

# FARMLAND PRICE MOVEMENTS

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Prices of farm real estate have soared during the 1970s. Demand for rural land has appeared to be nearly insatiable in some areas of the country. In many cases, prices of farmland tracts have reached well above levels that returns from foreseeable agricultural production can justify.

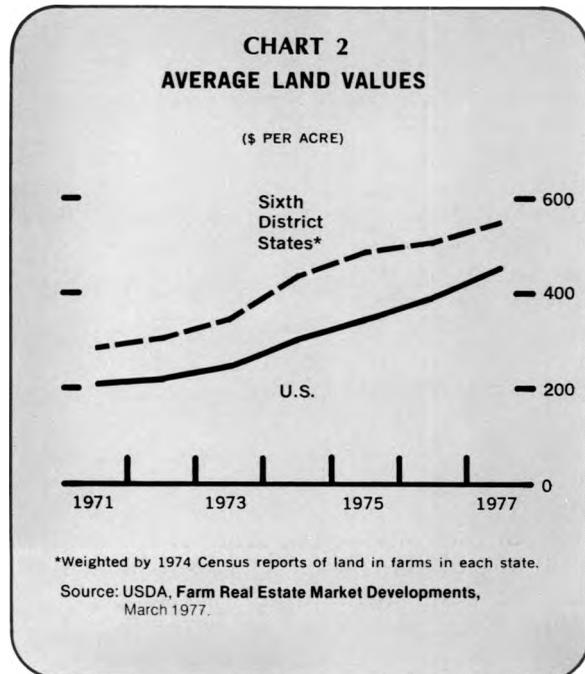
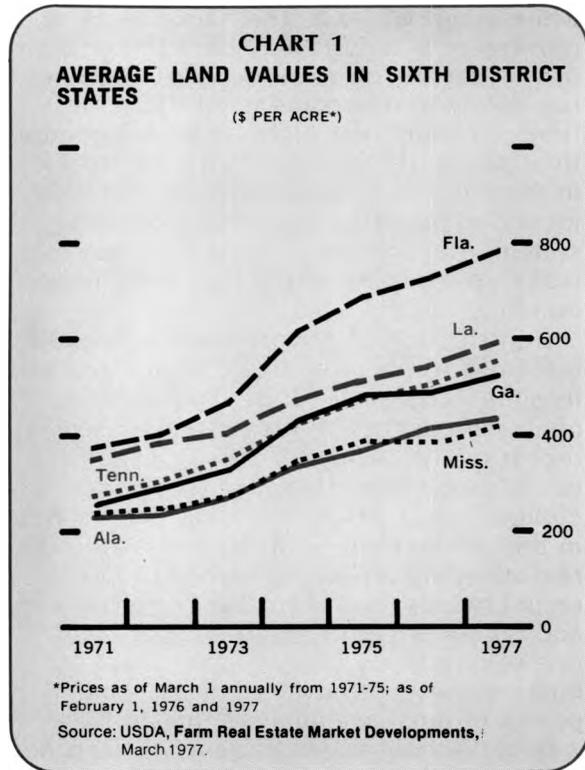
Questions are rife in the current environment. Where are prices rising most rapidly and why? How long can they continue to go up? What happens if they stop increasing or even decline? This analysis cannot answer all these questions decisively. But it focuses on information about factors that will have heavy influence on farmland developments.

### Where Farmland Prices Have Increased.

From 1971 to 1977, average prices per acre of farm real estate nearly doubled for the combined District states (see Table 1). The gains were most rapid in Florida and Georgia, where prices more than doubled. Louisiana and Mississippi farmland showed the lowest rates of increase; however, Louisiana's land prices were the second highest in the District at the outset of the period, and that position was retained in 1977 (see Chart 1).

U. S. farmland prices rose even more rapidly in the 1971-77 period, although the average remained below the average price for the District states (see Chart 2). The faster rate of gain in the U. S. was largely attributable to unusually strong increases in the midwestern states. For example, land prices tripled in Iowa. Although preliminary data for November indicate that the national rate of increase slowed in 1977, substantial gains continued in the Midwest.

