable difficulty sorting out the dynamics of land price determination, especially when land value is determined not only by its present and future expected rental returns in agriculture, but also its value if converted to nonagricultural use and the range of macroeconomic factors (mainly inflation and interest rates) that influence the valuation of land as a financial asset.

US average land values. The average value of farm estate fell in real terms after 1910 until the mid-1930s, was then was essentially flat for two decades, after which real prices have generally risen since 1950 (Figure 1). What plausible linkages are there

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4 It might be thought that land would ultimately benefit because in order to participate the grower needs access to land. But this is no different from needed fertilizer, seeds, or other inputs. The question for land’s gains, as for other inputs, is whether the demand for them is increased or not. For PFC payments, the recipient gets the same payment no matter how much is produced so there is no incentive to use more inputs.

5 Throughout this paper I refer to land or real estate values rather than land prices. The data used are from the Agriculture Census and corresponding USDA surveys. These data are derived from surveys in which farmers are asked their estimate of what their farm (land and buildings) would sell for. Thus the data are not market prices. They may over- or under-estimate average market prices of farm real estate; the assumption in comparing these data over time or locations as that farmers tend to over- or underestimate the value of their farms, if they do, in a consistent way.
between this story and U.S. commodity programs? The New Deal was introduced in 1933, but if it resulted in any significant capitalization of rents into land values during its first decade, that is not apparent. The idea of a relatively minor role of the programs is suggested by the existence of one major episode of land-value changes, the commodities boom and bust of the 1970s and 1980s. This was a market-driven event. One does not see land value changes anywhere near this substantial that are plausibly attributed to commodity programs. But maybe the turnaround from a long-term trend of declining real farmland values to a rising trend in the post-World War II period is in part attributable to the existence of commodity support (so that if the support had been absent, land values might have continued to fall)? Econometric studies of time series of farmland prices have not found solid empirical evidence of farm program effects on land prices. Indeed,
Figure 1. Real Farmland Value and Rent

Iowa Cash Cropland Rent (right)

Iowa Farm Real

U.S. Farm Real

1992 $ per acre (cash rent)
the tenor of these studies, a recent example of which is Just and Miranowski (1993), is that macroeconomic variables are the dominant explanatory factors in changes in U.S. farmland values. A particular difficulty in estimating program effects in time series data is that payments fall in the periods when market prices are high (like the 1970s), which are the periods when farmland prices rise most. In this situation one needs to hold the relevant underlying market conditions constant in order to identify program effects, a task not yet accomplished in empirical work to my knowledge.

Disaggregated land values. We could look for effects of commodity policies cross-sectionally using data on land prices on different farms where policies affecting those farms are different. The analysis would be like estimating the land price effects of irrigation by observing the values of irrigated and unirrigated acreage. However, the situation is more complicated for commodity policies. First, for policies that support market prices, such as the sugar program for example, all land that grows the supported commodity, which is likely to be all the comparable land in any particular region, will be affected in the same way, at least to a first approximation. So we do not have the necessary contrast between the policy and its absence. Of course we will always find some landowners not enrolled in a program, but if the market price is supported, that land will reap benefits anyway. Moreover, even if a particular farm does not grow the supported commodity, but could if the owner chose to, the market value of the land will reflect that option and so be affected by the support program.

Second, if the program is one that makes payments but does not support market prices, as is the case for current production flexibility contract payments, market loss assistance payments, and loan deficiency payments, land values in an area will be affected even for nonparticipants if they could choose to participate. Participation-tied payments is the situation for most of the U.S. commodity programs since the 1960s.

Nonetheless, there is a real contrast between participating and nonparticipating farmland, which can reasonably be hypothesized to be at least in part attributable to characteristics of the location (soil quality, climate, distance from markets). If the differences are only ones of comparative advantage (so that in the situation of no commodity programs, land at different locations would grow different crops but on average would have the same value) then comparing land values at locations with and without program coverage would provide an estimate of the effects of commodity programs on land values. But if land at locations without commodity programs would have lower value even if there were no programs (the counterfactual situation we cannot observe) then we cannot use the difference in land value between the two locations to estimate the effects of programs.

