AGRICULTURE

FARM REAL ESTATE SALES

in Illinois

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CONTENTS

This study was initiated by the Farm Economics Division, Economic Research Service, U.S. Department of Agriculture, as a part of its continuing research program in farmland values and valuation. Later the Department of Agricultural Economics, University of Illinois, assumed major responsibility for completion of the study.

The basic data for the study were provided by the Property Tax Division, Department of Revenue, State of Illinois. This office obtains transcriptions of all bona fide transfers of real property from county deed records as a part of its periodic review of assessment levels and procedures. The authors wish to express special thanks to Richard J. Lyons, Director of the Department of Revenue, and E. L. Maynard, Supervisor of the Property Tax Division, for making the data available. Their guidance and counsel in technical matters regarding the use and interpretation of these data is gratefully acknowledged.

Farm Real Estate Sales in Illinois

Folke Dovring and William H. Scofield[1]

Illinois has long been noted for its productive and high-valued farmlands. With a current (1963) market value of $9.9 billion, the level and trend in prices of farm real estate are of concern to many thousands of landowners, lenders, and tax officials. Sales of land provide the most concrete and objective evidence of the prevailing prices being paid and of the process by which participants in the market express their judgments with respect to the many factors that determine the price of land.

Land transactions also provide opportunities to adjust the size of operating units to the family life cycle and to technological developments. The ready market for land in the last two decades has made it possible for owners to realize substantial capital gains on farmland that had been acquired at lower prices.

The availability of sales records for practically all bona fide farmland sales in the state for a five-year period provided a unique opportunity to document and analyze the level, trend, and size characteristics of land sales in the various areas of the state.

These records contained close to 16,000 sales of farm property for the period April 1, 1952 through March 31, 1957. The sales of farm property covered 1,261,000 acres of farmland, with an aggregate sales price of about $265 million.

Several comparisons also were possible with other independent estimates of market values. Comparisons of the size characteristics of lands sold with farm operating units help document the extent of the parcel market and the key role it plays in the steady trend toward fewer but larger farms in the state. Some new information is also present on the relations between gross and net returns from farmland and sales prices.

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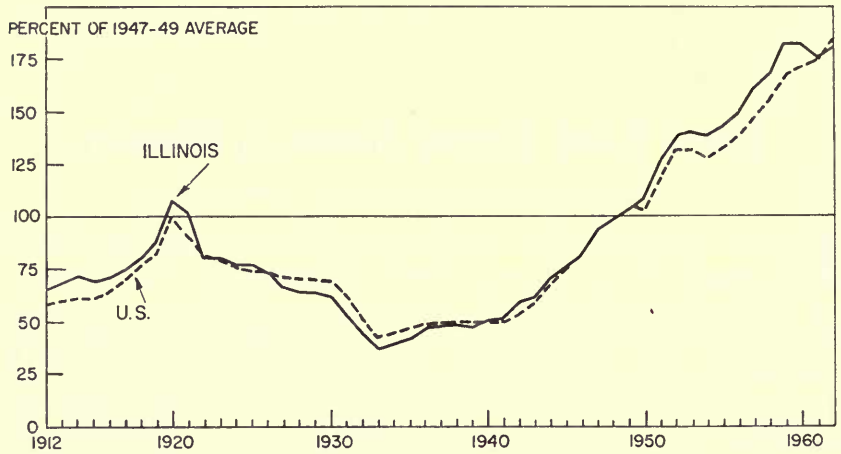


Index numbers of average value of farm real estate (farmland and buildings) per acre, Illinois and United States, March 1, 1912-1962, 1947-49 = 100. (Fig. 1)

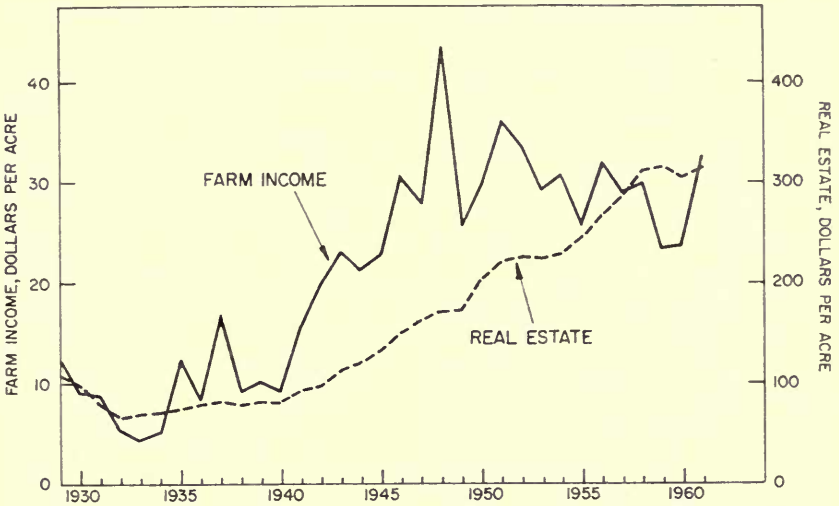
Background Data for the State

Long-term trend in market value of farm real estate and relationship to farm income

The long-term trend in farm real estate values in Illinois has been remarkably similar to that in the United States as a whole (Fig. 1). In 1920, the national index did not rise quite as high as the Illinois index, and in the early 1930s, it did not drop quite as low. The Illinois curve thus tends to go a little farther than the U.S. curve in the more extreme changes, for in a more homogeneous area like Illinois, there are fewer contrasting trends canceling out each other.

Some difference may be noted in the trend in farm real estate values during the last decade. In the 1940s, the general rise in values was quite similar, but between 1950 and 1960, the Illinois index advanced more than the U.S. index. In 1961, the difference again disappeared. Although the difference between 1950 and 1960 was moderate, it is of some interest.

The 1940s were a period of inflation, and as a consequence, the rise in land values during that period was more apparent than real. In real (deflated) terms, land values advanced only moderately. The close agreement of the Illinois index with the national data in the 'forties is noteworthy. In the 1950s, by contrast, the value of the dollar changed slowly, and the rise in land values was real for the most part. The somewhat faster rise in Illinois than in the United States as a



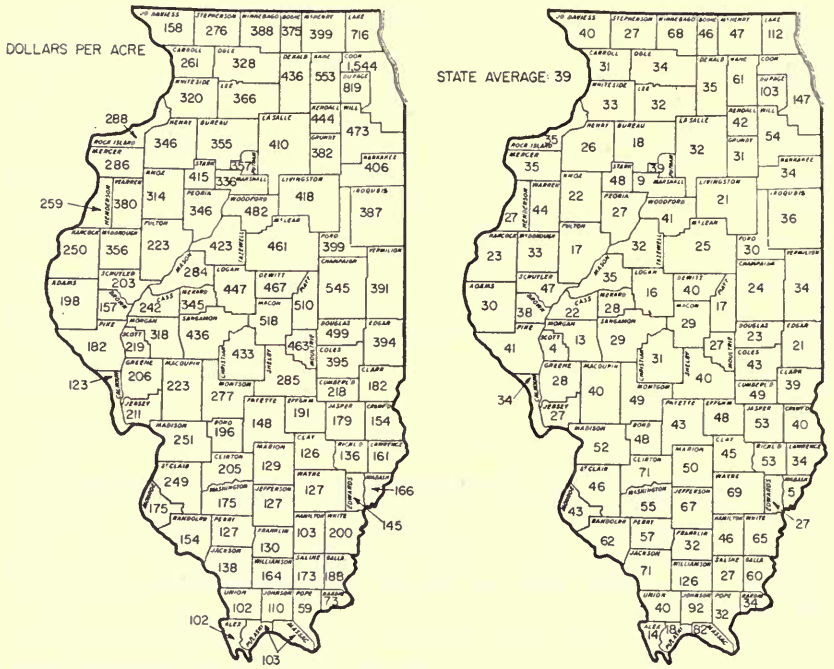
Net farm income and farm real estate values, Illinois, 1929-1961. Net farm income includes rents paid to nonfarm landlords and interest on farm mortgage debt. Real estate includes farmland and buildings, March 1 of following year. (Fig. 2)

whole during the 'fifties becomes more significant against this background. The land price development in Illinois thus offers a good opportunity to analyze land price changes in the United States.

The changes in farm real estate values are more meaningful when compared with changes in farm income (Fig. 2). During the 1940s, farm incomes rose more than real estate values, and in some of these years, returns from farm real estate in the United States were higher than those from common stocks.[1] By contrast, the rising trend of land values during the 1950s, in real terms, was accompanied by a decrease in the proportion of net farm income to real estate values. During the last few years, farm real estate has not even returned an interest equal to the current interest rate on mortgages. In both changes in farm real estate values and in farm income, the development in Illinois has generally been the same as in the United States as a whole.

The average level of value per acre of farmland and buildings, according to the 1959 Census of Agriculture, is shown for each county in Illinois in Figure 3 (left). The percentage change between the 1959 and 1954 census data is shown in Figure 3 (right).

[1] W. H. Scofield, "Returns to Productive Capital in Agriculture," *The Farm Real Estate Market*, February 1960 (July-November 1959).

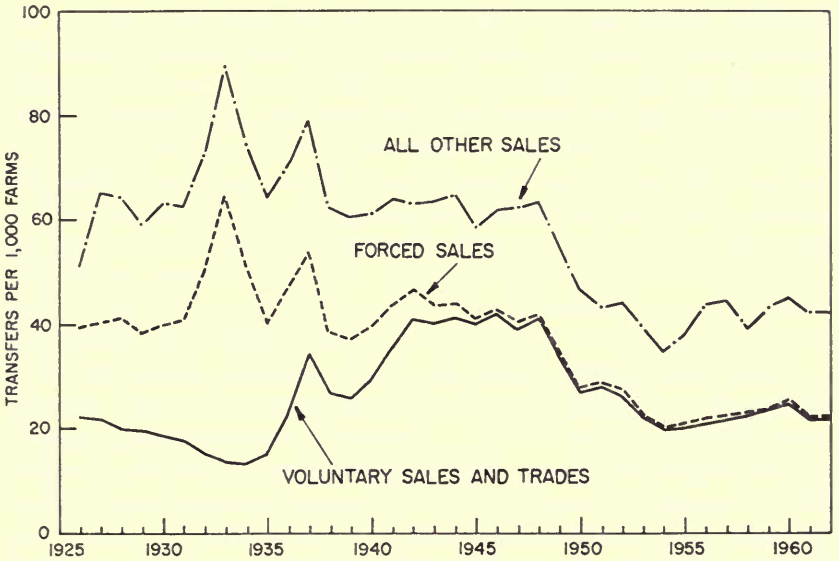


Average value per acre, 1959 Census of Agriculture (left), and increase in average value per acre in the 1959 census as percent over the value in the 1954 census (right). **(Fig. 3)**

Rate of transfers by type

An important background factor in changes in farm real estate values is the rate of transfers. Some main features of the rate of transfers are given in Figure 4, distinguishing between voluntary sales, forced sales (including both foreclosures and tax sales), and other sales. The latter group includes administrator and executor sales as well as sales resulting from inheritances and gifts and other miscellaneous and unclassified sales.

There was a high total rate of transfer in the 1930s, especially in the beginning of the decade when the price of farmland was still going down. This high rate of transfer reflected the depressed condition of agriculture at that time. Forced sales were the largest category, while voluntary sales were less than one-third — in some years less than one-fifth — of all transfers. Apart from the direct effects of the depression upon incomes and hence upon land values, this high rate of forced sales is likely to have contributed to depressing land prices by creating a large supply of farmland on the market.



Estimated number of farm ownership transfers per 1,000 of all farms, by main type of transfer, Illinois, 1926-1958 (year ending March 1). (Fig. 4)

This situation was drastically reversed during the 1940s. The number of forced sales decreased as prosperity came to agriculture, and voluntary sales and trades again increased and became the bulk of all transfers. The relatively constant land price level, in real (deflated) terms, as mentioned on page 6, is explicable if the high rate of transfers in the 'forties is seen in part as the aftermath of the depression and the high rate of forced sales in the 'thirties. The many forced sales led to an involuntary increase in the market supply of farmland. As long as the effects of this increase were felt, there was little tendency to bid up farmland in real terms. The abnormal conditions during a period of running inflation may also have contributed. Only to keep up with the declining purchasing power of money, land prices had to be raised every year. These increases in price may have been all that land buyers were willing to risk, since no one knew whether a period of deflation would follow the wartime boom.

In the 1950s, the rate of transfers fell far below the levels of the 'thirties and 'forties. Forced sales accounted for only a tiny fraction of all transfers. Voluntary sales and trades also fell sharply and accounted for only about half of all transfers or about the same magnitude as the relatively constant "other" categories. Since the 1950s, the

farmland market has not been fluid, but has been governed by the rigidly restricted market supply. Land buyers have reacted by bidding up land, even in real terms. Around 1960, there seemed to be a new reversal of trend, probably a stabilization of the level reached. However, it may yet be too early to judge the meaning of this.

Rates of transfer are given as per 1,000 of all farms. Thus the absolute figure corresponding to a certain rate has been declining as the number of farms decreases (from 230,000 in 1930 to 221,000 in 1940, 203,000 in 1950, and 176,000 in 1958).[1] Moreover, the significance of the rate depends in part on the relative proportions of sales of entire farms and of land parcels for farm enlargement.[2]

In the land market during the 'fifties, land purchases for farm enlargement were relatively more numerous than ever before. In many cases, the land parcels for farm enlargement were parts of previously existing farms which were divided at the time of transfer. In some other cases, they were isolated parcels changing hands between nonfarm investors (the "fleeting parcel market"). The rates of transfer in Figure 4, like the data on land sales used in this bulletin, refer to acquisitions of land rather than offerings. The rate of complete farm units being offered for sale probably fell even more sharply than the rate of purchases shown in the chart.

