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Valuation*

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THE ECONOMICS OF ASSET VALUES AND CURRENT INCOME
IN FARMING

"The desire to own land is one of the strongest implanted in the human heart."

C.V. Gregory, Editor, Prairie Farmer 1919

by

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and

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In March of this year land values in the United States averaged 3 times their 1970 level. The increases in this decade surpassed even those following World Wars I and II. It is not surprising that this Association should once again inquire into both the causes of land value changes and the implications of these changes for the future of Agriculture.

Increasing land values are viewed by some with elation and by others with concern. To some the old saying that "farmers live poor and die rich" has been verified. Land owners have generally benefited from the sharp growth in their wealth position. But they dislike the higher real estate taxes that follow land appreciation. And they foresee difficulty in expanding their farms or in transferring ownership to younger farmers.

Some who borrowed to buy land have experienced major cash-flow problems. An example might help illustrate how such problems arise. Assume that a tract of land which can be bought for \$2,000 per acre will yield a return of \$100

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above variable production costs. If the buyer pays \$400 down, his debt carrying charges on a 25 year mortgage at 10 percent interest would be about \$176 or \$76 more than his first year earnings. However, if his income were to increase by 5 percent per year he would be earning enough income by the 13th year to service the debt and have money available for other purposes. By the year of the final mortgage payment, his income would be double his principal and interest payment. Thus, the initial cash flow problem would have turned into a highly desirable cash surplus. In addition, the borrower would have benefited from substantial capital appreciation. The question is, how does he service his loan during the first 12 years.

Secretary Bergland recently stated, "I see the benefits of many of our farm programs going not to improve the incomes of rural families needing help but contributing, instead, to higher and higher land prices.

Higher land prices, in turn, build in high fixed production costs which make it very difficult for young and new farmers to get started or for the tenant farmer to become an owner operator." (p. 6)

Besides the implication that rapidly rising land values will dramatically alter the structure of the farm sector and do violence to the national ideal of the family farm, many people now feel that land is overvalued in relation to earnings. Values are said to have reached unrealistic levels.

This concern is not new. Exactly 50 years ago, L.C. Gray, at a meeting of the American Farm Economic Association noted, "There seems to be much confusion prevalent as to the future element in land values.

Some economists would call \$140 land 'overvalued.' What they mean is either that it is valued at more than present net incomes warrant, or at more than future incomes will probably justify. Whichever they mean, they are misusing the term value. Land being a fixed good, cannot escape having its value based on an uncertain future. That future will create a net income for it which is bound to be something different, either more or less than present income... The value which is based on an assumption of rising incomes is therefore just as real a value as one based on the assumption of present incomes perpetuated."

Since Gray made his comments in 1919, many researchers, including among others, John D. Black, Ernst Wiecking, William Scofield, Willard Cochrane, and Luther Tweeten have attempted to explain land price behavior. A review of their works shows many possible explanations for land price changes.

As early as 1927, Wiecking recognized that net farm income was a poor proxy for returns to land and that real estate values could not always be expected to move in unison with farm income. However, in 1964, Scofield observed that land prices, which from 1912 to 1940 had moved in an almost parallel fashion with farm income, were diverging from the income trend. He concluded that it was paradoxical for land values to rise without an accompanying rise in income.

In the remainder of this paper, we will attempt to clarify the economics of land valuation and explain what we believe are the under-

lying forces in the land market. We will also briefly address what is implied for agricultural structure and policy.

We should say at this point that we accept the theory of value which can be stated as:

$$V = \sum \frac{a_t}{(1+i_t)^t}$$

where V = the current value of an asset

a = expected value of the annual return
in year t

i = the expected value of the discount rate
in year t

In any year, expected returns are some function of farm commodity and input prices, yields, taxes, interest rates, credit terms, inflation rates, the potential for disposing of the tract for some higher and better use, and a long list of other variables. Discount rates are a function of the time preference for money, risk, and inflation.