**Returns from Agricultural Production Often Fail to Justify Land Values.** The continued uptrend in farmland prices has



been puzzling to many observers in view of the decline in the returns from agricultural production in recent seasons. In the southeastern states, for example, sales of

**TABLE 1**  
**FARM REAL ESTATE PRICES**  
 (\$ per acre)<sup>1</sup>

	<u>Ala.</u>	<u>Fla.</u>	<u>Ga.</u>	<u>La.</u>	<u>Miss.</u>	<u>Tenn.</u>	<u>Average<sup>2</sup> District States</u>	<u>U. S.</u>
1971	227	378	256	350	238	277	284	202
1972	238	404	292	382	242	303	306	218
1973	270	466	333	406	271	349	346	245
1974	337	613	432	474	344	421	436	303
1975	370	692	486	518	386	477	487	343
1976	410	732	488	545	388	507	509	390
1977	437	783	524	590	411	556	548	456

<sup>1</sup>Prices as of March 1 for 1971-75; as of February 1, 1976 and 1977.

<sup>2</sup>Weighted by 1974 Census estimates of land in farms in each state.

Source: USDA, **Farm Real Estate Market Developments**, March 1977

agricultural products at recent prices frequently have not generated sufficient returns above production outlays to repay the interest cost of funds borrowed to purchase land.

For soybeans, the largest single use of cropland in the District, the estimated costs of production, excluding land, were \$121 per acre in 1977.<sup>1</sup> At an average yield of 23.5 bushels per acre, the estimated cost per bushel was \$5.15. During the fall of 1977, soybean prices averaged \$5.38 per bushel—only slightly above the estimated cost per bushel. Growers who borrowed money at 8.5 percent interest to purchase land at the average 1977 price of \$550 per acre had little money from soybean returns to apply to the \$47 annual interest charge per acre. Lenders would normally expect some repayment of principal as well as interest. The lack of returns for loan repayments suggests that farmland prices have reached levels that cannot be justified by returns from agricultural production.

Whether or not he had a debt outstanding, an owner should have earned at least \$47 from an acre of cropland to compensate for the forgone opportunity to invest \$550 in an alternative that would have paid 8.5 percent interest. The average return from land employed in soybean production in 1977 did not equal the

opportunity cost of invested funds. And unless the support price is raised substantially from its \$3.50 level in 1977, the intended expansion in plantings indicated for 1978 is expected to exert continuing downward pressure on prices. While returns from other crops may be higher, the land on which crops, such as cotton, corn, and peanuts, are produced usually commands prices well above the average.<sup>2</sup>

**Appreciation in Land Values.** The initial major thrust for the rise in land prices was the high farm profits associated with worldwide shortages of food in the early Seventies. More recently, the source of the upward push has apparently been expectations of further increases in the value of the asset itself. Investors are willing to purchase a future stream of income at a discounted present value. That is to say, if one anticipates a given annual return from an asset over a span of years, that income stream has a determinable value in the present. It is not the sum of the expected dollar income in all future periods, because a dollar to be received one year from now is worth less than a dollar of current income. A dollar received currently could be placed in an interest-earning investment which would yield \$1.06 at the

<sup>2</sup>It is difficult to make general statements about land values on the basis of averages. Most agricultural statistics vary widely around their average values. That is particularly true of production costs and yields or output per acre. Those farmers who obtain above-average yields and have below-average costs can, of course, justify much higher prices for land than can their less efficient counterparts. Thus, land prices that are unreasonably high for average or inefficient producers may be quite justifiable for above-average producers. It is the latter who are reportedly bidding most briskly for productive land.

<sup>1</sup>See W. F. Woolf and B. J. Vidrine, D. A. E. Research Report 526, Louisiana Agricultural Experiment Station, January 1978. Costs varied both above and below the indicated figure, depending upon the type of farm and the method of production.

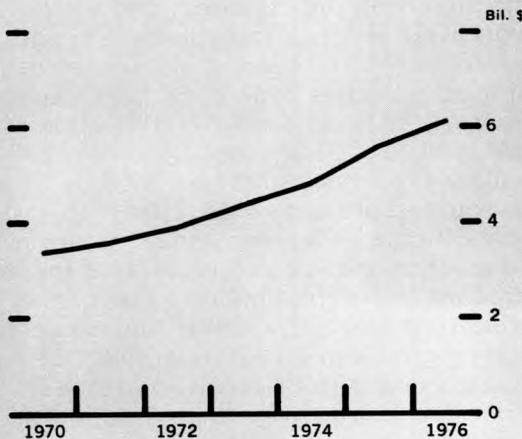
**TABLE 2**  
**GROWTH IN PRICES OF FARM REAL ESTATE**  
**1971-77**

	Trend Rate <sup>1</sup> of Growth (\$ per acre)	Compound Annual <sup>2</sup> Growth Rate (%)
Alabama	38	12.8
Florida	75	14.4
Georgia	48	13.5
Louisiana	41	9.4
Mississippi	33	11.1
Tennessee	49	13.0
District States	48	12.6
United States	43	15.1

<sup>1</sup>Derived from a straight line equation of type  $\hat{y} = a + bx$  where  $\hat{y}$  is the estimated land value,  $x$  is the year number where 1971 = 0, 1972 = 1, etc.;  $a$  is the estimate of  $\hat{y}$  when  $x = 0$ , and  $b$  is the estimated change in  $\hat{y}$  for each 1-unit change in  $x$ . See Appendix for each equation.