Sellers and buyers of farm real estate

To analyze the farm real estate market it is important to know who supplies land for sale. Data on sellers are available from market surveys since 1949. The number of sales in these surveys is quite small, however, and the data can be used only to show some main features.

Sellers were classified as active farmers, retired farmers, estates, and nonfarmers. During the 1950s there were only slight changes in the proportions between these categories. Active farmers accounted for upwards of one-third of all sellers, but their selling activities appeared to be somewhat less frequent in the later part of the decade. Retired farmers, on the other hand, accounted for 15 to 20 percent of all sellers and were somewhat more active later in the decade. Estates were one-fourth to one-third of the land sellers on the market and nonfarmers were from 15 to over 20 percent.

[1] The 1959 census enumerated 154,600 farms. The minimum criterion of a farm was, however, somewhat more restrictive than before.

[2] See Dollar Levels and Trends in Sales Prices, page 12.

Data on buyers from similar surveys show tenants to have declined in relative importance from one-third to one-fourth, while owner-operators (one-third and over) and nonfarmers have gained. Part owners, in this case, are included with owner-operators. And since part owners are an increasing proportion of all farmers in Illinois, such a shift in buyer categories was to be expected. The slight increase in the role of nonfarmers agrees with the most recent trend, shown by the censuses 1950-1959, toward somewhat more land under lease in Illinois.[1]

Financing land transfers

A restriction on the farmland market is in the mode of financing and the degree to which buyers are able (and willing) to obtain credit to finance a purchase.

Other recent survey data, available since 1944, show that the rising trend in value has been accompanied by an increasing tendency for land purchases to be credit financed. In the mid-forties, less than 40 percent of all sales were credit financed. The percentage rose through the late 1940s and has exceeded 50 percent since 1953. In the late 1950s, nearly two-thirds of all sales were credit financed, while the proportion was slightly lower (around 60 percent) in 1960-1961.

The average ratio of debt to consideration on credit-financed sales has risen somewhat in recent years. It remained below 50 percent throughout the 1940s and early 1950s, but has varied between 55 and 60 percent in the last few years.

Behind both of these movements is the emergence of a method of financing which previously was not much in use — installment land contracts. Although infrequently used in the early 1940s, contract sales accounted for between 5 and 10 percent of all farmland sales in Illinois in the later years of the same decade. During the 1950s, their share increased rapidly. In 1960 and 1961, more than one-fourth of all farmland sales in the state were by contract.[2]

[1] For data on owner-operated and tenanted land in 1959, see *Economics for Agriculture, Tenure and Appraisal,* TA 12, by F. J. Reiss, Univ. of Ill. Col. of Agr., Dept. Agr. Econ., 1962.

[2] On installment land contracts as a method of transfer of farmland, see R. Vern Elefson and Philip M. Raup, *Financing Farm Transfers with Land Contracts,* Minn. Agr. Exp. Sta. Bul. 454, 1961 (also, North Central Reg. Pub. 122). Also, see Fred L. Mann, *A Comparative Study of Laws Relating to Low-Equity Transfers of Farm Real Estate in the North Central Region,* University of Missouri Res. Bul. 782, 1961 (also, North Central Reg. Pub. 136).

Dollar Levels and Trends in Sales Prices

Sources of data and limitations

The commonly used indices of farmland price are based mainly on two types of data, both of which reflect the opinion of informed persons: census returns[1] and crop reporters' estimates.[2]

Both farmers and crop reporters draw on a variety of commonly available information which should allow them to closely determine the realities of the farmland market. The time series derived from these two sources (farmers and crop reporters) are also in fairly good agreement between themselves as regards the trend of change in farmland values. The absolute level of price, however, shows some difference between the two sources.

This measure of agreement does not show how close the estimates are to the facts. The two sources draw on the same information and may also influence each other. The crop reporters have access to the census results, and the farmers may know the opinions of the crop reporters in their districts. This does not, however, invalidate any of the major findings on long- or medium-term trends in price change. But for short-term trends and detailed analyses, a source of information is needed that is independent of opinion data and that more directly reflects actual sales prices of farms.

In this report land sales data from 1952/53 through 1956/57 are used to show the character of the farmland market. Nearly 16,000 sales were analyzed, involving 1¼ million acres of farmland, sold for an aggregate price of about $265 million. (For detail on the data and their treatment, see Appendix A.)

[1] The Census of Agriculture, taken every five years, asks farmers (among many other things) about the market value of their farms. Since 1950, the question on farm sales value has been asked only on a sample of approximately 20 percent of all farms. The rate of response to this question is high, but it is far from 100 percent. In 1954, the rate of response in Illinois was 77 percent of the sample farms; thus, about 15 percent of all farm operators had answered this question. This results in possible sampling errors, even apart from any general tendency among farmers to understate or overstate the value of the farms they operate.

[2] The crop reporters in each of the nine crop-reporting districts in Illinois estimate the current average selling value of farmland three times a year. They base their opinions principally on sales of farmland in recent months before each estimate. They also try to assess the influence of individual factors, such as soil productivity, on the selling price and to adjust for these in estimating what land of average quality would sell for. Separate estimates are made for land with and without buildings.

Table 1. — Sales and Acres Sold by Size of Tract, 1952/53–1956/57

Size class in acres	Number of sales	Acres sold	Size group as percent of total[a]	
			Number of sales	Acres sold
Under 3	174	488	1.1	.04
3–9	924	5,382	5.8	.4
10–29	2,035	36,824	12.9	2.9
30–49	3,433	134,187	21.8	10.6
50–69	1,244	72,558	7.9	5.8
70–99	3,604	291,018	22.8	23.1
100–139	1,790	207,873	11.3	16.5
140–179	1,545	243,622	9.8	19.3
180–219	477	94,053	3.0	7.5
220–259	281	66,848	1.8	5.3
260–379	223	68,125	1.4	5.4
380–499	40	16,650	.3	1.3
500–699	22	12,555	.1	1.0
700–999	7	5,385	0	.4
1,000–4,999	4	5,352	0	.4
5,000 and over	0	0	0	0
Total, all sizes	15,803	1,260,920	100[a]	100[a]

[a] Detail may not add up to exactly 100 because of rounding.

General characteristics as to size and level of prices per acre, all sales

Sales were distributed by size in acres as shown in Table 1. The average size of tract per sale was nearly 80 acres, less than half the average size of farms in Illinois (173 acres) at the time of the 1954 Census of Agriculture. The largest group of sales, both in number and acres transferred, was the size group 70-100 acres, comprising close to 23 percent of both. The second largest group in terms of numbers was 30-50 acres. High percentages of acreage were found also in the groups 100-140 and 140-180 acres. Sales of large farms were relatively few. The consequence of this on the analysis of the parcel market versus the whole-farm market will be discussed later.

Average price varied with the size of tract in a manner inconsistent with the per-acre values by size of farm shown in the 1950 and 1959 Censuses of Agriculture.[1] The census valuations do not reflect much relationship between size and per-acre value. Only the smallest sizes had values higher than the general average, evidently because of the greater importance of buildings. The sizes between 140 and 500 acres

[1] The 1954 census did not report per-acre values by size of farm.

(which have the bulk of the farm acreage) all had values close to the general average, while the sizes above 500 acres had lower values. Those between 50 and 140 acres showed lower values in 1950 but not in 1959. When differences in cropland percentage were taken into account these differences largely disappeared; then all size classes above 50 acres — including the largest farms — were close to the average.[1]

The sales prices show a more complex pattern (see Appendix Table 4). Taken without further analysis, they would indicate (among other things) that the largest tracts sold for average prices below the average value of large farms in 1950, while at the same time the general (unweighted) average rose by 20 percent between 1950 and 1954. In the group over 1,000 acres, this might be fortuitous since there were only four sales. But there were 29 sales in the group 500-1,000, index 84, and 263 in the group 260-500 with index 94. In the groups 180-220 and 220-260 acres, with indices well below average, the number of sales was also substantial. Data by areas within the state show analogous traits.

Despite the substantial number of sales, the low average prices in these groups cannot be accepted as characteristic of the value of all farms in the same groups. The discussion above revealed the effect the percentage of cropland had on the values reported in the census. The most logical interpretation of the low values of large farms in the sales data is that they reflected lower cropland percentages in the large farms sold as units than among the universe of farms in the same size group. To some extent, this variation in price by size of tract was influenced by the distribution of sales between areas of the state.

Straight average sales prices per acre by counties for all five sales years in the sales data, in comparison with the county average values in the 1954 census, are shown in Appendix A, Figures 13 and 14. The two series of data are in fairly close agreement. Only about 15 counties showed more than 20 percent difference. Among these counties, the sales value was higher than the census value in more cases than it was lower. These upward deviations included a number of counties with strong urban influence, such as Du Page, Lake, St. Clair, and Madison. This could be expected, since urban influences on the land values were more likely to be reflected in market sales than in farmers' responses to a census question. Otherwise, there is a reasonably close correlation between sales prices and census values.

[1] For this adjustment, average value per acre was multiplied by average total acreage per farm in the size group, and this total value was divided by average cropland acreage per farm in the size group.

When the farm acreages in each county were used as weights, the state average of sales prices was increased from $211 to $239 for all five sales years combined. For sales year 1955 (April 1954-March 1955), which corresponded most closely to the 1954 census, the average weighted by county farm acreages was $234.5 (against $220 as the unweighted average for the same year).[1]

This is encouragingly close to the census data. The average in the 1954 census was $231.47. Data from the USDA, based on censuses, crop reporters' estimates, and other sources, indicate $242 as average for the years 1953 to 1957. Apparently, the census is quite good as a source of knowledge about land values.

County averages were weighted also by township farm acreages. (See Farmland value areas in Illinois, page 34, and Appendix A.)

In some cases, as in the northeastern counties, it is quite clear that sales for nonagricultural uses have raised sales prices above those that apply to farmland. The same explanation applies to some extent also in southwestern Illinois (East St. Louis, Carbondale). However, several counties in this area had sales prices very much above the census level. These included rural counties like Clinton, Washington, Perry, and Union. It is, therefore, probable that the census values were actually on the low side in these parts of the state, for one reason or another.[2] West-central Illinois, with very nearly the same level in all the data, is probably the most purely agricultural part of the state.

The time series and the census data

The time series of state data are shown in Table 2, data for each of the areas in Figure 5. Sales data weighted by county farm acreages from the five sales years were compared with census averages from 1950, 1954, and 1959.

[1] The five-year average was rather close to the center year (1955) average. This is of interest as a condition for analyses based on all five years added together. Analyses where township data are used must perforce utilize totals for all five years, since yearly sales in a township are often very few.

[2] In certain counties the deviations of sales prices from the 1954 census average were such that substituting the sales prices for census values in a comparison with 1959 census data would eliminate extremes in the price trend from 1954 to 1959. Thus, for instance, Massac County had sales price averages of 157 (unweighted) or 160 (weighted) percent of the 1954 census average; the apparent intercensal value increase from 1954 to 1959 was 84 percent. That is more than twice the statewide average value increase between the censuses (39 percent). Conversely, Scott County, for instance, had a sales-to-census ratio as low as 76-74, and a value rise for 1954-1959 of only 4 percent. These may be individual indications of weak spots in the 1954 census. There were, however, also cases to the opposite effect, such as in Putnam and Schuyler counties, and a scatter diagram failed to show any statistically significant relation between the sales-to-census ratio and the 1954-1959 value increase.

Table 2. — Dollar Levels and Index Numbers, 1952/53–1956/57

Sales year	Value per acre			Index numbers[a]		
	Sales values		USDA estimates	Sales values		USDA estimates
	Unweighted	Weighted[b]		Unweighted	Weighted[b]	
1953.....	$181.70	$222.60	$225.70	86.1	93.3	93.1
1954.....	196.60	227.70	229.70	93.1	95.4	94.8
1955.....	220.00	234.50	233.55	104.2	98.2	96.3
1956.....	224.40	243.40	248.50	106.3	101.9	102.5
1957.....	233.40	265.20	274.65	110.3	111.1	113.3
Average[c]...	211.20	238.70	242.40	100.0	100.0	100.0

[a] Using the average of the five sales years as base = 100.
[b] By farm acreage in each county, 1954 census.
[c] Unweighted average of the five yearly figures.