An econometric approach to these problems is to attempt to hold the non-program factors that make land at two locations differently valuable using a standard regression model, and see how much of the residual differences can be explained by variables pertaining to commodity programs. The difficulties as usual involve getting appropriate observations, data that measure both policies and the relevant non-policy variables that
influence land values, and estimating effects of policies on land values rather than effects of other variables (omitted variables correlated with land values) on policies.

A notable recent effort to estimate program effects cross-sectionally is that of Barnard, Nehring, Ryan, and Collendar (2001). They explained the value of farmland per acre at the county level, as reported by farm operators in the 2000 Agricultural Resource Management Survey (ARMS) conducted by USDA. The approach was regressions explaining land value per acre as a function of commodity program payments received, soil quality, availability of irrigation, urban influence, and other factors not specified in the report (Ibid., p. 28). They estimate that $61.6 billion of the $312.3 billion value of land harvested for eight program crops (wheat, corn, soybeans, sorghum, cotton, rice, barley, and oats) was attributable to program payments. Since payments received in 2000 for these programs amounted to about $21 billion, it appears that each $1 of payments generates about $3 of land value. But of course we don’t expect that the current level of payments is the source of all program effects on land values. For one thing, as Barnard et al note, in 2000 a larger proportion than usual of payments was made up of LDPs, and these would be expected to have a smaller effect on land values than PFCPs because LDPs have the additional effect of causing lower commodity prices. More broadly, land values are expected to reflect not the current year level of payments, but discounted expected future benefits. The observational basis for farmers’ expectations about these benefits is not only current payments but recent past payments and commodity market conditions underlying forecasts of future payments.

To take a related but independent approach to empirical evidence, I use a sample of 315 counties observed over a longer time period. The counties are non-contiguous and far enough apart to represent arguably distinct land markets. Each is near the center of a “state economic area,” a classification developed by the Bureau of the Census in the 1940s. In nonmetropolitan areas these areas coincide with “type of farming” areas defined by the USDA and used in the 1950 Census of Agriculture. Their number varies widely by state, depending on the size of the state and variety of agriculture within it.

Estimating a an OLS model similar to that of Barnard et al on these data provides some evidence of effect of payments per acre on a county’s average farmland value per acre, but not a quantitative estimate in which one can be confident. The scatter diagram of payments per acre and average county farmland value is shown in Figure 2a. The simple least-squares regression line shows a positive effect, but the fit is poor, and one may reasonably question whether this association between payments and land prices shows results of commodity program support. The very high land-value counties are

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6 This calculation is crude, and due to me not Barnard et al. USDA reports all government payments received by farmers in 2000 as $22.9 billion. But about $1.8 billion is received through Conservation Reserve Program and other environmental programs, and some payments are made for programs other than the eight major crops. CRP payments arguably do not increase land values nearly as much as PFCPs because the farmer is essentially renting the land to the government and foregoes the returns from growing crops on that land. So a farmer may increase the farm’s value only marginally, perhaps not at all, by enrolling it in the CRP.

7 For example, current USDA and outside forecasts are for commodity prices to gradually increase over the next decade, a trend which would generate smaller program benefits in the out-years.
Figure 2a. Government Payments per Acre and Land Value, 315 Counties, 1992

Figure 2b. Government Payments per Acre and Land Value, 92 Rural Counties, 1992
in urbanized areas where their prices are unlikely to be caused by commodity programs. Barnard et al. avoided this problem by estimating separate regressions for different regions of the country and by including additional right-hand-side variables to account for effects of urbanization. In Figure 2b, the sample of counties is restricted to the 92 in my sample in which the farm population was 30 percent of more of the total county population. This excludes all counties whose 1992 average farmland values were over $2000 per acre, but the relationship between government payments and land values is still quite loose ($R^2 = 0.24$).

In regressions that include measures of irrigated land, size of farms, percentage of population rural and urban, and the rate of population growth in a county, three measures of commodity program impact are used to estimate effects on county land values. The three measures are government payments per acre of land in farms, payments per acre of cropland, and percentage of the counties land devoted to program-supported crops. The measures have positive effects on land values, as expected, in both regressions on the whole set of 315 counties and on the restricted set of 92 highly rural counties. But the magnitude of the estimated effect varies widely from depending on the exact specification of the regression equation, indicating an additional dollar of payment support per acre increases the value of land by $3 to $15 an acre.