<sup>2</sup>Derived from an exponential equation of the type  $\hat{y} = ab^x$  where  $\hat{y}$  and  $x$  are as defined above,  $a$  is the value of  $\hat{y}$  when  $x$  is 0, and  $b$  is the percentage change in  $\hat{y}$  for each 1-unit change in  $x$ . See Appendix for each equation.

**CHART 3**  
**TOTAL FARM MORTGAGE DEBT**  
**SIXTH DISTRICT STATES\***



\*Debt outstanding as of January 1 of each year.

As the rate of appreciation in land values became apparent during the past seven years, the ranks of land purchasers were undoubtedly enlarged by investors whose bid prices were keyed to anticipated gains in asset value rather than the actual return from agricultural production. The record shows that such investors have certainly not been disappointed since 1971. It has been increasingly reported of late that foreign investors are frequently numbered among potential purchasers of land.

What price for land is justifiable on the basis of expected appreciation in value alone? The technique of determining the present value of a future stream of income provides an answer.

Land prices in District states have been increasing at an average rate of \$48 per year since 1971 (see Table 2). The present value of a perpetual \$48 annual income stream, discounted at 8.5 percent interest, is \$565,<sup>3</sup> only slightly above the average price recorded for 1977. When average annual taxes on farm real estate are considered, the present value of farmland is approximately equal to the 1977 price. The average price of \$284 per acre in 1971 provided an outstanding bargain to purchasers whose land value appreciated to \$548 per acre by February 1, 1977. An asset offering a return of that magnitude after six years would have had a discounted present value of \$336 in 1971.<sup>4</sup> It was not until 1973 that average land prices

<sup>3</sup>When annual income is constant and continues in perpetuity, the present value of future income is derived by using the equation:

$$V = \frac{I}{i}$$

where  $V$  is present value,  $I$  is constant annual (net) income, and  $i$  is the discount (capitalization) rate. For the appreciation in land values in the District states (ignoring taxes and other ownership costs of land), the present value per acre is

$$V = \frac{\$48}{.085} = \$565.$$

<sup>4</sup>The present value of a given income in a future year is given by

$$V = \frac{I}{(1 + i)^n}$$

where  $V$  and  $i$  are as described in footnote 3,  $I$  is future income, and  $n$  is the number of years before the income will be received. Assuming land was sold at the average price per acre in District states in 1977, its present value in 1971 would have been

$$V = \frac{\$548}{(1 + .085)^6} = \$336 \text{ per acre.}$$

end of a year. Alternatively, one could obtain \$1 after one year by putting less than \$1 (about 94 cents) in an account earning 6 percent annual interest.

**TABLE 3**  
**EFFECTS OF LAND PRICE CHANGES ON FARM REAL ESTATE ASSETS**  
**SIXTH DISTRICT STATES, 1971-77**

	<u>Land in Farms*</u> mil. acres	<u>Value of Farm Real Estate</u>	
		<u>1971</u>	<u>1977</u>
		billion \$	
Alabama	12.0	2.7	5.2
Florida	13.2	5.0	10.4
Georgia	14.0	3.6	7.3
Louisiana	9.1	3.2	5.4
Mississippi	14.4	3.4	5.9
Tennessee	13.3	3.7	7.4
<b>Total Sixth District States</b>	<b>76.0</b>	<b>21.6</b>	<b>41.6</b>

\*Taken from 1974 *Census of Agriculture* and used with average prices to calculate values in 1971 and 1977.

actually reached that level. By 1977, however, investors had bid land prices much closer to the level that was justified by the experienced rate of annual appreciation. Only in Florida and Georgia were prices still substantially below that level.

**Effects of Rising Land Prices.** One of the most immediate and direct effects of rising land prices is their influence on the asset positions of the balance sheets of farm owners. As land prices rise, the estimated value of total assets increases, almost in direct proportion. The value of real estate accounted for 74 percent of total U. S. farm assets in 1977. Rising land prices pushed up the estimated value of farm real estate in the Sixth District states from \$21.6 billion in 1971 to over \$41 billion in 1977 (see Table 3). Florida was the leading state in both value and gain, although it ranked fourth in farmland area.

