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The Minnesota Rural Real Estate Market in 1985

Including Special Studies of:

Southwestern Minnesota
Deflated District Land Values
Population Growth Influences
Land Value Declines

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SUMMARY

The value of Minnesota farmland declined in 1985 for the fourth consecutive year. The average estimated value of land per acre declined 26 percent from the 1984 figure of \$927, to a 1985 level of \$686. The average (adjusted) sales price dropped 27 percent from 1984 to 1985. The severity of declines varied across the state, with the greatest declines occurring in the agriculturally rich southern portion of the state, which witnessed declines in the average estimated value of farmland per acre of 26 percent in the Southeast and the East Central districts and 31 percent in the Southwest district. The statewide estimated value per acre of farmland for 1985 was at the same nominal level as 1976. Correcting for inflation, the real average estimated value per acre of farmland for the state is approximately equal to the 1973 figure, indicating that the past four years of declines have wiped out the gains in land values made during the "land boom" years of the 1970s.

The unadjusted state average reported sales price per acre in 1985 was \$862, a 32 percent decline from the similar figure for 1982. The declines in the unadjusted sales price per acre for the reporting districts mimicked the pattern exhibited by the average estimated value of farmland: the greatest declines in average reported sales price were in the southern portion of the state. Average reported sales prices per acre dropped 29 percent in the Southwest district, 27 percent in the Southeast, and 21 percent in the East Central district.

Declines in the adjusted average reported sales price per acre were reported by all districts; only the volatile Northeast district reported a smaller decline in 1985 than in 1984. For the state as a whole, the adjusted average reported sales price dropped 27 percent from the 1984 level. Deflating this figure results in a real statewide decline of approximately 30 percent.

Activity in the Minnesota rural real estate market was sharply down in 1985. The number of reported sales dropped precipitously, from 1,230 in 1984 to 795 in 1985, for a percentage drop of 35 percent. Expansion buyers were still the most active in this shrinking land market, accounting for 74 percent of all reported sales. The share of sales going the expansion buyers, however, decreased from the 1984 level of participation, while sole-tract operators and agricultural investors both slightly increased their market share, with 13 percent of reported sales going to each.

Retirement returned as the most frequently given reason for sale, accounting for 25 percent of the sales reported in 1985. Size reduction was given as the reason in 18 percent of the sales. Sixteen percent of the sales reported listed financial difficulties as the major reason for sale, which, when added to the size reduction figure, suggests that financial conditions may have been a major inducement to sale in up to 34 percent of the sales reported.

The Minnesota rural real estate market maintained its localized character in 1985. The number of sales going to buyers whose place of residence was within 10 miles of the tract purchased accounted for 81 percent of the total sales going to buyers living more than 50 miles away from the tract purchased, but much of this increase is attributable to a sudden jump in sales to this group in the Northeast district. The median distance of buyer from tract purchased for Minnesota was 3 miles. An identical median figure was reported for all regions in the state except the Northeast, which reported a median distance of buyer from tract purchased of approximately 27 miles.

Contract for deed financing was again the most popular method of financing, accounting for 46 percent of the sales reported in 1985. This figure represents a slight decline in the percentage of sales captured by contract for deed. Mortgages financed 22 percent of sales reported in 1985, down from 24 percent in 1984. Cash was used to finance a larger percentage of total sales in 1985 than in 1984 for the state as a whole (32 percent), and in some districts rivalled or exceeded the popularity of contract for deed.

It is important to note that the data reported in this survey, collected in July and August of 1985, reflect only sales occurring between January 1 and July 1 of 1985. Land market activity since these dates will be reported in the 1986 Minnesota Rural Real Estate Market Survey.

PROCEDURE

Data for this report were collected from surveys mailed in July and August, 1985, to brokers, insurance agents, bank representatives, county officials, and others acquainted with the Minnesota rural real estate market. Of the 1,498 surveys sent out, 732 persons responded for a response rate of approximately 49 percent.

Respondents were asked to provide two types of information: their estimate of the average value of farmland in their area, and a report of actual sales in the areas they were familiar with. It is important to note that the estimated values are for total farm acres, including land and buildings, and not just for cropland alone. The sales prices reported in Part I are also based on total acres per sale, including land and buildings. While we do report the differences in sales price for land without buildings and land with buildings, these differences may not accurately reflect the difference attributable to the value of the buildings and may instead only reflect regional characteristics and the varying nature of agricultural occupations. For example, in a county in which most sales are made to expansion buyers, we might well see a higher average sales price for land without buildings than land with buildings. This does not mean, however, that the buildings located on farmland in this county have little or no value, but that farmland without buildings on average command a higher price than farmland with buildings.