Two underlying problems in this and other cross-sectional attempts to measure commodity program effects pervade these regressions, as they do also the cross-sectional ones of Barnard et al. (1997 and 2001). First, counties with lower commodity program benefits may have lower land values for reasons other than commodity programs or other variables included in the regressions. If commodity programs were to end, land prices in the counties that are now heavily supported would not fall to the levels of the less-supported counties as the regressions would predict. Second, and perhaps more systematically important in biasing the results toward overestimating program effects using cross-sectional data, these regressions hold national-level market conditions constant by construction, since all observations are of a single year. But commodity programs typically encourage more input use and production of supported commodities than would be the case in the absence of the programs. If the programs were removed, market prices of the supported commodities would rise. In the cross-sectional observations, prices received by farmers would rise more in the heavily supported counties than in those that relied less on the programs. Therefore, the cross-sectional regressions that hold commodity prices constant overstate the program effects.

To improve our ability to estimate program effects on land values in the presence of both of these problems, I make use of two cross-sections of county data, for 1950 and 1992. The idea is to explain the growth of farmland value between 1950 and 1992 as a function of support provided during that period. The first problem above is dealt with by including the 1950 value of each county’s farmland as a right-hand side variable. The characteristics of a county’s farmland that affect its value, but are not captured by the other variables in the regression, are held constant by including the 1950 value as an additional variable. The second problem is dealt with through the use of changes
between 1950 and 1992. If programs reduced market prices, the relevant effects of that
decline will show up as a corresponding reduction in the 1950 to 1992 increase in
farmland value.

The case for using 1950 as a base year is as follows. After World War II the
agricultural economy and agricultural policy, as well as the macroeconomic picture, were
unsettled. A general worry about a recurrence of Depression kept asset prices low (stock
market indexes as well as land prices). Commodity programs provided support albeit
relatively little by later standards. Therefore we do not expect to see a large capitalized
expected benefit of farm programs in the 1950 farmland prices, and indeed as Figure 1
shows real farmland prices were then not much above their all-time lows of the 1930s.
During the 1950s, new government programs were introduced to support commodity
markets, including P.L. 480 for subsidized foreign food assistance and the Soil Bank
Program for supply control. After a landmark wheat referendum in 1963, farm policy
moved decisively toward direct payments to producers as a means of support, and that
approach continued in the form of deficiency payments through the 1990 Farm Act.

An indicator of the effects of this four-decade program of support on land values is how
land values changed in counties that varied in their reliance on these support programs.
Table 1 shows what happened to land values in two sub-sets of counties: those with more
than 80 percent of their farmland in program crops (grains, cotton, sugar beets or cane,
tobacco, or peanuts), and those with less than 20 percent of their cropland in those crops.
The former are called program-intensive counties. There are 83 of these counties in the
sample of 315. They are located almost entirely in the South and Midwest. There are 45
non-program-intensive counties, located almost entirely in the Northeast and West. The
non-program counties had initially somewhat higher land values in 1949, and notably for
our purposes the rate of increase in land values in these counties was substantially larger
than in the program-intensive counties. So we have no evidence of commodity programs
boosting land values as compared to counties less reliant on commodity programs.

Figure 3 shows the relationship between a county’s percentage of cropland in program
crops in 1950 and the subsequent increase in farmland value in that county. 8 The
relationship appears weak but negative – the more of a county’s land that was in program

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8 Citations of data for 1949 and 1950 both refer to the 1950 Census of Agriculture. The Census was carried
out in spring 1950 but many questions, for example about yields and acreages, asked for 1949 information.
But in answering the question, what would your farm sell for, presumably the respondent is thinking of
1950. The 1992 Census was carried out in January 1993, but all its questions referred to 1992 data, with
machinery and equipment and other inventories of December 31, 1992 (although the question on land value
asks for “current value.”)
Table 1. County Land Values Per Acre