Thus, to explain the present value of land we must explain factors which influence expectations of net returns to land and those which explain the formation of expected discount rates. Developing the formula becomes a very complex and somewhat overpowering problem, if all these factors are taken into account. It is tempting to simplify the formula as many appraisers and researchers have done to $V = \frac{a}{i}$ where (a) represents current earnings and (a) and (i) are assumed constant into perpetuity.

Such a formulation frequently has lead researchers, lenders and appraisers to believe that land is overvalued because current returns do not explain current land values. Alternatively, they believe that land earnings are below those in other potential investments. In reality land earnings have not remained constant over time and thus $V = \frac{a}{i}$ has misrepresented actual experience.

Real estate accounts for nearly three-fourths of all farm assets and returns to assets are based on farm income. Thus the relationship between returns to assets and asset values can help in understanding farm real estate values (figure 1). Returns to assets are calculated as a residual by subtracting estimated returns to labor and management from returns to labor, management and total assets, including borrowed capital and farm assets of landlords. From 1940 through the early 1950's asset returns increased more rapidly than asset values. During the late 1950's and early 1960's values rose slightly more rapidly than asset returns. From 1963 to date the general tendency has been for returns to increase faster than values, even though the increase in returns was interrupted after the 1973 high. Overall since 1940, returns to assets have increased in both absolute and relative terms.

Although data on returns to assets are not available for 1910-40, assets including land are believed to have received a relatively constant share of net income. In that period, land values generally rose and fell with current net income from farming. The share of net returns going to assets rose from less than 30 percent in the 1940's to more than 60 percent in the 1970's (figure 2).

The relationship between cash rents and values also provides evidence that agricultural rents and land values have follow parallel trends in major farm states of the Plains and Corn Belt (figure 3). The ratio of cash rent to value has, therefore been nearly constant.