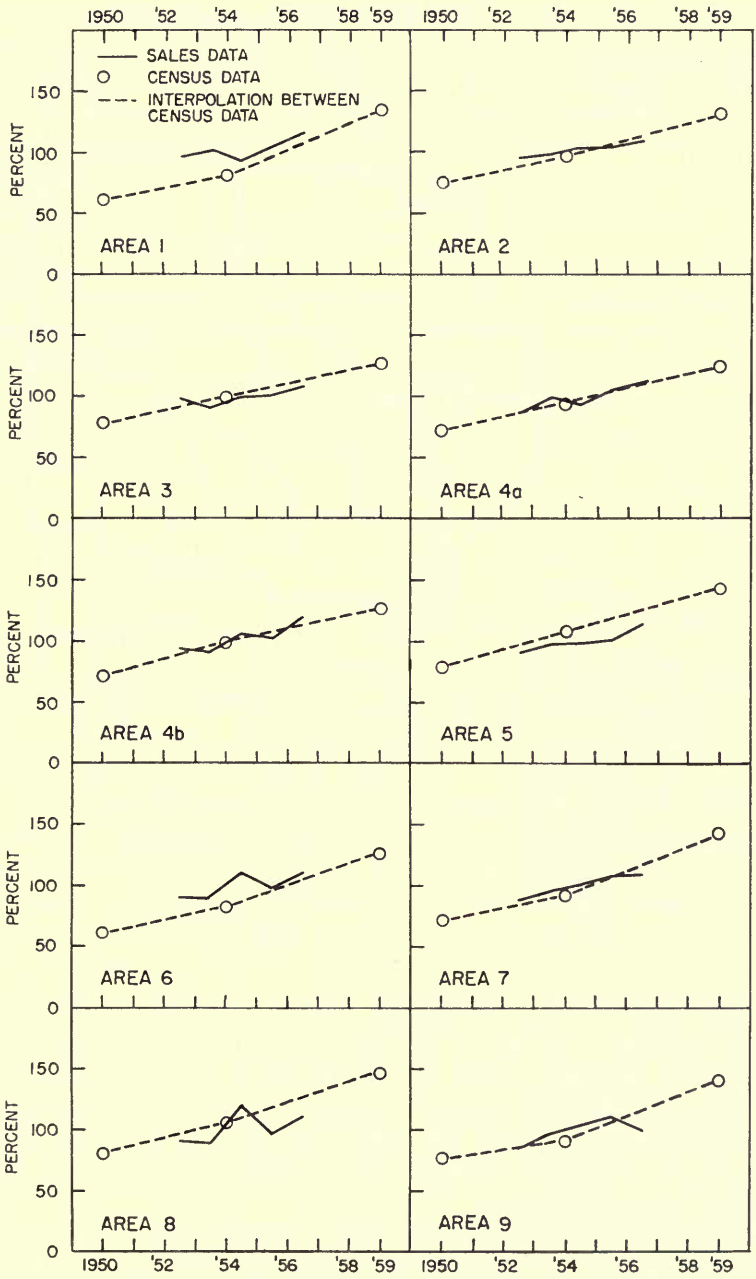
The area weighting has considerably increased the agreement between the sales values and the USDA estimates, as indicated in Table 2. This applies to all the dollar figures. The change from 1953 to 1955 was greater in the sales data than in the USDA estimates. It represented, however, less than two-fifths of the difference between the census averages of 1950 and 1954. This confirms that there was a lull in the price movement from 1953 to 1955, even though perhaps somewhat less marked than indicated by the USDA figures. The change in the sales data from 1955 to 1957 was almost exactly two-fifths of the difference between the average values in the censuses of 1954 and 1959. The index numbers also showed greater agreement when the weighted sales data were compared with the USDA estimates.

In most areas, the trend of census averages forms an almost straight line. And in most areas, the sales averages also can be interpreted as representing the same trend and level as indicated by the census data.

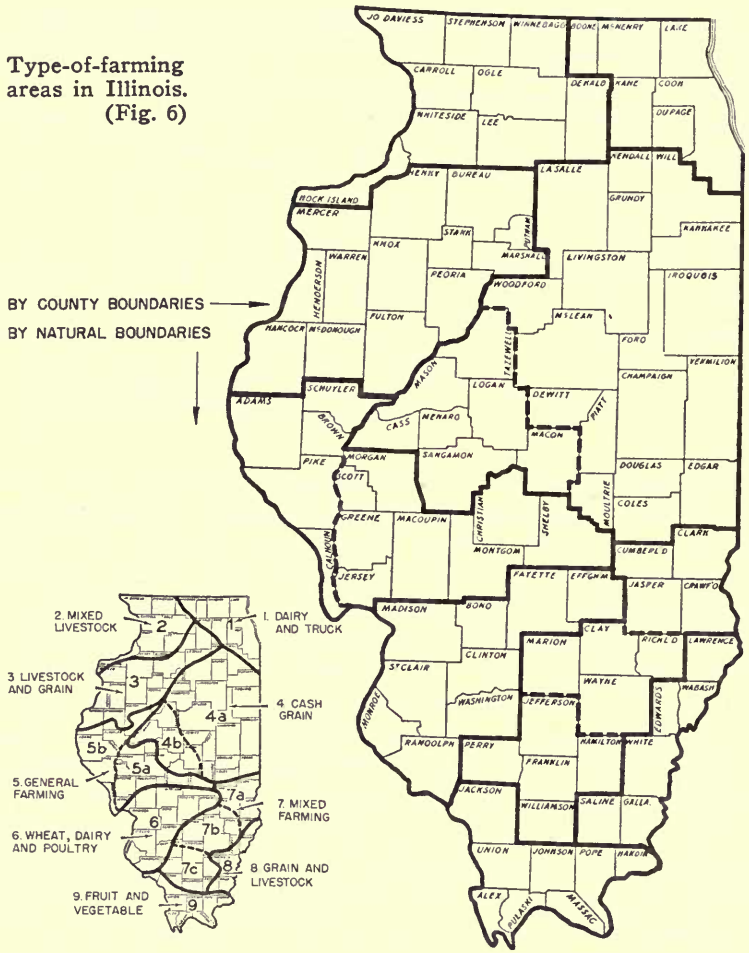
More sizeable divergencies were at hand in two or three areas. In area 1, which consists of a few counties to the north and west of Chicago, the sales data indicate that the census trend between 1950 and 1954 ought to be curvilinear. That is quite possible in view of the influence from a large urban land market.

On the whole, these observations confirm that the census data and the sales data were in rather close agreement. Such differences that occurred were in most cases moderate and may well have depended on the size of the sample.[1]

[1] The number of sales in an area in a given year tends to be between 200 and 300, but this frequency varied sufficiently to permit incidental circumstances to influence some of the averages.



Index numbers of the sales data, five-year averages, and census data, 1950, 1954, and 1959, by type-of-farming areas. In each area the sales data average for five years (1952/53-1956/57) is the base = 100. (Fig. 5)



This measure of agreement does not extend to the direct crop-reporter estimates as far as the level of price is concerned. The crop-reporter estimates, which are not published as dollar figures but used as a basis for index numbers, showed on the whole a somewhat higher price level than both the census and the sales data. As index numbers, the crop-reporter estimates were closer to the sales data than they were as absolute figures.

The period covered by the sales data contained only a part of the decennial change from 1950 to 1960, and precise differences of trend between areas were hard to pin down. Over the longer run, since 1910 for example, census data indicate that the value movements in

the type-of-farming areas have been rather parallel and on the whole similar to that of the state (Fig. 1). Marked differences between areas occurred principally in the latter half of the 1950s.

For the state as a whole, the price level (in current dollars) rose about 65 percent in the period 1950-1959. Rates of increase not very far from the average were found in most areas of northern and central Illinois. Higher rates (doubling or more) were seen in the Chicago area and most of southern Illinois.

Price differentials between improved and unimproved properties, by size class

More than two-thirds of the farmland parcels in the sales data were classified as improved with buildings, and these included over four-fifths of the acreage transferred in these bona fide sales. The totals are as follows:

	Number of sales	*Acreage sold*	*Average size of tract, acres*
Improved tracts	11,956	1,036,823	87
Unimproved tracts	3,847	224,097	58
Total	15,803	1,260,920	80

The average price was higher on improved than on unimproved tracts. The unweighted average price was $217 on the former and $184 on the latter. To understand this, some differences in structure between the two groups of sales should be noted.

Sales classified by improvement class and size class are shown in Table 3. Unimproved tracts were smaller on the average, showing a more marked preponderance for the size groups 30-49 and 70-99 acres. This is as could be expected, since these classes consisted almost entirely of land parcels intended to be added to existing farms. There were only 48 sales of unimproved tracts above 220 acres in size.

Separate average prices by improvement class and by size class are shown in Table 4. Both improvement classes showed the same trend of highest price in the smallest size classes, the price falling thereafter as size increased. This trend was interrupted by markedly higher prices in the size class 70-99 acres than in the preceding class and also, among the improved tracts, in the size class 140-179 acres. One possible explanation for this interruption might be that parcels of these sizes were placed on the market relatively often because of subdivision at the time of sale of farms having a high per-acre value. The price difference was moderate, however, and the average prices in these sizes still did not fully reach the weighted average based on

Table 3. — Percent Distribution of Improved and Unimproved Tracts, by Size Class, 1952/53–1956/57

Size class in acres	Percent distribution of			
	Number of sales		Acres sold	
	Improved	Unimproved	Improved	Unimproved
Under 3	1.3	.5	.04	.03
3–9	6.6	3.6	.4	.4
10–29	10.9	19.1	2.2	6.1
30–49	17.5	34.7	7.9	23.2
50–69	7.7	8.4	5.2	8.4
70–99	23.0	22.0	21.5	30.3
100–139	13.2	5.6	17.6	11.1
140–179	11.7	3.9	21.3	10.3
180–219	3.6	1.0	8.3	3.4
220–259	2.2	.5	6.0	2.2
260–379	1.7	.5	6.0	2.8
380–499	.3	.1	1.4	.7
500–699	.2	.02	1.2	.3
700–999	.04	.05	.4	.7
1,000 and over	.03	0	.5	0
Total,[a] all sizes	100	100	100	100

[a] Detail may not add up to exactly 100 because of rounding.

county farm acreage (page 15). The explanation may well be, therefore, that these parcel sizes were somewhat more frequent in high-value than in low-value areas.

The price of unimproved land was a relatively small percentage of the improved land price in the lowest size groups, and thereafter rose with increasing size. This should thus reflect the decreasing share of buildings in the total farm value (Table 4, column 5).

Less easy to anticipate is the fact that this value ratio climbed to 90 percent and over in the size classes between 30 and 100 acres, and then went down again. A clue to this may be in the assessment of land and buildings on improved land. Building assessment usually is 20-30 percent of total value, and the same or even higher ratios are applicable to properties between 30 and 100 acres. The closeness of the prices paid for unimproved and improved land in these size classes rather indicates, then, that the presence of buildings in these size classes was of little concern to buyers, most of whom bought land to enlarge an existing farm.

The price ratios on larger farms, on the other hand, showed more difference between improved and unimproved land than would be expected from the ratio of building assessment to total assessment, which is often quite low in these size groups. The decrease in price per acre with increasing size of tract was sharper on unimproved than on im-

Table 4. — Average[a] Price per Acre of Improved and Unimproved Land, by Size Class, 1952/53–1956/57

1 Size class in acres	2 All sales	3 Improved tracts	4 Unimproved tracts	5 Col. 4 as percent of col. 3
Under 3	$2,824	$3,067	$983	32
3–9	1,364	1,500	629	42
10–29	272	297	228	77
30–49	197	204	184	90
50–69	189	192	181	94
70–99	223	227	213	94
100–139	195	200	163	82
140–179	220	228	148	65
180–219	190	195	129	66
220–259	202	206	144	70
260–379	170	180	69	38
380–499	145	155	...[b]	...[b]
500–699	154	145	...[b]	...[b]
700–999	...[b]	...[b]	...[b]	...[b]
1,000 and over	...[b]	...[b]	...	...
Average[a]	211	217	184	85

[a] Unweighted averages.
[b] Less than 10 sales.

proved land. This might be explained if the tendency to subdivide the better tracts at the time of sale and to sell the less fertile ones undivided is assumed to be more marked on unimproved land than on land with buildings.

The over-all ratio of building assessment to total assessment of improved land in the sales material was close to 22 percent. This is not altogether inconsistent with the ratio between value of improved and unimproved land shown in the table. If unimproved land sells for 85 percent of the price for improved land, this would indicate an average building value of 15 percent of the value of the improved properties. The difference against the building-assessment ratio may be explained, as discussed above, by the fact that buildings become superfluous in many farm enlargement situations.

Size of tracts sold in relation to size of farms — the parcel market versus the whole-farm market

The proportion of farmland sales that were for farm enlargement can to some extent be gauged from the sales data. The size distribution of sales permits certain comparisons with census data to show how the rate of transfers relates to the rate of disappearance of farms in the process of farm enlargement.

Table 5. — Size Distributions of Sales and Intercensal Changes in Farm Numbers by Size of Farm

Size class in acres	Number of sales, 1952/53–1956/57	Change in farm numbers, 1950–1954	Change in farm numbers, 1954–1959	Intercensal change in farm numbers as percent of number at beginning of intercensal period	
				1950–1954	1954–1959
Under 3	174	+ 679	−4,980[a]	+25.5	−44.4[a]
3–9	924	−3,463		−30.5	
10–29	2,035	−3,816	−3,215	−24.3	−14.7
30–49	3,433	−2,267		−18.5	
50–69	1,244	−1,644	− 920	−19.3	−13.4
70–99	3,604	−3,416	−3,029	−16.6	−17.7
100–139	1,790	−4,090	−4,520	−16.4	−21.6
140–179	1,545	−3,355	−5,701	−10.6	−20.1
180–219	477	− 961	−2,568	− 5.0	−13.9
220–259	281	+ 124	− 985	+ 0.8	− 6.0
260–499	263	+1,851	+3,185	+ 6.7	+10.8
500–999	29	+ 615	+1,686	+15.8	+37.4
1,000 and over	4	+ 18	+ 148	+ 4.4	+34.7
Total, all sizes	15,803	−19,725	−20,899[a]	−10.7	−11.9[a]

[a] Partly because of change in definition of a farm.

The number of bona fide sales by size of tract in the five-year period under study is shown in Table 5 in comparison with the changes in farm numbers in the census periods 1950-1954[1] and 1954-1959.