The section of the survey regarding respondents' estimates asks individuals to provide data as to frequency of sales, personal involvement in the rural real estate market, participation of brokers in their area, and the respondents' estimates of the value per acre of farms of average size and quality in their community. Respondents are also asked to provide similar estimates for average size farms of high, medium and low quality. It must be noted that the judgments of quality are subjective and must be presumed to vary according to community.

Percentage changes in the estimated value of farmland were calculated as follows. From the set of respondents answering the questions on estimated value, a sub-sample were selected of individuals who had responded to the 1984 survey as well as the 1985 survey. This restrictive procedure resulted in 361 usable surveys. Using the responses of this sub-sample, we calculated the 1984 and 1985 average estimated land values per acre by (1) weighting the average land value estimate in each county by the acres of farmland in that county, (2) summing the weighted values for all counties in a given reporting district, and (3) dividing this sum by the total number of acres in the reporting district. A similar procedure was used to calculate the statewide figure. By comparing the 1985 average estimated land value given by the responses of our sub-sample to the 1984 average estimated land value those same respondents had given in the previous year, we arrived at the percentage change in the average estimated value of land for the 6 reporting districts and the state. By applying this percentage change to the average estimated land values as reported in

The Minnesota Rural Real Estate Market in 1984, by Carolyn Emerson and Philip Raup, we arrived at the 1985 average estimated value per acre of farmland in the six reporting districts and the state.

Results obtained using estimates tend to be more indicative of overall land values than results obtained from actual sales. Estimates ask individuals to value all farms in their community, which can be assumed not to vary greatly from year to year, while reported sales only signify actual market transactions, which may or may not be representative of the county or region as a whole. Nonetheless, reported sales data are necessary for investigating the nature of and trends in the Minnesota rural real estate market. In 1985, 795 usable sales were reported.¹

Respondents were asked to provide information on each sale, including the month of sale, the sales price per acre, the amount of acres sold, the location of the sale, the quality of the land and buildings (if any), the method of financing, the reason for sale, and the characteristics of the buyer. The Minnesota Rural Real Estate Market Survey distinguishes three types of buyers:

- 1) Sole-Tract Operators: Individuals who do not purchase the land to expand existing land holdings, and who plan to farm the land themselves.
- 2) Expansion buyers: Individuals who purchase the farmland in order to expand existing land holdings, and who plan to farm the land themselves.
- 3) Investors: Buyers who do not intend to farm the purchase themselves. Typically, they intend either to rent out the land or to operate the farm through a manager.

As with estimates, the quality of land is a personal judgment made by the respondent, and can be expected to vary among individuals and among different regions of the state.

The presentation of this material is made possible by the conscientious and speedy replies of the respondents, many of whom have been participating in this survey for several years. Their cooperation is gratefully acknowledged.

¹Between the publication date for the Minnesota Agricultural Economist, No. 650, and the writing of this Bulletin, a miscoded sale was detected. The results reported here are unaffected by this miscoded sale.

Part I: The Minnesota Rural Real Estate Market in 1985

A. Land Market Trends

REPORTERS' ESTIMATES

The average estimated value per acre for Minnesota farmland in 1985 was \$686, representing a decline of 26 percent and a dollar decline of \$241 from the 1984 figure of \$927 [Table 1]. This was the fourth year in a series of declines starting after the peak in 1981. Historically, the 1984-1985 decline represents the largest percentage one-year decline in the 75 years since 1910, the year in which the University of Minnesota started collecting data on Minnesota farmland values. [The previous record was a 25 percent decline over the two years from 1930-31 to 1932-33].