<table>
<thead>
<tr>
<th>Program Type</th>
<th>1949 Value</th>
<th>1992 Value</th>
<th>1997 Value</th>
<th>Program-Intensive Rate of Increase</th>
</tr>
</thead>
<tbody>
<tr>
<td>83 Program-Intensive</td>
<td>$108</td>
<td>$1035</td>
<td>$1365</td>
<td>5.3%</td>
</tr>
<tr>
<td>43 Non-Program-Intensive</td>
<td>$120</td>
<td>$2975</td>
<td>$3129</td>
<td>7.5%</td>
</tr>
</tbody>
</table>

Source of Data: USDA

* Program-intensive means 80 percent or more of county’s cropland is in program crops
Non-program-intensive means less than 20 percent is in program crops.

** Rate of increase is annual percentage rate of increase since 1949.

Figure 3. Program Crops and Land Value Growth, 315 Counties, 1950-1992
crops in 1950, the less rapidly the value of its farmland grew over the next four decades, despite all the commodity programs of that period.

It may be said that Figure 3 and the Table 1 comparisons tell us little because the non-program counties happened to be located in more urbanized, faster-growing parts of the country where farmland values are largely determined by expected opportunities for conversion to nonagricultural uses, the demand for which grew rapidly over the period considered. Indeed, studies of land value determination have concluded that returns from agricultural production are not the key factors in land prices in many such areas (Hardie, Narayan, and Gardner, 2001), and this again is the rationale, as discussed earlier, for analyzing different regions of the country, and carrying out a multiple regression analysis.

Regression results for expanded models are shown in Table 2. The non-program variables included are the size of farms in 1949 as indicated by sales per farm, the rurality of a county (measured as the fraction of the population living on farms), the rate of growth of the county’s population, property taxes per acre in 1949, the trend rate of total factor productivity growth in the state’s agriculture between 1949 and 1992 (using estimates of Ball, et al., 1997, and Deininger, 1995), and the initial price in 1950 (to hold constant value-determining characteristics not otherwise accounted for). These factors are all significant determinants of the rate of growth of a county’s land value. Nonfarm influences are important. Model 1 says that a 1 percent increase in the rate of growth of the county’s population increases the rate of growth of farmland value per acre by 1.67 percent. The coefficient on rurality in Model 1 indicates that, given the county’s population growth rate, a 1 percentage point increase in the fraction of a county’s population that lives on farms reduces the annual rate of increase of farmland value by 0.009 percent, showing the gains from a county being in an area where the nonfarm population was initially larger. The positive effects of total factor productivity growth and the value of farm sales per acre indicate that the effects of agricultural variables on farmland value are also significant.

The Model 1 results say that, holding the other variables constant, having your county’s acreage heavily in program commodities at the beginning of the support period makes no contribution to increasing value per acre. Indeed, according to these estimates
Table 2. Regression Results Explaining Farmland Value Increase, 315 Counties, 1950-1992.\textsuperscript{a}

<table>
<thead>
<tr>
<th>Independent Variables</th>
<th>Coefficient (Model 1)</th>
<th>Coefficient (Model 2)</th>
<th>Coefficient (Model 3)\textsuperscript{a}</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>5.16 (13.0)</td>
<td>5.01 (12.5)</td>
<td>3.96 (4.7)</td>
</tr>
<tr>
<td>Fraction of cropland in program crops, 1949</td>
<td>-0.62 (-2.8)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Government payments per acre, 1992</td>
<td>-0.00035 (-0.1)</td>
<td>0.0078 (2.2)</td>
<td></td>
</tr>
<tr>
<td>Value of farmland per acre (log), 1950</td>
<td>-1.22 (-12.2)</td>
<td>-1.29 (-13.1)</td>
<td>-0.83 (-4.2)</td>
</tr>
<tr>
<td>Farm sales per acre, 1949</td>
<td>0.0092 (2.8)</td>
<td>0.0091 (2.7)</td>
<td>-0.0005 (-0.1)</td>
</tr>
<tr>
<td>Rurality (percent county population rural-farm, 1959)</td>
<td>-0.91 (-2.2)</td>
<td>-1.13 (-2.8)</td>
<td>-0.15 (-0.2)</td>
</tr>
<tr>
<td>County population growth rate, 1960-90.</td>
<td>1.67 (11.3)</td>
<td>1.78 (12.1)</td>
<td>1.70 (6.8)</td>
</tr>
<tr>
<td>Property taxes per acre, 1949</td>
<td>0.56 (5.3)</td>
<td>0.68 (7.1)</td>
<td>0.17 (0.8)</td>
</tr>
<tr>
<td>Multifactor productivity growth, 1949-93, state-level</td>
<td>2.21 (9.3)</td>
<td>2.24 (9.3)</td>
<td>0.96 (2.5)</td>
</tr>
</tbody>
</table>