The total disappearance of farms was larger than the number of bona fide sales. Changes in farm numbers were, of course, also influenced by the market for farmland rentals. Bona fide sales, moreover, were only a part of the transfers — in fact, less than half. The total number of transfers in these five years was around 35,000, or less than twice the disappearance of farms in each of the two five-year intercensal periods.

This point needs further clarification. When two small farms are added together, it usually leads to a diminution by two in the number of farms in the lower size classes and to the addition of one unit to a higher size class. Thus there is a net disappearance of one. When entire farms are bought and added to existing farms, the diminution in farm numbers should equal the number of such transactions. If a farm is enlarged by buying two or more other farms to add to the existing one, the total disappearance of farms would still equal the number transferred for such purpose.

[1] The 1950 census was taken April 1, the 1954 census in November. The intercensal period was thus closer to five than to four years.

On the other hand, when a large farm is sold as several parcels which are used for enlarging existing farms, only one farm would disappear in the total, although several others become larger (that is, several units are subtracted from lower and added to higher size groups). The rate of transfer (that is, of purchase) will be higher than the rate of disappearance of farms.

The total number of all transfers in a five-year period, or 35,000, may be compared with the rate of farm disappearance in a five-year period, or about 20,000 (possibly somewhat less because of change in definition). The rate of transfers of entire farms continuing as entire farms would thus be approximately 15,000 or less.

Both in 1950-1954 and in 1954-1959, farms above 140 acres in size diminished in number. In other words, the rate of disappearance of medium-sized farms was higher than the rate of increase among the large farms. In 1950-1954, the number of farms between 140 and 220 acres diminished by 4,316, while those over 220 acres increased by 2,608. In 1954-1959, farms between 140 and 260 acres decreased by 9,254 units, while those over 260 acres increased by 5,019. Thus, even medium-sized farms were enlarged. Also, many of them were used for farm enlargement, either by being added undivided to an existing farm or by being subdivided into smaller parcels. When subdivided, they show up in the sales material among the smaller size groups.

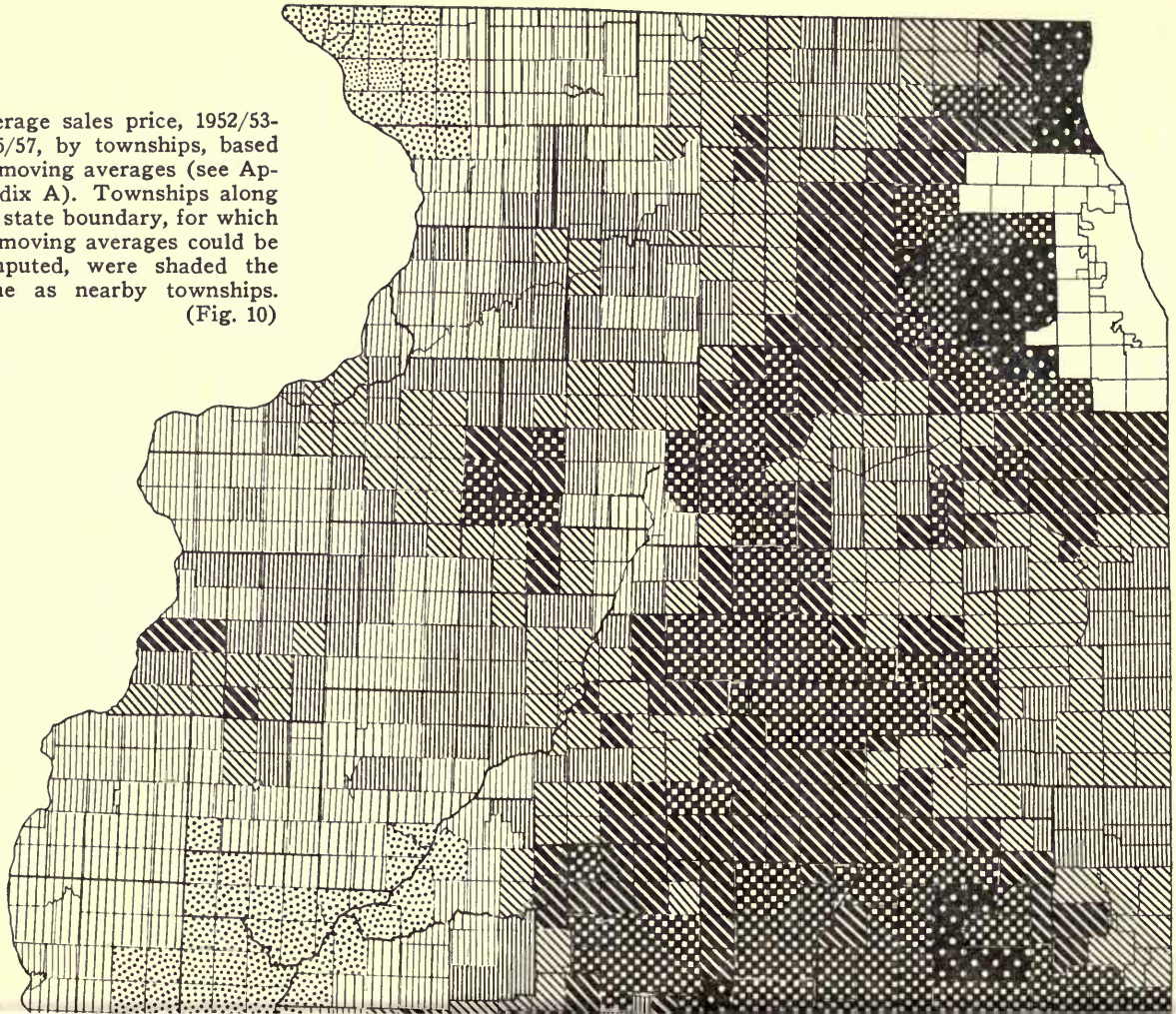
If it is accepted that out of 35,000 transfers some 20,000 (or rather more) were for farm enlargement, and 15,000 (or less) for continued existence as farms, then it is clear that rather more than half the bona fide sales must have been for enlargement purposes. The proportion is likely to be tilted towards enlargement purchases among the bona fide sales, since family transactions would tend to maintain farms as undivided somewhat more often.

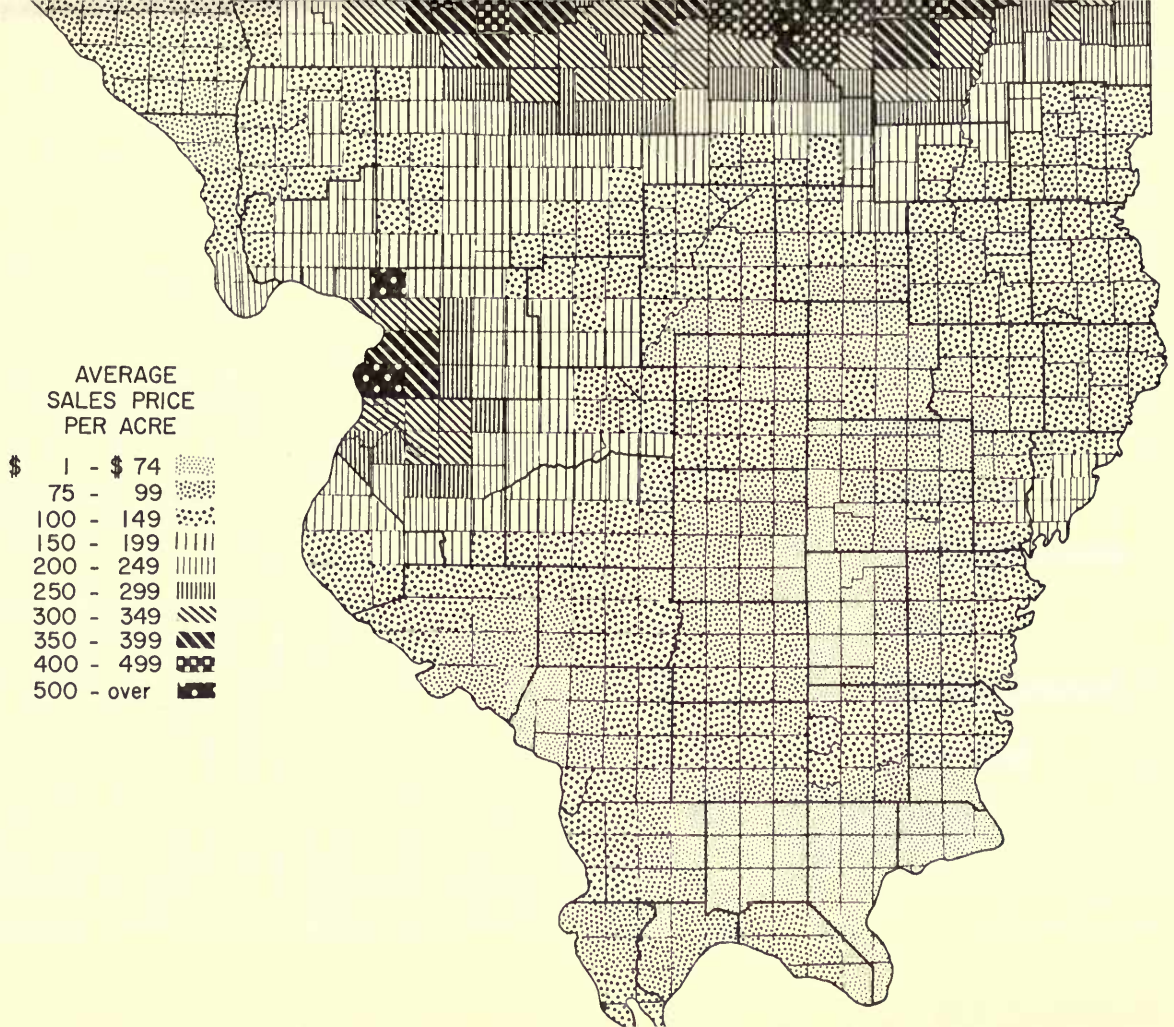
This conclusion is supported also by the size distribution of sales (see Figure 7 for the state as a whole and Table 6 for type-of-farming areas). Most of the sales were in the small size classes, those in which farms are getting fewer. Only a few hundred sales were in the size groups where farm numbers are increasing. Over 11,400 (72 percent) were under 100 acres in size.

As far as numbers of transfers are concerned, the sales data reflect, above all, the parcel market.

As regards area, the proportions are, of course, different. Sales of tracts under 100 acres accounted for 43 percent of the acreage in the sales data, and tracts 100-220 acres in size accounted for another 43 percent, leaving barely 14 percent in the sizes over 220 acres (see Table 1). In the 1954 census, these three main groups occupied 8, 35,

Average sales price, 1952/53-1956/57, by townships, based on moving averages (see Appendix A). Townships along the state boundary, for which no moving averages could be computed, were shaded the same as nearby townships. (Fig. 10)




AVERAGE
SALES PRICE
PER ACRE
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100 - 149
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200 - 249
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350 - 399
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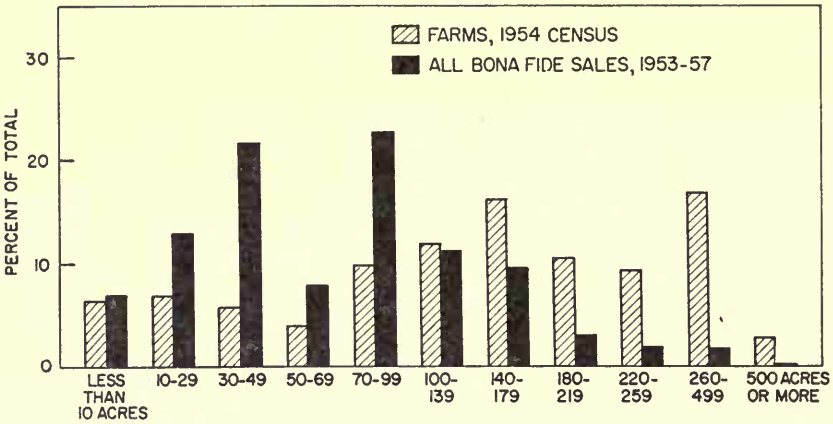


Distribution of farms and sales of farm real estate by size class, Illinois. (Fig. 7)

Table 6. — Number of Tracts Sold by Size as Percent of Farm Number (1954 Census) in Each Size Class, 1952/53–1956/57

Size class in acres	Type-of-farming area					
	1	2	3	4a	4b	5
				percent		
Under 10	20.5	6.4	4.5	7.5	13.6	9.1
10–29	18.7	11.3	11.1	17.3	25.0	19.2
30–49	30.2	24.2	30.2	39.7	37.7	41.1
50–69	10.1	18.3	20.4	20.6	26.4	21.8
70–99	18.9	15.1	23.5	24.8	30.2	24.9
100–139	7.5	8.0	7.5	6.7	11.0	12.3
140–179	6.2	5.6	6.3	4.3	5.1	7.4
180–219	4.3	2.8	3.0	1.3	2.9	3.7
220–259	3.3	2.6	1.4	.6	2.2	2.6
260–499	1.8	1.4	2.4	.4	1.1	1.0
500 and over	0	0	...[a]	.5	...[a]	1.5
All sizes	10.7	6.8	7.8	6.6	9.2	10.8

Size class in acres	Area 6	Area 7	Area 8	Area 9	All areas
Under 10	13.9	11.9	8.8	16.4	16.9
10–29	16.3	19.9	17.3	23.0	17.1
30–49	38.6	38.3	31.5	27.0	34.3
50–69	18.6	18.4	14.0	12.7	18.0
70–99	21.2	19.2	15.5	15.9	21.0
100–139	9.3	8.4	7.2	15.8	8.6
140–179	4.9	4.4	4.3	8.3	5.4
180–219	2.3	2.2	3.0	4.3	2.5
220–259	1.3	1.5	...[a]	5.4	1.7
260–499	.7	.8	...[a]	1.7	.9
500 and over	0	...[a]	0	...[a]	.7
All sizes	10.0	12.6	9.8	13.2	9.0

[a] Small number (less than 10 sales).

and 57 percent, respectively, of all the farm acreage in Illinois. The rate of transfer of land within each of these groups would appear to be 20 percent for farms under 100 acres, 5 percent between 100 and 220, and 1 percent among farms above 220 acres. The over-all rate of transfer through bona fide sale was around 4 percent during the five-year period.