The increase in asset values raised proprietors' equities along with it and enabled farmers to expand borrowings, using the higher valued real estate as collateral. Total farm mortgage debt (shown in Chart 3) advanced about in pace with farm real estate values during the period. The rise in outstanding farm mortgages from \$3.4 billion in 1970 to \$6.1 billion in 1976 represented a sharp increase in farm loan volume by lenders in Sixth District states as well as greater interest expenses for land owners (who paid rates on new loans averaging between 8¼ and 10 percent during the period). If it continues

to grow at its 1970-76 trend rate, farm mortgage debt will climb nearly \$500 million annually, as owners utilize their rising equity in land to obtain the capital needed for production.

**Will Appreciation Continue?** Will farmland prices continue to escalate? How much higher can they go in the absence of returns of agricultural production to support these values? If values stop increasing from year to year, will prices then plunge to the levels that production returns can support? These are difficult questions that are currently being asked by a broad spectrum of people associated with farm real estate markets.

Factors that could produce continued rapid increases in value include:

1. an increase in inflationary expectations that would cause investors to turn to land as a hedge against loss of value in financial assets. Competition among potential land purchasers for available tracts would essentially guarantee a continued upward push on values.
2. a growing demand for farmland located near urban areas for future expansions of residential areas, office parks, and industrial parks. This has already been an important influence on land prices, particularly in the states of Florida, Georgia, and Louisiana.
3. the possibility of higher production returns. Should prices of farm products again rise as rapidly as they did in 1973 (e.g., if world shortages of food crops

should recur), the increased returns from agricultural production would swell the expected future income stream and produce even greater appreciation.

On the other hand, a halt in the escalation of land values, or even a substantial reduction in the expected rate of appreciation, could trigger deflation. In such a case, investors would reduce bids to the values that production returns would justify.

Before the passage of the Agricultural Act of 1977, prices of many agricultural products had dropped sharply and appeared to be headed for still lower levels. That situation, compounded by drought-reduced crop yields in the Southeast, may

have slowed the rate of growth in District land prices from 1977 to 1978. In 1975 and 1976, a severe reduction in cattle and calf prices was no doubt responsible for the slower rate of growth evident in farmland prices within the District. Despite the long period of adversity in cattle production, however, prices of land only leveled; they did not decline. Thus, it is not certain that a downturn will accompany the recent poor returns to crop production. However, if the agricultural legislation that supports prices and incomes of producers of major crops were to expire or become less supportive in the future, the threat of farmland price deflation would be substantially greater. ■

## APPENDIX

Equations were fitted to annual average land prices from 1971 to 1977. Variables are defined in footnotes to Table 2. The coefficients of determination ( $r^2$ ) signify the proportion of variation in Y explained by changes in X.

Trend Equation		Exponential Equation
$\hat{Y} = 211.929 + 38.357X \quad (r^2 = .978)$	<b>Alabama</b>	$\hat{Y} = (221.390) (1.128)^X \quad (r^2 = .973)$
$\hat{Y} = 356.464 + 74.892X \quad (r^2 = .965)$	<b>Florida</b>	$\hat{Y} = (347.050) (1.144)^X \quad (r^2 = .954)$
$\hat{Y} = 257.036 + 48.179X \quad (r^2 = .950)$	<b>Georgia</b>	$\hat{Y} = (265.485) (1.135)^X \quad (r^2 = .936)$
$\hat{Y} = 342.357 + 41.357X \quad (r^2 = .988)$	<b>Louisiana</b>	$\hat{Y} = (350.279) (1.094)^X \quad (r^2 = .985)$
$\hat{Y} = 226.500 + 33.071X \quad (r^2 = .933)$	<b>Mississippi</b>	$\hat{Y} = (232.319) (1.111)^X \quad (r^2 = .924)$
$\hat{Y} = 265.750 + 49.036X \quad (r^2 = .988)$	<b>Tennessee</b>	$\hat{Y} = (277.394) (1.130)^X \quad (r^2 = .981)$
$\hat{Y} = 273.236 + 47.764X \quad (r^2 = .971)$	<b>District States</b>	$\hat{Y} = (283.394) (1.126)^X \quad (r^2 = .961)$
$\hat{Y} = 179.143 + 43.000X \quad (r^2 = .973)$	<b>United States</b>	$\hat{Y} = (194.063) (1.151)^X \quad (r^2 = .991)$