\[ R^2 \] 0.611 0.600 0.554

\textsuperscript{a} Estimated for 92 most rural counties only, as defined in text.
farmland increased significantly less in value, the greater the share of acreage in program crops.

Model 2 has the same non-program variables but uses a farm-program indicator more closely related to that of Barnard et al (op. cit.), government payments per acre in 1992. Two problems with this variable as used here are that it uses the single year 1992 as representative of post-1950 assistance to the county’s commodities, and it is likely to be endogenous in a way leading to specification error and bias. The story for the latter problem is that a county whose commodities faced weak market conditions (not captured in the sales per acre variable) will tend to have both lower farmland prices and higher commodity program payments than a county selling into stronger markets. Therefore, the government payments variable will tend to be biased downward; and the insignificant coefficient estimated could well be positive. But the evidence as we have it is at best weak in uncovering commodity program effects on land values in this set of counties.

Model 3 focuses on the 90 most rural counties as defined earlier, on the expectation that commodity policy is likely to make a more significant difference in the farmland market in those locations. Using the same specification as in Model 2, we find a significantly positive effect of government payments and a weaker effect of all the other variables, although the rate of county population growth remains the most significant variable in the equation. The coefficient of 0.017 implies that increasing payments by $1 per acre would increase the rate of growth of farmland value by 0.017 percent. Since the mean value of 1992 payments per acre in these counties is $15, the implication is that the elimination of the programs would cause the rate of increase of farmland values to decline by 0.26 percent; i.e., instead of growing by 1.76 percent annually during 1950-92, without the programs the rate of growth would have been 1.5 percent.

However, the coefficient of government payments is not robust to alternative specifications of the model (not shown) that try other right-hand side variables. The variable measuring initial importance of program commodities in the county, as used in Model 1, gives more robust results and gives no indication of programs boosting the rate of growth of land values in 1949-92.

**Discussion of Findings and Conclusions**

Overall, the evidence from these county data that farm programs have increases farmland values is weak. How can this be, given (a) the strong a priori expectations that these programs are likely to have had major effects, (b) hedonic pricing models such as that of Barnard et al (2001) that find substantial effects of government payments on land values, and (c) the direct observation that acreage carrying rights to receive payments rents and sells for more than similar land that does not? One likely reason is that even though the programs are commodity specific, program crops account for a large fraction of total cropland (50 percent in 1950 and 42 percent in 1992 in the sample of 315 counties), so we are not looking at a specialized type of land use. Over the long run owners of land in almost every area of the country can grow program crops and benefit
from the programs. Therefore the relevant farmland market is a more integrated national market, and land in a given county is less a specific factor of production, than one might expect. Thus farmland in all counties will gain more uniformly from the existence of commodity programs than would be indicated by their initial percentages of acreage in program crops or the level of payments per acre in the county.

Also, in moving from a short-run to a long-run context, commodity supply elasticity may increase more than the elasticity of demand increases (especially because U.S. commodity programs have often constrained supply response in the short run in ways that have not been sustained over the long run). Thus, program benefits from subsidy programs that accrue largely landowners in the short run end up with a larger share going to commodity buyers in the long run.

In sum, even though it is true that eliminating commodity programs today would cause substantial declines in cropland values, the evidence of this paper suggests it may not be true that U.S. farmland prices are significantly higher today than they would have been if commodity programs had never been implanted in the period since 1950; and moreover if farmland values have been increased by those programs, then the increase has been largely across-the-board of farmland and not specific to land growing supported crops.
References