FIGURE 1. -- INDEXES OF RETURN TO ASSETS AND
ASSET VALUE 1968=100

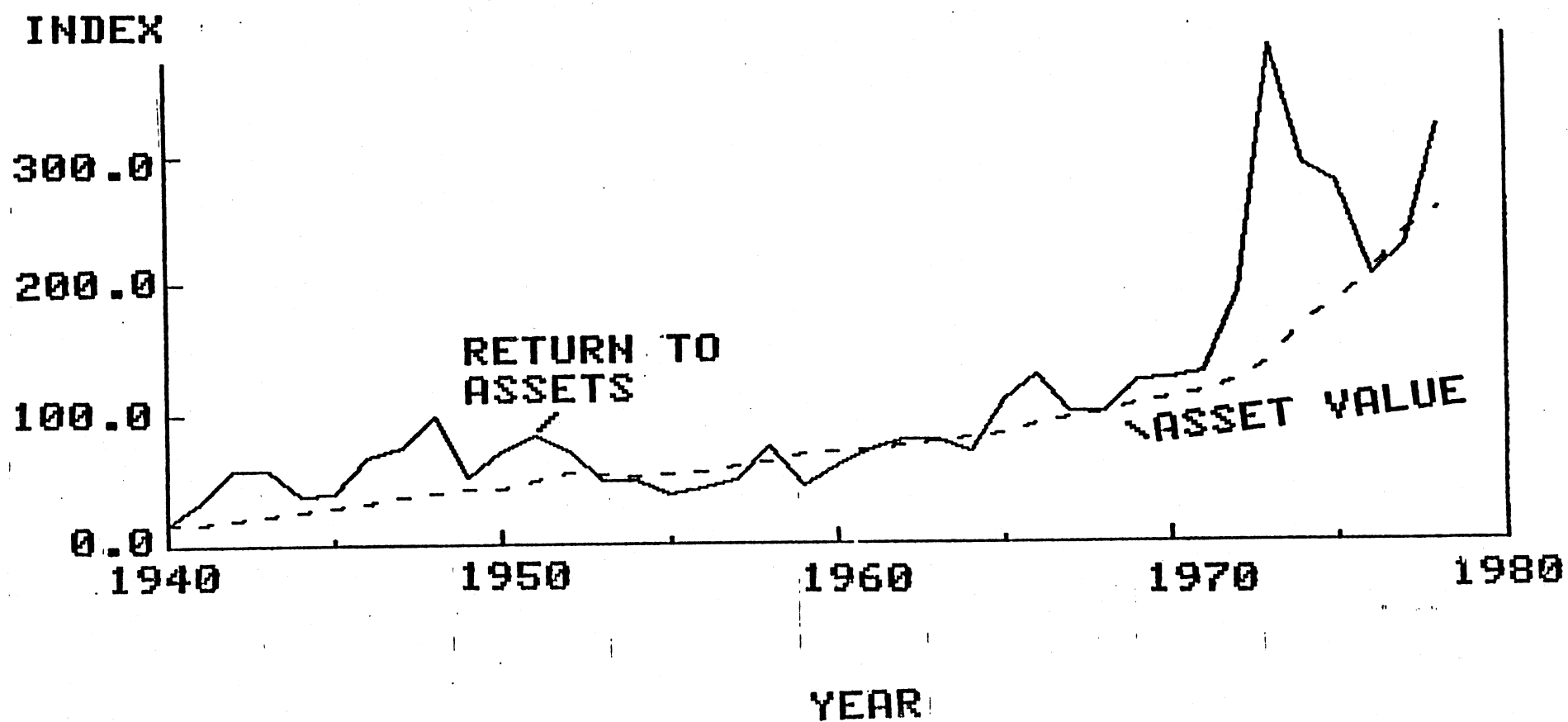