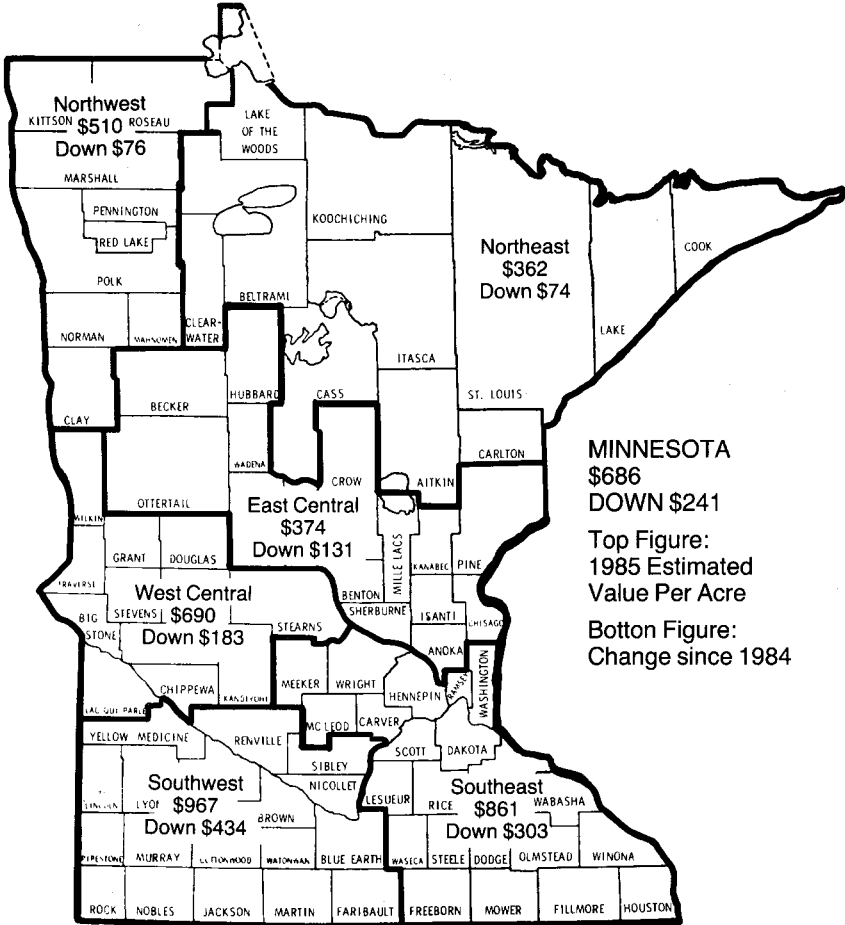
For purposes of study, the Minnesota Rural Real Estate Market Survey divides Minnesota into 6 reporting districts [Figure 1]. In all six districts of the state, declines from previous year values were greater for 1985 than for 1984. The greatest declines occurred in the Southwest, where estimated farmland values dropped 31 percent from 1984, to a 1985 level of \$967 per acre [Tables 2 and 3]. The smallest decline was felt in the Northwest district, which reported a drop of 13 percent, to \$510 per acre.

The highest valued farmland is still in the Southwest, followed by the Southeast district (\$861), the West Central (\$690), the Northwest (\$510), the East Central (\$374) and the Northeast (\$362). This ordering has been fairly stable since 1944-5, except for occasional reversals between the East Central and Northwest districts.

The greatest declines in average estimated value occurred in the districts with the highest valued land, in the agriculturally rich southern portion of the state. The declines in the East Central district deviate from this pattern, yet it is important to realize that the declines of this region were at least partially offset by the urban influence of the Twin Cities. The results for the Northeast district must be carefully interpreted due to the scarcity of tillable land in the district and the historically volatile nature of its land market.

Deflating the figures for the estimated value of farmland allows comparison of land values with the effects of inflation removed. In unadjusted dollars, the statewide 1985 nominal estimate of land value is approximately equal to the 1976 nominal figure [Table 1]. Deflating the average estimated values by the Gross National Product (GNP) Implicit Deflator for Personal Consumption Expenditures shows that in 1972 dollars the real average estimated per acre value of Minnesota farmland in 1985 (\$304) is approximately equal to the figure for 1973

**Figure 1: Estimated Land Values per Acre in 1985*
(Excluding Hennepin and Ramsey Counties)**



*Based on reported estimates of average value per acre of farmland for the first six months of 1985.

TABLE 1: Recent Changes in the Average Estimated Value of Minnesota Farmland (1972-1985)

Year	Average Estimated Value (dollars)	Dollar Difference from Previous Year	Percentage Change
1972	248	+ 16	7
1973	298	+ 50	20
1974	423	+ 125	42
1975	525	+ 102	24
1976	667	+ 142	27
1977	794	+ 127	19
1978	889	+ 95	12
1979	1040	+ 151	17
1980	1120	+ 80	8
1981	1310	+ 190	17
1982	1179	- 131	- 10
1983	1065	- 114	- 10
1984	927	- 138	- 13
1985	686	- 241	- 26

(\$287).² [See Table 6, next section] The survey indicates that, in terms of real purchasing power, the land value declines since 1981 have wiped out all of the gains made during the land boom years in the real value of Minnesota rural real estate. Part IV of this study further addresses this issue.