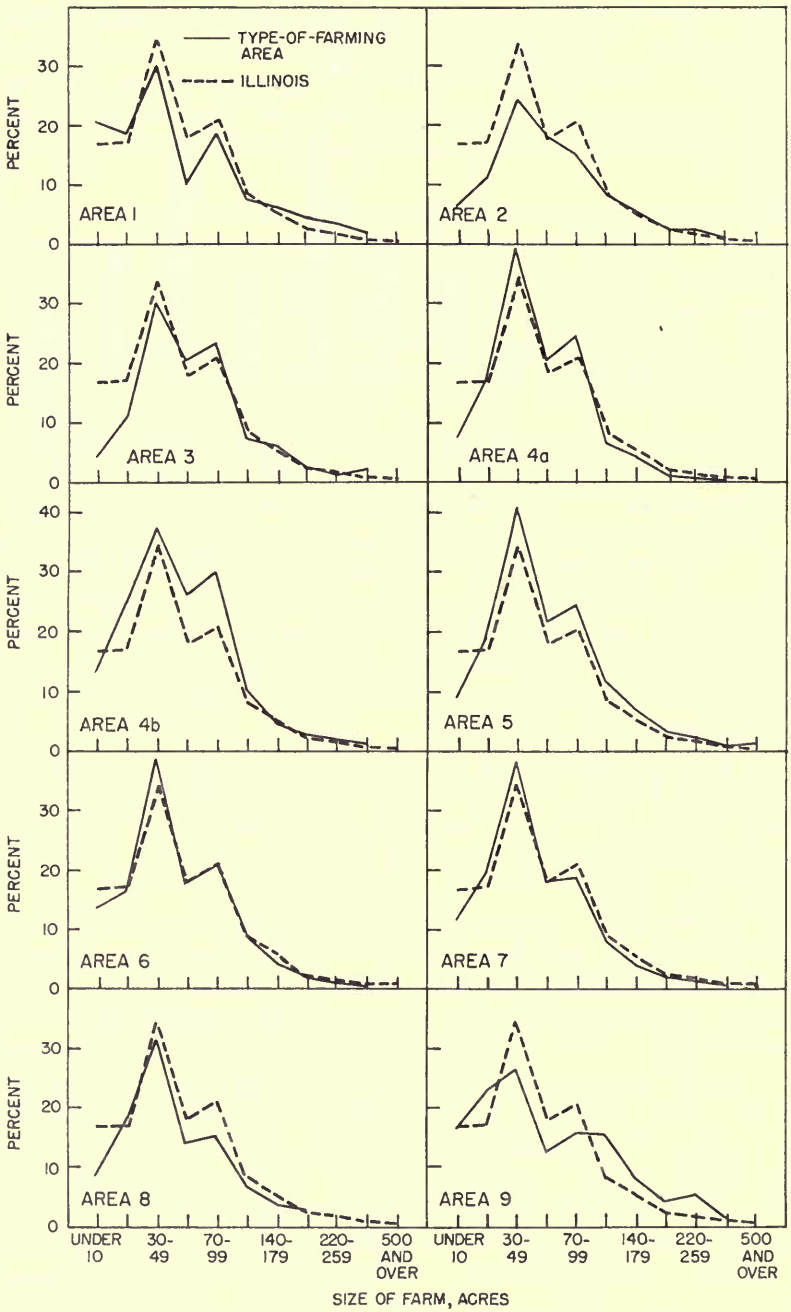
These data confirm that the parcel market was preponderant among tracts under 100 acres in size but still important among the medium-sized ones up to about 160 acres. Rather more than half the acres sold must have been bought for farm enlargement purposes.

This does not reveal the extent to which the parcel market was fed by sales of undivided small- and medium-sized farms going out of existence as farms and by sales from the subdivision of medium-sized and large farms. The more subdivision that took place the more of the whole group of bona fide sales was likely to be parcels rather than farms at the time of transfer, leaving so much the less for transfers of entire farms.

The proportion between improved and unimproved properties (see discussion, pages 19-21) gives some clue, if rather an incomplete one, to the extent of the parcel market. Many properties bought for farm enlargement had buildings either because they were farms going out of existence or because they carried the buildings of a farm that was subdivided at the time of sale.

The preponderance of the parcel market was more noticeable in some parts of the state and less in others. Figure 8 shows the number of sales, by size of tract, as percent of the number of farms (1954 census) in each size group, comparing each type-of-farming area with the state as a whole.

There were some marked differences between areas. To understand these properly, one should also note the differences in frequency of sales between areas. The most striking differences relate to the dominance of parcels of 40 and 80 acres in size, respectively, which showed up as two more or less marked peaks on all the charts. Areas 4, 5, 6, and 7 had higher frequencies of sale in these groups than the state as a whole, while the opposite was true in areas 1, 2, 8, and 9. Area 3 had a higher frequency among 80-acre tracts and a lower one among 40-acre tracts. In areas 6 and 7, the differences compared with the state averages were moderate, however, also as regards the frequency of transfer of larger tracts, notably those of 140-180, 180-220, and 220-260 acres, respectively. As regards these larger sizes, most areas were close to the general average. The exceptions were areas 1 and 9 with higher rates of transfer than average, and area 4a with markedly lower ones.



Number of tracts sold by size as percent of the number of farms (1954 census) in each size group. (Fig. 8)

The parcel market was particularly important in area 4, the high-value, cash-grain area in east-central Illinois. It was least dominant in the two extremes, areas 1 and 9, which also had most transfers in the sizes that can be assumed to be entire farms. In both cases, the reasons were rather outside agriculture. In area 1, whole farms were bought up for future development into urban property. This is done with or without an intervening waiting or ripening period when the land may be used as a temporary investment, such as for tax hedging or for intensive urban-fringe farming. Area 9 is a small area with several irregular features, including some of the least productive soils in the state.

When the two extremes in areas 1 and 9 are accounted for, the remainder of the state falls into a definite pattern. The parcel market is most active in the cash-grain area, where farm enlargement requires additional land and building values are low in relation to land values. It is least active in areas 2 and 3, where the dominant systems of livestock farming make it possible to enlarge the farm business by purchasing feeder cattle and stock feed, rather than by purchasing additional land. At the same time, the higher building values tend to make the farm size pattern more rigid. Areas 5, 6, 7, and 8 are, as expected, intermediate in activity since these are areas of mixed farming with less tendency for any one farm type to dominate.

Price variation by size of tract and range of price

It has long been observed that smaller acreages tend to sell for higher prices than larger tracts. In part this might result from the presence of relatively more buildings on smaller farms. The main explanation usually offered is that small- or medium-sized parcels are wanted for enlargement of existing farms. Farmers might be willing and able to pay more for additional acres to increase the size of their farms than they would and could pay, per acre, for a whole farm. That farms are gradually being built up to larger sizes should then lead to premium prices being paid on the parcel market.

The sales data show considerable variation in average price by size of tract, with lower than average prices being paid per acre for tracts exceeding 260 acres, and higher prices for tracts under 30 acres. (See pages 13-15 and Appendix Table 4.) It was also shown that part of this variation is likely to be due to the way in which many sales took place (pages 19-20). Farms of high per-acre value are more likely to be subdivided at the time of sale and thus show up in the sales among the smaller size groups, and vice versa.

Table 7. — Net Regression Between Size of Tract Sold and Price per Acre, by Type-of-Farming Areas,[a] 1952/53–1956/57

Area	Change in price per acre increase in size[b]	Price per acre, all sales[c]	Col. 2 as percent of col. 3
1	$-.716	$349.6	.20
2	-.356	243.1	.14
3	-.179	241.2	.07
4a	-.350	346.4	.10
4b	-.357	297.7	.12
5	-.258	161.6	.16
6	-.122	143.6	.09
7	-.186	101.0	.18
8	-.350	118.0	.30
9	-.170	74.8	.23

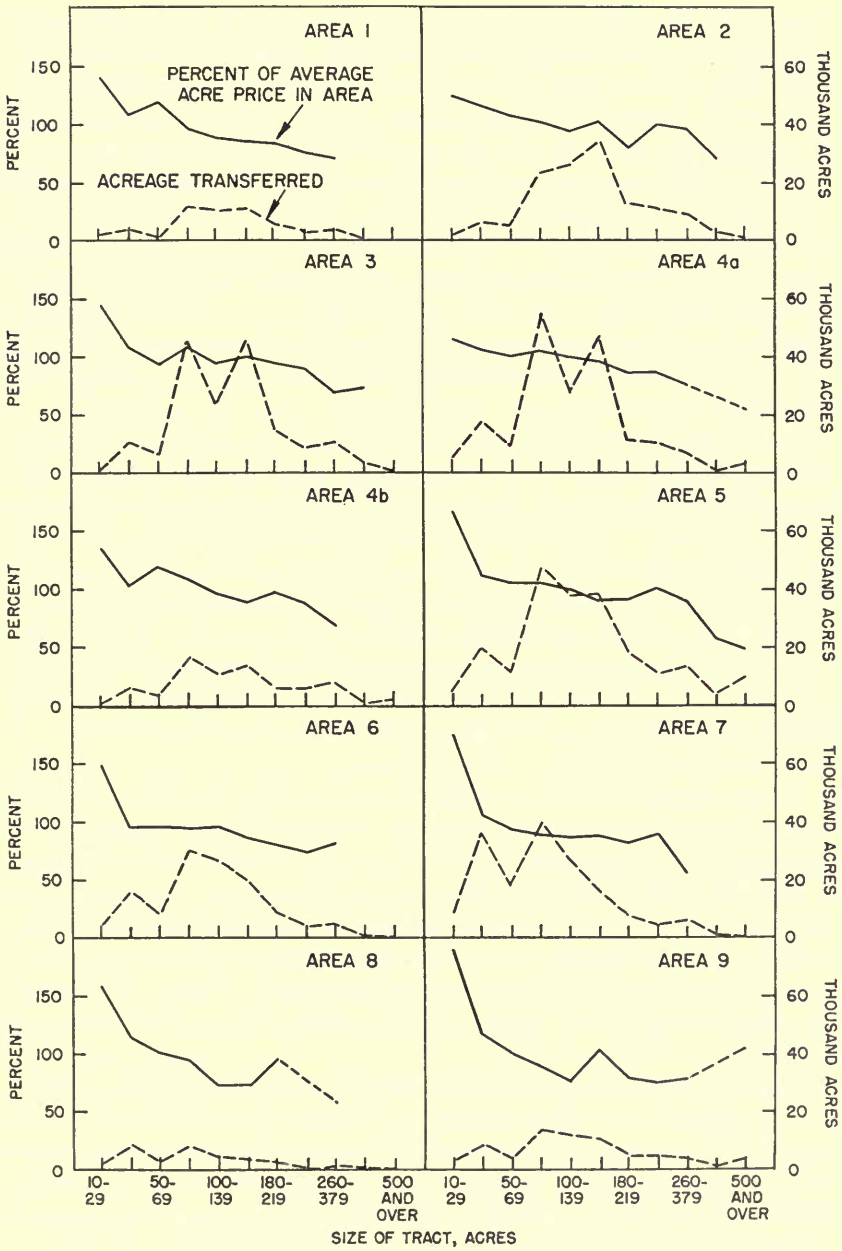
[a] Only two variables were used in this equation — size and price. The assumption of linearity is not contradicted by the data as presented in Figure 9.
[b] Refers only to tracts between 30 and 220 acres in size.
[c] Unweighted averages.

This question can be explored a little further by using data for state type-of-farming areas. Average price per acre by size of tract (unweighted averages) is shown in Figure 9 as percent of the general average in each area. To show which price levels represent considerable or only small acreages, the acreage transferred in each size class in the area is also entered on each chart.

The strongest deviations from the average are at the beginning and the end of each chart; that is, they are among the smallest and the largest tracts, both of which usually represent only a very small fraction of the total acreage transferred.

Even among the middle sizes, however, there are some differences. To further illustrate such differences, coefficients of net regression were computed and related to the price level in each area (Table 7), limiting the calculation to tracts between 30 and 220 acres. The indicator in the last column shows the average relative effect of variation in size. For instance, in area 4a, a 10-acre increase in size should be accompanied by a fall in the price per acre of 1 percent; an increase in size by 100 acres should be associated with a 10-percent decrease in price per acre, and so on.

A striking conclusion comes out with regard to the parcel market, as discussed in the preceding paragraph (see particularly Figure 8). The lowest indicators of price variation with size are in areas 3, 4a, 4b, and 6. The latter three, as was shown, have a more pronounced parcel market than the state as a whole, while area 3 is rather intermediate.