FIGURE 2. -- ASSETS SHARE OF RETURNS 1940-1978

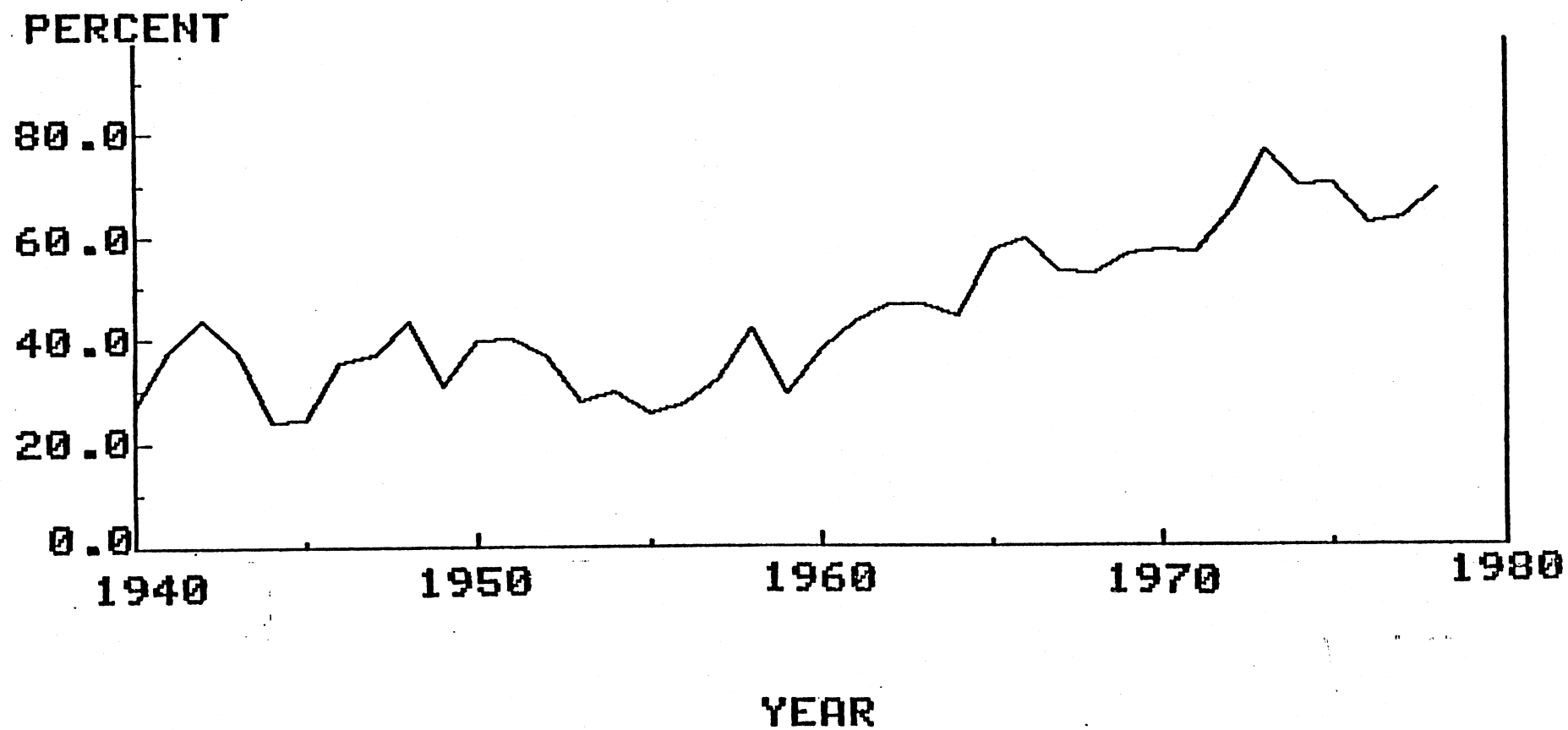
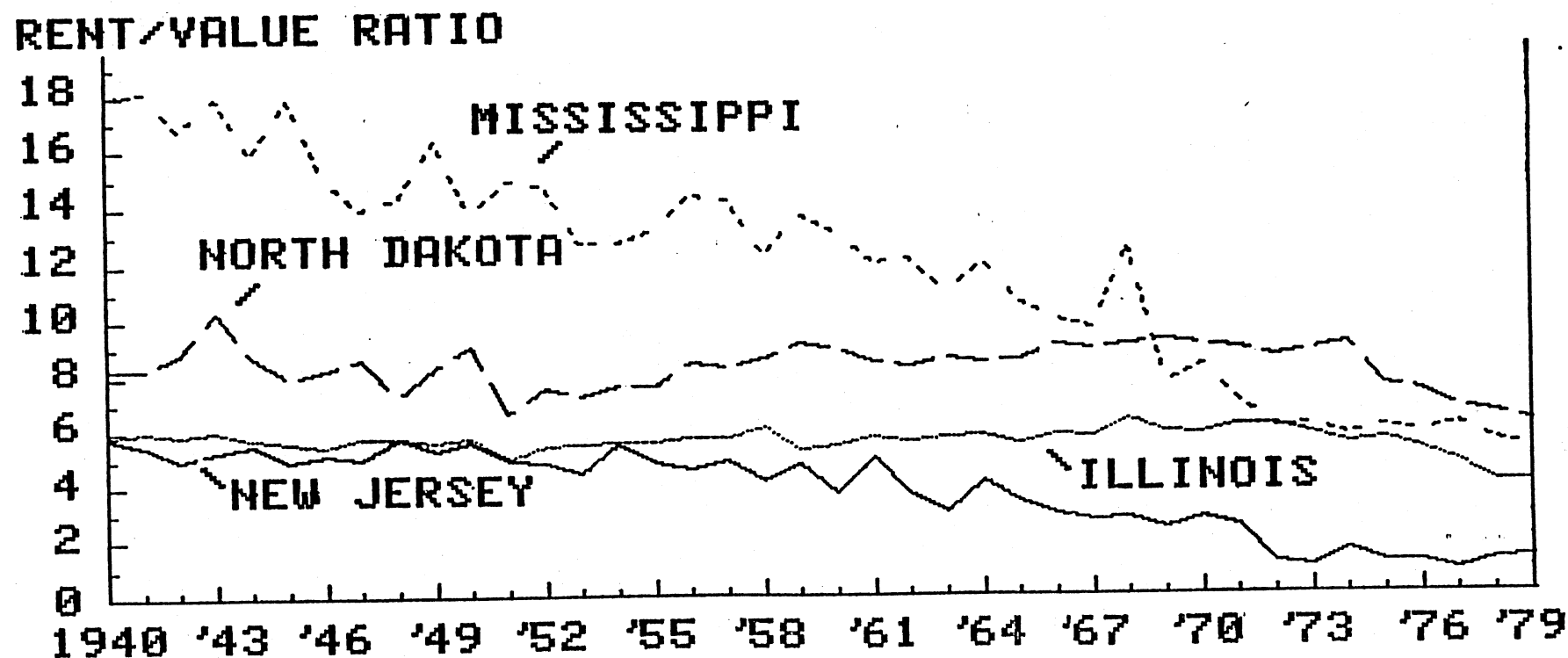