Price per acre and acres sold by size of tract and type-of-farming area, Illinois. (Fig. 9)

Conversely, the highest indicators are in areas 1, 8, and 9, where the whole-farm market was more preponderant. This is remarkable since tracts under 30 and over 220 acres were excluded from the equation.

Thus it appears that the relation between size and price is not particularly linked to the occurrence of an active parcel market.

The relatively wide variation in area 5, which appears to be in contrast with this finding, can be shown to depend largely on the heterogeneity of the area. When separate charts were drawn for areas 5a and 5b, the central part (50-260 acres) of these charts became much more horizontal than on the chart for the whole of area 5. The sharper slope for area 5 was thus caused by the fact that the sub-area (5b) with the lower average price carried relatively more weight in some of the higher size classes.

This gives a clue which may explain much of the other variations. Areas 8 and 9 are relatively heterogeneous in their soil quality; fertile bottomlands are averaged together with some of the poorest prairie and forest soils in the state. By contrast, areas 3, 4a, and 4b are among the more homogeneous in the state. Area 1 needs no such explanation, since values are to a high degree determined by nonagricultural factors.

These circumstances indicate that the simple relation between size and price is in a large measure spurious. Even though it is formally significant in a statistical sense, it may still not hold when all other factors are equal. Thus it might not be a significant consideration in farmland appraisal.

When discussing these averages, it must not be forgotten that they are averages of a very wide variation. Appendix Tables 5 and 6 give examples of this variation in price per acre by size of tract for areas 4a and 7b, respectively. In both areas the prices in a given size class varied to such an extent that price levels differing as 1:3 may have had a similar level of frequency, while smaller (but more than negligible) numbers were even farther above or below the average. The price variation within a size group is thus many times wider than any variation between groups.

The averages thus result from a great many factors, some systematic and significant, others erratic and incidental, including a sizable amount of human error — mistakes in pricing by seller or buyer, or by both. The width of the variation must be remembered as a warning against drawing more conclusions from the data than they can support.

The influence which variation in cropland percentage may have on average per-acre price cannot be studied in detail, but some rough indications may be given. In the state as a whole, the 1954 census shows that 78 percent of the land in farms was cropland and 22 percent other

land. These percentages were somewhat different in the various type-of-farming areas, but the magnitude was similiar. Without pressing the argument, it is logical that a parcel consisting entirely of cropland could bring a higher price, maybe as much as one-fourth more, than a parcel of the same size but with average noncropland percentage. A parcel with twice the normal noncropland percentage could be sold for as little as three-fourths of the price for an average parcel of the same size, all else being equal.

The amount of variation in sales prices that could arise from varying proportions of cropland could be considerably greater than the variation that exists by size of tract, except on small tracts where buildings or site factors explain values far in excess of the average.

Financial limitations are related to the problem of price differentiation by size of tract. Would lack of funds depress the bids made for large farms? Appendix Tables 5 and 6 give some insight on this problem. From the combination of size and price level, the magnitude of total consideration can be surmised.

The two areas shown represent extremes. Area 4a is a large one with a high (unweighted) average price ($346) and a wide spread of prices. Area 7b is one of the smallest areas with an average price of only $94. The price spread was almost as wide, in relative terms, as in area 4a.

Area 4a gives no clear indication of any limitation because of total price. Purchases above or around $100,000 were more than negligible in number and occurred both among low-priced and high-priced land. It is striking how many different price levels were about equally represented within the same size bracket. What tendency there is for smaller tracts to be more frequent in the upper price brackets is no more than could be inferred from the average prices by size. Tracts between 50 and 180 acres in size, which included by far most of both the sales and the acreage, had their highest frequency in the price bracket $400-500 and much lower frequency in the open-ended last price class, $500 and over.

Area 7b, which is smaller and more homogeneous, does seem to indicate some, if weak, tendency for total price to stop short at a certain level. Even here, however, the bulk of the sales was in groups where two or more subsequent price brackets (within a given size in acres) had approximately the same frequency. If there was any influence from total price, it must have been a minor one.

The level of total price is, however, very different in the two areas. In area 7b there were no sales around $100,000 and very few near $50,000. Almost all the sales were below $30,000.

Such a difference in total price depends, of course, first and foremost on the size of existing farms. Those offered for sale can be no larger than the largest in existence and will usually be smaller; and total price cannot exceed available acreage times reasonable price per acre. This in turn places a limit on the amounts farmers can pay for land if their financing in a large measure hinges upon the amount of collateral they can offer in holdings they already own. For nonresident investors, size of farms on the market and price level are the main determinants of the total price they can pay. But there would still be a limit on the worth of a given land parcel.

Farmland value areas in Illinois

Using the sales data, it was possible to draw a more detailed map of price zones than could be done on the basis of county averages. Figure 10 (pages 24-25) shows these price zones based on moving averages. (See Appendix A for an explanation of method.)

The main features of price levels and their distribution across the state stand out rather clearly. In the transition from the high-priced areas of the "black prairie" to the low-priced lands of the "gray prairie," the price lines run close and almost parallel through Edgar, Coles, Shelby, Christian, and Montgomery counties. Farther west, the pattern is disturbed by the concentric rings of higher prices around the St. Louis area. To the northwest of the latter, the pattern is resumed around the low-priced zone along the lower part of the Illinois river.

The lowest prices are, on the whole, in southern Illinois. Prices below $75 (for the most part between $50 and $75) occur only in two areas, the larger of which includes all of Hardin, Pope, and Johnson counties and some parts of Massac and Union; the smaller one includes most of Hamilton County and smaller parts of Wayne and Jefferson counties. Both of these are surrounded by wide zones of prices between $75 and $100 which are, however, separated by a band of somewhat higher priced land ($100-$149). The $100-$149 bracket occurs over more areas than any other in southern Illinois and is also found in the low-priced areas along the lower Illinois river and in the northwestern tip of the state (in Jo Daviess County and part of Carroll). Price zones above $150 occur in southern Illinois apart from the St. Louis area mainly along the boundary rivers. Only in Wabash County is this influence strong enough to become visible on the map (Appendix A).

The high-priced areas (apart from those around large cities) have their highest extensively occurring levels between $400 and $500, with limited peaks above $500 in the center of Champaign County and in parts of Macon and Moultrie counties. The $400-$500 bracket occurs

Table 8. — Net Earnings to Land and Management From Farm Records in Three Counties in Relation to Land Price and Census Value

	Champaign	Henry	Effingham
Average sales price, 1952/53–1956/57	$469.5	$300.5	$121.2
Value, 1954 census	437.4	273.9	129.0
Value, 1959 census	544.7	345.5	190.6
Net return to land, average 1951–1955	23.35	20.39	15.08
Net return to land, average 1956–1960	20.75	22.07	12.78
Net return to land, average 1951–1960	22.05	21.23	13.93
Return to land as percent of			
Price, 1952/53–1956/57	4.7	7.1	11.5
Value, 1954 census	5.0	7.8	10.8
Value, 1959 census	4.0	6.1	7.3

in two extended areas, one in parts of La Salle, Livingston, Woodford, and McLean counties, and the other including most of Champaign, Piatt, DeWitt, Macon, Moultrie, and Douglas counties and about half of Logan County. Smaller pockets of the same bracket occur in Sangamon, Stark, Henry, and Bureau counties. A trough of lower prices (to below $200) in the high-priced area occurs in Putnam County and adjacent parts of Marshall and Bureau counties.

The main features of this price distribution are not very different from those known from census data by township up to 1945.[1] The graphic presentation in Figure 10 is not fully comparable with that based on the complete enumeration survey in the census, but is more generalized (Appendix A).

Variations in land earnings

The most direct reason for differences in land value ought to be in the level of net income received from owning the land. On the basis of farm records, it was possible to compute this net income.[2] Table 8 shows such data drawn from the Farm Bureau Farm Management Service records at the University of Illinois for three counties representing the three most important typical situations in the state. Champaign County is typical of the high land-value area of the "black prairie" with dominant cash-grain farming, many farms without livestock, and low building values in relation to land value. Henry County is repre-

[1] Data from the 1930 census on the township level published in C. L. Stewart, *Farm Real-Estate Valuations in Illinois,* Ill. Agr. Exp. Sta. Bul. 399, 1934, Fig. 9, p. 587, table, pp. 589-614.

[2] Net earnings are often difficult to establish with certainty, because (among other things) any such computation hinges upon certain assumptions, such as the level of remuneration to the operator's own labor, which should be used in the account. In Table 8, operators' labor was included among the costs at the going rate for hired farm workers. Return to management is thus included with the residual income attributed to land.

sentative of the medium land-value areas in western Illinois, with livestock farming prevalent. Effingham County, characterized by mixed farming, is rather typical of the low land-value region in southern Illinois.

The returns shown are rather high because the record-keeping farms include more of the better and less of the low-productive farms in each county. This feature is probably most salient in Effingham County where the sample is smallest. The difference in level of returns, therefore, is also not accurately reflected for the counties as a whole. Despite this, some main features can be seen from the figures.

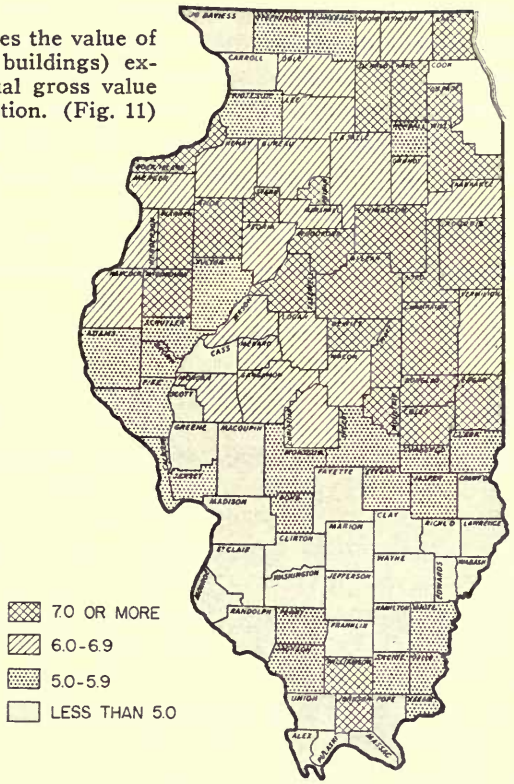
Year-to-year variation in all the counties is large. Such variation occurs in Henry County mainly because of fluctuations in the prices of animal products, in Champaign County because of variation in crop yields, and in Effingham County for both of these reasons. Use of three-year and five-year averages failed to show any significant trend up or down in net earnings over the decade 1951-1960. The ten-year average is, therefore, accepted as indicative of the earning power of an acre during the years shown.

The price rise during the 'fifties thus appears justified mainly because net returns were previously rather above the customary interest rate. Only in the cash-grain area is there clear evidence that the price increase went farther than would follow from a capitalization of net earnings. In Effingham County the backlog of uncapitalized earning power appears to have been particularly salient which may explain the sharper rise in price in much of southern Illinois during 1954-1959. Details of this price movement are shown in Figure 3 (right).

Another approach to the relation between land value and productivity is through analysis of gross output. Land values per acre according to the 1959 Census of Agriculture are shown in Figure 11 as multiples of the value of gross crop output per acre (average of the crop years 1958, 1959, and 1960). The land values have been reduced by the ratio of building assessment to total assessment to obtain an estimate of the value of land only. The price-to-return multiples on the map give a crude indication of what magnitude the price ought to be when the value of crop output is known.

There is a characteristic variation in these price-to-return multiples: they are higher the higher the price (and returns) per acre. In the extremes, for example, the multiple is twice as high in Champaign County as it is in several counties in southern Illinois. Land prices in Champaign County are five times as great as in those counties in southern Illinois, and gross crop output is two and one-half times as great. That price increases more than value of output is logical because the

Number of times the value of land (without buildings) exceeds the annual gross value of crop production. (Fig. 11)



fixed costs tend to be the same per acre rather independently of yield. The correlation between gross crop value and land price, on the other hand, is not very close. Where both gross crop value and land price are on a certain general level within an area, practically no correlation exists between the detailed variation of the two. When the price-to-output multiple is known for an area, the price for a given property can be checked for its reasonability. The multiple cannot, however, be used to establish market value with any degree of accuracy.

The most important factor that determines farmland value is, of course, soil productivity. When comparing the land price map with maps of soil productivity,[1] the connection between the main features of each is apparent. The sharp transition from the "black prairie" to the "gray prairie" is very clear on both maps, as are a number of other features.

To determine the more precise influence of soil productivity and of

[1] See Wascher, H. L., et al., *Illinois Soil Type Descriptions,* Ill. Agr. Exp. Sta. AG-1433, 1950.

other factors on land value, multiple regression must be used for analysis. Although excluded from this report for simplification, results of such analyses are available elsewhere.[1] They confirm that variation in soil quality has more influence on farmland value than any other variable affecting farmland value under normal circumstances when the land is intended for farming. The importance of other factors (notably building values and percentage of land other than cropland), however, is different by areas and by types of farming, thus modifying the relative importance of soil quality as a determinant of value.

Summary

1. The general level and trend of land prices were remarkably close to those reported previously. The data published by the U.S. Department of Agriculture were in good agreement with the sales prices. The same was true of the index numbers of average values per acre based on estimates made by the state's crop reporters. These trends are now shown in greater detail, such as by type-of-farming areas. They can also be better explained than before.