FIGURE 3. -- CASH RENT TO VALUE RATIOS, 1940-79
SELECTED STATES



In North Dakota and Illinois, for example, the ratio of gross cash rent-to-value remained nearly stable from 1940 to 1970.

Trend lines computed for the period show no significant slope.

However, since 1970 rent value ratios have declined rather sharply, at a rate of $-.24$ ratio points per year, suggesting that earnings expectations have changed. Apparently, land buyers believed that future returns will exceed current earnings by a substantial margin.

In New Jersey, where agricultural earnings are a minor component of the total expected return from land, agricultural rents have declined in relation to value since 1940. This decline may be explained by the rapid urbanization of New Jersey and by the expectation that future earnings are more likely to come from urban uses than from agricultural production.

Land rents have also declined rapidly in relation to value in Mississippi since 1940. However, the reason for the decline is different from the New Jersey example. In Mississippi, rents in the early years were distorted by imperfections in the land purchase and rental markets. Land was held in very strong hands and many tenants who had few alternatives were competing for the right to rent land. Over time the numbers of tenants declined sharply as nonfarm opportunities increased and production technology changed. Land became more readily available on both the purchase and rental markets. Apparently, a major structural change occurred which brought rent-to-value ratios closer to those of Midwest agriculture.

These data suggest, rather strongly, that an individual buying land at any time during the last 40 years would have been in error if he had assumed that earnings would remain constant in the future. Under the conditions, which prevailed during this period, it is clear that the ratio of current rents to current values would have represented a substantial understatement of the actual rate of return.

We now ask if it is reasonable to expect land earnings to continue to rise in the future? What factors are likely to determine expectations? If earnings and values are to increase, how will it be possible for new buyers to withstand the substantial cash flow problems that arise in the early years of land ownership with debt financing? We might also question how it is possible for returns to assets to continue rising in an excess capacity industry.

Assuming that you accept the theory that current land values are determined by expected earnings, we will proceed to explain those factors which have been important in determining expected earnings and, therefore, underlie the demand for land.

Even in a static economy, we would expect land earnings to differ among tracts, areas and regions, because of soil, climate, population density, mineral resources and transportation infrastructure. Clearly, such factors impact on earnings expectations and therefore on values. Because much has been written about them, we will say no more about these cross-sectional forces.

The important issue is, what causes expectations of earnings and values to vary over time. Perhaps the most important factor, which acts as a demand shifter for land, is population growth. Other things equal, an increase in population will increase the quantity of land demanded at any price. Because the aggregate quantity of land is fixed, earnings will increase as a result of the increased demand for food, fiber, and space. Prices must rise to reallocate land among those who currently own it and those who desire to hold it. Marketing of U.S. agricultural products overseas has an affect similar to a domestic population increase.

Inflation also takes its toll. When prices rise rapidly during a general inflation, production of most goods can be increased to at least partly satisfy the demand. But new land cannot be developed despite strong demand. Thus, land values can be expected to increase more rapidly than the general inflation rate. Buyers also see land as an inflation hedge.