2. Tracts transferred in bona fide sales were generally smaller than average farms. On the average, they were only half as large as the farms in 1954. Most of the tracts transferred were bought to enlarge farms, not to be farmed as independent units. This included parts of farms which had been subdivided when they were sold. Purchase of an entire farm, to continue as an independent unit, was less common in recent years than purchase of a parcel to enlarge a farm.

3. Land with buildings sold for higher prices than land without buildings. The difference was 15 percent on the average. This difference was smaller than expected according to the value of buildings. The average value of buildings determined by tax assessors was 22 percent of the total value of the farm. The smaller difference for land sold on the market depends on whether land is bought to enlarge a farm. In such situations, many buyers are not interested in buildings. For parcels of 40 or 80 acres, nearly the same prices were paid whether or not the land had buildings.

4. Smaller tracts were sold for higher prices per acre than larger ones. In part this was because large tracts often contained more pasture and rough land and less cropland than smaller ones. It also seems that the better land more often became divided into smaller plots. There is no evidence to show that farmland becomes higher priced because it is divided into smaller plots.

[1] Anthony M. Grano, Regional Factors Affecting Land Values in Illinois, unpublished Ph.D. thesis, University of Illinois, 1963.

5. Areas in Illinois where different price levels of farmland prevailed in the mid-1950s were illustrated on a map. On the whole, the differences between areas were similar to those that existed decades earlier (for instance, around 1930). There were some changes, however. In the 1950s, land values rose fastest in southern Illinois, where the values were lowest, and slowest in east-central Illinois, where they were highest. Differences between areas have thus become somewhat smaller.

6. Differences between areas depend mainly on differences in soils and their productivity. The areas with different value levels were, on the whole, also areas with soils of different productivity. This is expressed in crop yields and in net earnings from land.

The price of land (without buildings) was as much as eight times the gross value of a year's crop production in the most fertile parts of the state. It was as little as four times the value of crop output in some of the least fertile counties in southern Illinois.

Comparison was made between land value and net earnings from land in three counties for different levels of land value. This comparison explains why land prices went up most on the lowest priced land and least where the price was highest to begin with. The highest priced land already had a price level in reasonable proportion to earnings. Further increases in land price led to low returns on investment. The lower priced land, by contrast, had rather high earnings in relation to the previous levels of land price. There was thus more room for increases in land price on the lower priced lands, despite the rather constant level of net earnings to land and management during the 1950s.

The rise in land prices is thus partly explained by the fact that land prices were too low previously. The rise also depended on other factors, the most important of which was the trend toward larger farms. Such a trend leads to tougher competition between buyers for land offered for sale.

APPENDIX A

The Data and How They Were Treated

The data on bona fide sales of farmland in Illinois used in this study were compiled by the Property Tax Division, Department of Revenue, State of Illinois, from county deed records for April 1, 1952 to March 31, 1957. The midpoint of this period of five sales years is close to the date of the 1954 Census of Agriculture, which was taken in November 1954. The total number of sales in the material was close to 16,000, covering around 1¼ million acres of farmland, with an aggregate sales price of about $265 million. The volume of sales was

similar from year to year, being rather close to ¼ million acres in each of the five sales years.

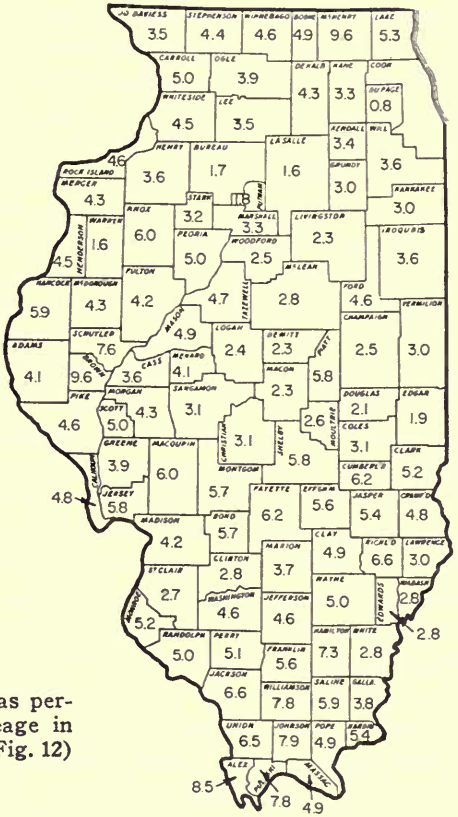
This turnover in five years represented close to 4 percent of the total farmland area and value in Illinois. The percentage was somewhat higher in area than in value; the straight average of value per acre was somewhat lower than the weighted average. The total number of transfers was slightly less than one-tenth of the number of farms in Illinois in 1954. It was also less than would be expected from the annual frequency of voluntary sales in those years. This depended on the exclusion from the material of transfers for which the transcripts were incomplete or misleading.

The rates for the five-year period in each county are shown in Figure 12. The rate of transfer was rather consistently below average in the high-value area of east-central Illinois. By contrast, most counties in southern Illinois were considerably above average in rates of transfer, with the exception of most counties along the Wabash river. In general, the low-value areas in western Illinois also had higher rates of transfer. The medium-value areas in the western and northern parts of the state showed a more mixed picture, as did the Chicago area. The extremely low rate of bona fide transfers for farming in Du Page County made it necessary to exclude this county from some of the analyses.

The unit of observation was the tract bought, not the tract offered for sale. The difference between these concepts stems from the possibility that a tract offered for sale may be subdivided at the time of sale and the partial tracts bought by different buyers, as is not uncommon at auctions. This appears more likely to happen to very fertile farms with high total values, for it may be more difficult to find a sole buyer who is able to pay the full value. A less fertile farm with a lower total price is easier to buy as a unit. Dividing it might even lower the value of its pasture and rough land which may be useful only in combination with a large unit. Furthermore, as will be seen below, these sales were to a great extent purchases for farm enlargement. The sales data are, therefore, a universe of essentially different structure than the universe of farms existing at the same time.

The first three of the five sales years represented a period of rather stable land prices in the early 1950s, while the last two marked the beginning of a renewed uptrend (Fig. 1). This must be kept in mind when interpreting averages for all five years, as well as data for individual sales years.

Data were grouped by type-of-farming areas, as shown in Figure 6. Each of these areas is far more homogeneous in soil conditions and



Acres sold, 1952/53-1956/57, as percent of the total farm acreage in each county. (Fig. 12)

other factors affecting land value than the state as a whole. Unlike most counties, they are large enough for most of their figures to reflect somewhat consistent trends rather than incidental circumstances. Data by type-of-farming areas are shown in Appendix B.

In the original records, the price often was not directly stated. When the transcript was made, the price was then inferred from the amount of federal revenue stamps, the latter being in constant proportion ($.55 to $500) to the price.[1] Because of the way the tax was assessed, the inferred price may have differed from the real one by a moderate amount (less than $500 of the total price). This variation was the same (in dollars) for all magnitudes of price and, therefore, relatively largest on low-valued tracts and negligible on tracts of higher

[1] In cases where the purchaser takes over an existing mortgage, the tax stamps indicate only the cash consideration (price minus mortgage). In transcribing such cases, the amount of the mortgage taken over was added to the price inferred from tax stamps.

total value. In most situations this source of error will be negligible, but it must be kept in mind when reading small numbers.

The study aims at exploring farmland prices. To avoid including sales of nonfarm properties, all urban townships were excluded, as well as all of Cook County. Sales with extremely abnormal prices were also excluded by the following screening procedure.

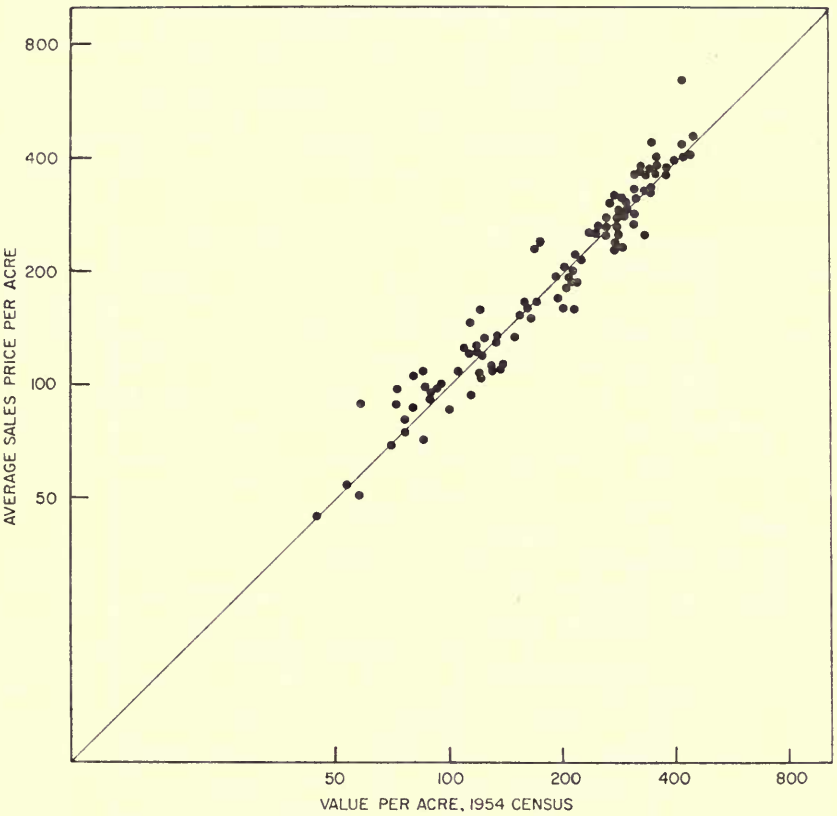
For each of the nine crop-reporting districts, an upper and a lower price limit were established. The lower limit was $10 per acre in all districts. The upper limit was defined as approximately three times the average value of a district. The number of sales exceeding these limits totaled upwards of 1,000. To minimize this restriction on the material, the punch cards were screened individually and those exceeding the limit by only a small amount were restored to the active deck, unless some circumstance (size of building assessment, for instance) indicated that they were likely to be nonfarm property. There were 15,803 cards in the active deck after 287 had been removed because of price limits and 583 excluded because of defective information.[1]

For this study, sales were coded by county and township and as improved or unimproved. The criterion of improvement class was the presence or absence of buildings on the property. Sales were also classified by size in acres, using all 16 classes that were used in some of the older censuses (for example, 1940). Each sale was dated as to year, quarter-year, and month when the sale took place. On the basis of this, they were further classified as to sales year — 12-month period starting April 1 and ending March 31. Sales year 1953, for example, means the period April 1, 1952 to March 31, 1953.

On the whole, the sales and census data were in fairly close agreement (Fig. 13). On the county level, however, the sales data and census data sometimes differed considerably. The often small number of sales in a county in one year contributed to this variation, but still more important was the location of the sales within the county. In counties where sales were clustered mainly in certain townships, the average sales price may have been distorted if townships in the same county had marked differences in their preponderant soil qualities or in other value-determining factors such as closeness to expanding urban centers.

To correct for this, the five-year data within each county were weighted by the farm acreage in each township. Data for only one year would in many cases be too few to make such a weighting effective. In this weighting, townships were excluded in which the acreage

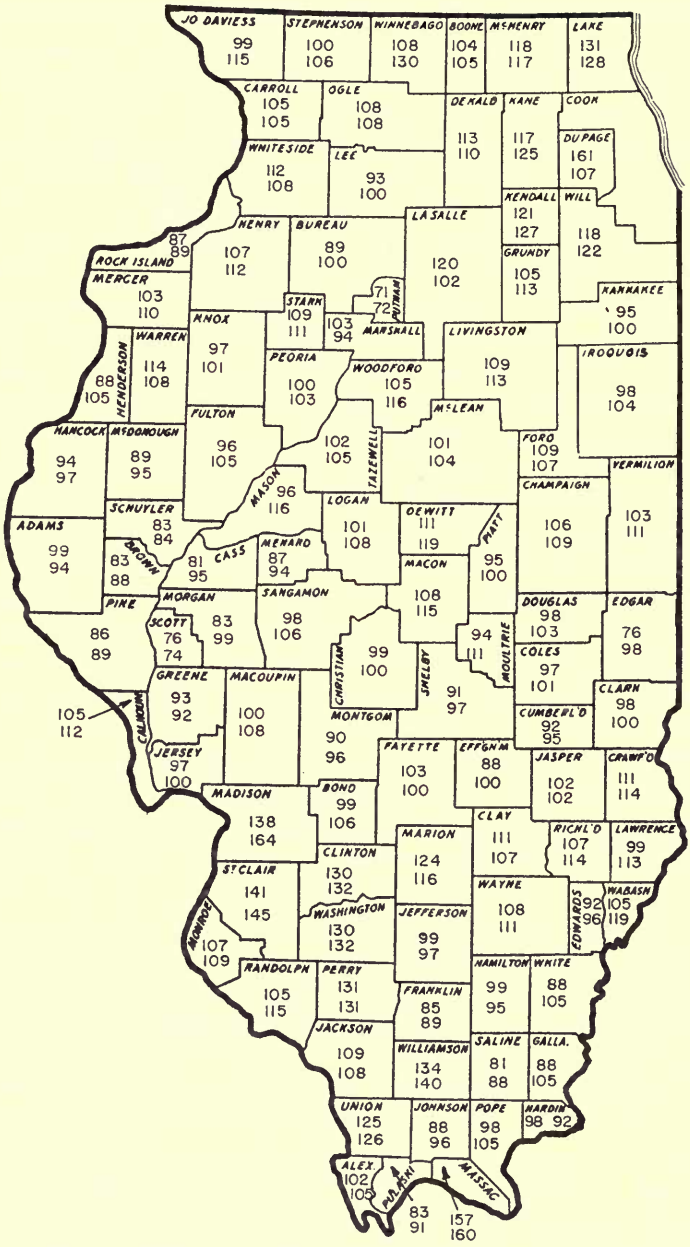
[1] This does not include sales with *very* defective information in the transcripts. Punch cards for such sales were not prepared.