During an inflationary period the tendency is for nominal asset prices to increase as the money supply increases relative to the quantity of the asset. Even if the money supply increases in line with growth in GNP, the ratio of money to land is increased and some inflation in land values can be expected. The United States has had a policy of monetary expansion. This policy, we suggest, has been a factor in the increasing land prices.

If the terms of trade in land are modified by changing access to debt financing and interest rates, these changes will shift the demand for real estate to the extent that they modify the ability of buyers

with a given set of earnings expectations to bid for land. An extension of the repayment period, a reduction in the downpayment or lower interest rates will each result in an increase in the number of potential buyers at any price. Government guarantees for marginal borrowers, so that lenders are not subject to loss of principal should the borrower fail, have the same effect.

It has often been argued that more lenient credit terms were required to ease the entry of young people into farming. However, such changes in terms benefit only the earliest buyers. Cash flow and equity advantages are soon bid into the price of land. Therefore, with each relaxation in credit terms, land prices can be expected to rise more rapidly, then resume a normal pattern of change with future benefits discounted.

Tax policy also alters the earnings of land through taxation of receipts from production, taxation of appreciation (capital gains) and taxation of real estate values. The Government policy of minimizing taxes on capital gains has encouraged investment in real assets, particularly land. Not only have we taxed capital gains at rates well below those on earned income, but we now forgive taxes on the first \$100,000 of such gains on residences for those over age 55.

Also, we have increased the size of the inheritance and estate tax exemption and developed procedures to tax estates at "agricultural value" rather than at market value. Such tax laws encourage investment in land and reduce the amount offered for sale.

Preferential or use value assessment of real estate has also changed land values. Depending on how these laws are written they can either increase farm earnings or result in land being held for speculation in non-farm alternatives, or both.

Among Government actions taken to assist farmers are programs designed to increase or at least stabilize farm income. Such programs have directly raised land earnings by increasing the value of the product of land and have indirectly increased earnings by reducing the risk involved in crop production. These programs have operated through direct subsidy to idle land resources and through control of market prices. The net effect of such programs is that earnings and land values which are a function of earnings are higher than they would have been in their absence.

The implications of continuously rising land values for the structure of the agricultural sector are that current land owners will benefit from wealth changes at the expense of future generations of farmers. If nominal earnings and values rise faster than the general price level, it will become increasingly difficult for prospective farmers to acquire viable farm units. Land ownership and wealth will tend to become concentrated into fewer hands as current land owners add marginal units to existing operations. Entry into farming will occur mainly through inheritance. Few tenants will obtain sufficient capital to become owners. Control of land resources will go to those with the greatest wealth and highest earnings expectations. This process is likely to be aided by policies arising from our concern for the beginning farmer. We can expect continued increases in land values. Our

production sector is likely to differ greatly from the Jeffersonian ideal.

Concluding Remarks

If the land market is not allocating land resources and wealth in a manner consistent with economic or social objectives we must consider impacts of present actions and recognize potential consequences of alternative policies.

It would be possible to tax capital appreciation at the same or a higher rate than earned income, reduce the incentive to hold land as a store of value, and slow the accumulation of wealth. Use valuation for real property and estate taxes could be restricted. We could limit borrowing against real estate. This would decrease leverage that current land owners obtain from appreciation in real estate values. We could modify the tax law so that interest payments on real estate were no longer deductible. Commodity income programs could be eliminated or greatly modified to increase market risk and reducing land earnings. All land sales could be controlled by a government agency with redistribution to "worthy" farmers. Acreage limitations could be applied to land holdings. It would be possible to restrict corporate control of farm land to leasing arrangements of 30 years or less, thus placing them on planning horizons similar to individuals.

Such actions would tend to limit concentration of ownership, reduce competition in the land market, increase the risk of farming, and probably limit gains in production efficiency. But which of these policies would be economically, socially, and politically acceptable as means to limit further land price increases and further concentration of wealth? Although we may not like it, if we are serious in our concern over rising land values, we will need to consider such actions.

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