Relationship between unweighted average sales prices, 1953-1957, and 1954 census values (county averages), Illinois. (Fig. 13)

sold was less than 100 acres or in which there was only one sale or no sale at all. The weighting thus sometimes refers to something less than the whole county, and the same average is imputed to the aggregate of the excluded townships. The exclusions generally add up to a minor part of a county, however.

Both weighted and unweighted data are shown in Figure 14 as percent of the county average values in the 1954 census. Weighted county averages were generally higher than the unweighted ones. This was the case in 78 counties, while 17 showed lower weighted than unweighted averages. Four counties had the same ratio to the census in both weighted and unweighted data. The reason may be that prices tend to be higher when only a few properties are sold in a given neighborhood, tending to give unduly high weight to some of the highest priced sales.



County averages as percent of 1954 census data, 1953-1957 sales data. Upper figures refer to unweighted averages, lower figures to averages weighted by township farm acreages. (Fig. 14)

In 42 counties the weighted figure was closer to the census than the unweighted one, in 54 counties the opposite was true, and in five counties there was the same degree of deviation from the census. The difference between weighted and unweighted data was moderate in most cases. Between weighted and unweighted data, there was no significant difference in the frequency of high or low deviation from the census.

In tracing zones of somewhat homogeneous price (zones within "iso-price" lines), as in Figure 10, pages 24-25, a difficulty arose from the patchy and somewhat haphazard upward and downward variation of township averages. The existence of genuine local variation was compounded by the fact that many township averages are based on rather small numbers of sales. In this situation, it is often possible to draw the same iso-price line in more than one place, and tracing limits between price zones becomes dependent on a measure of subjective judgment.

To correct for this situation, a device was used which may be called "moving average in space." In areas of regular 36-square-mile townships, the township averages from nine townships (forming a square of 18 x 18 miles) were added together; the total was divided by nine and plotted on the central township in the square. Thereafter, one row of three townships was dropped from one side of the square and three others added to the opposite side, and a new average was computed and plotted on the central township in the new 18 x 18 mile square. This procedure was done upwards and downwards, to the left and the right. Each township average was thus used as a component in nine different averages. Where townships of irregular size or shape occurred, estimates were made of their relative weight in a complete 18 x 18 mile square. A band of townships along the state boundary could not be ascribed any average, since this would have required information on townships from adjoining states.

The picture of price variation within the state which emerged from this treatment of the data was, on the whole, rather similar to that brought out by the raw data, but it was smoother and allowed the iso-price lines to be drawn with very little subjective judgment.

APPENDIX B

Data by State Type-of-Farming Areas

Appendix Table 1. — Average Price per Acre — Sales Data Weighted by County and Township Acreages, 1952/53–1956/57

Area	Sales data weighted by county farm acreages							Sales data weighted by township farm acreages, all five years
	1952/53	1953/54	1954/55	1955/56	1956/57	All five years	Average[a]	
	dollars per acre							
1[b]	549	405	338	375[c]	408	390	415[c]	369
1[d]	333	347	320	363	402	346	353	361
2	229	236	248	252	261	241	245	251
3	245	227	251	253	275	249	250	258
4a	306	345	330	369	395	351	349	362
4b	297	292	334	325	381	315	326	340
5a	177	198	191	198	222	198	197	210
5b	102	115	127	131	148	122	125	121
5a+b	156	169	168	174	196	171	173	178
6	142	139	171	149	171	153	154	163
7a	114	122	123	139	137	125	127	128
7b	86	89	103	97	105	95	96	93
7c	71	83	88	102	94	85	88	85
7a+b+c	90	98	104	112	112	101	103	102
8	110	108	144	117	134	119	122	132
9	64	73	79	84	76	75	75	77
All areas	223	228	235	243	265	237	239	245

[a] Average of five yearly values.
[b] Excluding Cook County.
[c] Estimate based on interpolated value for Du Page County for which there were no sales in 1955/56.
[d] Excluding Cook and Du Page counties.

Appendix Table 2. — Number of Sales by Size of Tract Sold, 1952/53–1956/57

Size class in acres	Type-of-farming area													Total all areas
	1	2	3	4a	4b	5a	5b	6	7a	7b	7c	8	9	
	number of sales													
Under 3	17	9	11	23	24	15	3	19	9	7	16	9	12	174
3–9	118	52	52	131	96	60	25	132	42	38	74	41	63	924
10–29	117	90	134	292	171	193	56	188	180	147	187	126	154	2,035
30–49	121	152	277	462	172	393	112	406	298	283	330	199	228	3,433
50–69	31	78	117	159	65	157	51	143	105	92	113	59	74	1,244
70–99	154	286	553	684	213	368	221	367	159	150	182	98	169	3,604
100–139	92	217	194	242	91	219	108	237	79	78	80	46	107	1,790
140–179	73	220	288	303	87	120	126	128	34	39	31	25	71	1,545
180–219	33	65	74	55	33	59	32	45	15	9	17	15	25	477
220–259	15	46	37	43	26	36	16	18	7	7	7	3	20	281
260–379	13	30	34	24	25	25	21	15	3	6	10	5	12	223
380–499	0	7	9	3	3	3	6	2	0	3	0	1	3	40
500 and over	0	0	3	5	4	8	6	0	0	1	1	0	5	33
Total, all sizes	784	1,252	1,783	2,426	1,010	1,656	783	1,700	931	860	1,048	627	943	15,803

Appendix Table 3. — Acres Sold by Size of Tract, 1952/53–1956/57

Size class in acres	Type-of-farming area													Total, all areas
	1	2	3	4a	4b	5a	5b	6	7a	7b	7c	8	9	
	acres sold													
Under 3	51	27	30	69	70	41	8	53	26	19	42	22	30	488
3–9	704	305	304	743	564	380	128	762	240	209	434	233	376	5,382
10–29	2,016	1,590	2,353	5,133	2,873	3,543	1,018	3,619	3,334	2,729	3,371	2,402	2,843	36,824
30–49	4,667	5,951	10,783	18,024	6,669	15,387	4,405	15,944	11,688	11,177	12,850	7,743	8,899	134,187
50–69	1,836	4,647	6,807	9,242	3,712	9,175	2,973	8,405	6,102	5,367	6,610	3,354	4,328	72,558
70–99	12,414	23,084	44,516	55,159	17,116	29,777	17,996	29,866	12,908	11,991	14,719	7,843	13,629	291,018
100–139	10,850	25,511	22,542	28,022	10,640	25,345	12,626	27,497	9,093	8,868	9,141	5,268	12,470	207,873
140–179	11,559	34,769	45,680	48,042	13,709	18,669	19,883	20,117	5,341	6,086	4,829	3,880	11,058	243,622
180–219	6,502	12,918	14,686	10,837	6,405	11,604	6,364	8,874	2,981	1,773	3,282	2,879	4,948	94,053
220–259	3,567	10,979	8,828	10,338	6,189	8,501	3,723	4,209	1,619	1,661	1,695	699	4,840	66,848
260–379	3,964	8,972	10,524	7,394	7,521	7,648	6,487	4,685	864	1,908	2,915	1,513	3,730	68,125
380–499	0	2,849	3,595	1,312	1,295	1,301	2,400	887	0	1,265	0	489	1,257	16,650
500 and over	0	0	1,831	3,234	2,247	4,571	5,062	0	0	860	500	0	4,987	23,292
Total, all sizes	58,130	131,602	172,479	197,549	79,010	135,942	83,073	124,918	54,196	53,913	60,388	36,325	73,395	1,260,920

Appendix Table 4. — Average Price per Acre by Size of Tract (Unweighted Averages), 1952/53-1956/57

Size class in acres	Type-of-farming area															Total, all areas
	1	2	3	4a	4b	5a	5b	5 (a+b)	6	7a	7b	7c	7 (a+b+c)	8	9	
	dollars per acre															
Under 3	6,436.2	3,675.9	2,950.0	3,061.5	2,708.9	2,478.0	...[a]	2,363.2	3,033.9	1,254.2	1,828.9	1,500.0	1,498.3	1,102.2	998.3	2,823.8
3–9	2,227.0	1,829.9	1,185.9	1,686.0	1,641.7	1,001.0	1,510.1	1,129.3	1,327.0	785.4	1,029.2	717.7	809.9	647.6	595.6	1,363.8
10–29	483.0	300.8	350.2	399.4	407.3	250.0	322.8	266.3	214.1	183.7	180.6	165.4	176.3	184.8	142.7	271.5
30–49	383.3	280.1	262.2	370.3	307.5	192.6	138.3	180.5	138.7	130.9	99.6	87.6	105.6	135.7	86.3	197.5
50–69	422.9	260.1	226.9	348.0	355.2	184.2	124.2	169.6	138.2	115.5	88.5	82.4	94.4	120.3	75.1	189.5
70–99	340.4	249.3	263.5	364.0	323.5	199.0	125.7	171.4	137.2	118.2	84.7	70.6	90.4	113.3	67.4	223.4
100–139	311.1	229.5	230.0	345.0	287.3	184.8	110.6	160.2	137.5	113.0	85.3	66.2	88.2	86.5	57.8	194.7
140–179	300.0	247.6	243.9	332.5	262.5	183.1	109.7	145.3	125.9	111.4	76.3	79.7	88.9	88.0	77.5	219.9
180–219	291.8	195.4	226.9	295.6	289.1	184.0	88.4	150.2	116.8	106.0	75.1	67.2	83.4	113.4	59.9	189.6
220–259	265.3	243.6	218.0	299.4	266.7	185.3	107.3	161.5	106.8	134.9	74.3	62.3	90.0	...[a]	55.8	201.7
260–379	245.5	232.8	169.9	261.9	204.7	156.6	132.6	145.6	118.2	...[a]	57.7	54.8	56.0	67.9	59.1	170.0
380–499	...	168.7	178.0	...[a]	...[a]	...[a]	69.2	93.3	...[a]	...	...[a]	...	...[a]	...[a]	...[a]	145.3
500 and over	...	...	...[a]	188.3	...[a]	103.5	86.9	78.1	...	...	...[a]	...[a]	...[a]	...	78.6	115.8
All sizes	349.6	243.1	241.2	346.4	297.7	188.4	117.8	161.6	143.6	125.5	94.0	85.0	101.0	118.0	74.8	211.0

[a] Less than five sales.

Appendix Table 5. — Number of Sales by Size of Tract Sold and by Price per Acre, Area 4a, 1952/53–1956/57

Size class in acres	Price per acre												Total, all prices
	$1–24	$25–49	$50–74	$75–99	$100–149	$150–199	$200–249	$250–299	$300–349	$350–399	$400–499	$500 and over	
	number of sales												
Under 3	0	0	0	0	0	0	0	0	0	0	0	23	23
3–9	1	0	0	0	0	0	0	2	2	6	11	109	131
10–29	0	0	1	7	15	25	20	33	25	36	47	83	292
30–49	0	0	3	9	30	37	45	66	44	47	82	99	462
50–69	0	1	3	4	11	18	14	23	10	17	30	28	159
70–99	0	3	3	5	27	44	51	91	104	86	176	94	684
100–139	0	0	1	3	13	21	29	27	39	24	56	29	242
140–179	0	1	2	2	14	27	30	54	47	43	61	22	303
180–219	2	1	2	1	3	5	8	7	8	5	8	5	55
220–259	0	1	0	0	2	2	6	13	8	3	7	1	43
260–379	0	0	1	0	3	4	3	3	5	3	2	0	24
380–499	0	0	0	0	0	1	0	0	1	0	1	0	3
500 and over	0	0	0	0	2	1	0	1	1	0	0	0	5
Total, all sizes	3	7	16	31	120	185	206	320	294	270	481	493	2,426

Appendix Table 6. — Number of Sales by Size of Tract Sold and by Price per Acre, Area 7b, 1952/53–1956/57

Size class in acres	Price per acre												Total, all prices
	$1–24	$25–49	$50–74	$75–99	$100–149	$150–199	$200–249	$250–299	$300–349	$350–399	$400–499	$500 and over	
	number of sales												
Under 3	0	0	0	0	0	0	0	0	0	0	0	7	7
3–9	0	0	0	0	0	2	1	1	1	2	1	30	38
10–29	1	2	9	23	35	22	19	14	3	6	5	8	147
30–49	0	40	79	59	66	18	12	4	2	0	3	0	283
50–69	0	15	26	26	17	6	0	1	1	0	0	0	92
70–99	2	25	43	41	34	3	1	0	0	0	0	1	150
100–139	0	13	23	21	15	5	1	0	0	0	0	0	78
140–179	3	6	14	7	7	2	0	0	0	0	0	0	39
180–219	1	2	1	3	2	0	0	0	0	0	0	0	9
220–259	0	3	2	2	0	0	0	0	0	0	0	0	7
260–379	1	2	1	2	0	0	0	0	0	0	0	0	6
380–499	1	0	1	1	0	0	0	0	0	0	0	0	3
500 and over	0	0	1	0	0	0	0	0	0	0	0	0	1
Total, all sizes	9	108	200	185	176	58	34	20	7	8	9	46	860

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