²Some economists contend that the Gross National Product (GNP) implicit price deflator for Personal Consumption Expenditures is a better indicator of price changes than the Consumer Price Index (CPI). The CPI measures prices for a specified collection of goods and services which are typically purchased by urban consumers. The GNP implicit price deflator indicates that price changes of all goods and services acquired through personal consumption expenditures.

Table 2: Estimated Average Value Per Acre of Farmland,
by District, Minnesota, 1972-85.

Years	South- east	South- west	West Central	East Central	North- west	North- east	Minnesota
1972	370	379	208	163	117	76	248
1973	433	459	247	194	146	115	298
1974	576	675	378	279	199	144	423
1975	674	844	503	296	295	163	525
1976	856	1106	624	349	378	210	667
1977	1027	1316	730	415	427	279	794
1978	1191	1421	803	498	483	304	889
1979	1453	1620	883	573	599	368	1040
1980	1526	1750	962	596	683	390	1120
1981	1709	2083	1135	679	813	460	1310
1982	1504	1875	1044	584	748	483	1179
1983	1354	1669	981	561	658	411	1065
1984	1164	1401	873	505	586	436	927
1985	861	967	690	374	510	362	686

ACTUAL SALES

Data were collected on 795 sales occurring between January 1, 1985 and July 1, 1985. This figure represents a decline of 35% from the 1,230 reported sales in 1984. Based upon these reported sales, the average price per acre for Minnesota farmland in the first six months of 1985 was \$862 [Table 4]. While there is a \$176 difference between this figure and the average estimated value per acre of farmland reported above, it must be noted that the average sales price is a reflection of current land market transactions only, while the respondents' estimates take into account all land in a given district.

Table 3: Annual Percentage Changes in Estimated Farmland Value per Acre by District, Minnesota, 1975-85.

District	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85
Percentage Change in Estimated Farmland Value										
Southeast	27	20	16	22	5	12	-12	-10	-14	-26
Southwest	31	19	8	14	8	19	-10	-11	-16	-31
West Central	24	17	10	10	9	18	-8	-6	-11	-21
East Central	18	19	20	15	4	14	-14	-4	-10	-26
Northwest	28	13	13	24	14	19	-8	-12	-11	-13
Northeast	29	33	9	21	6	18	5	-15	6	-17
Minnesota	27	19	12	17	8	17	-10	-10	-13	-26

The average reported sales price for 1985 reflects a 32 percent decline from the 1984 reported average of \$1266 [Table 4]. This 32 percent decline is accounted for by substantial drops in the average reported sales prices for all districts in the state, and by a small increase in the relative frequency of sales in the lower-priced districts of the north. All districts except the Northwest and Northeast reported both fewer acres sold and fewer sales in 1985 than in 1984. [See next section for further analysis of land market activity.]

Ignoring these shifts in relative market activity can distort calculated trends in district and state-level average sales data. To compensate for these market shifts, adjusted sales prices were calculated as follows. First, the average sales price for each county for 1985 was multiplied by the total acreage reported sold in that county in 1984. For each reporting district, these products were summed, and then divided by the total acreage reported sold for the district in 1984 to arrive at the adjusted sales price for that district. The state figure was similarly calculated. Comparing these adjusted sales prices to unadjusted sales prices in 1984 allows a comparison of trends in sales prices with the effect of market activity shifts removed.

Using these procedures, the adjusted sales price for Minnesota farmland fell 27 percent from 1984 to 1985 [Table 5]. This number is lower than the unadjusted decline of 32% reported for the state as a whole. This difference is accounted for by the shifts in market activity from 1984 to 1985. The greater relative frequency of lower priced northern sales in 1985 tended to drag down the average statewide reported sales price. Weighting sales prices in 1985 by acres sold in 1984 results in a more realistic picture of actual trends in realized sales prices.

Table 4: Average Reported Sales Price per Acre of Farmland,
by District, Minnesota, 1972-85
(Unadjusted)

Years	South- east	South- west	West Central	East Central	North- west	North- east	Minnesota
1972	389	366	222	145	107	76	293
1973	444	410	223	178	120	122	298
1974	598	630	340	243	204	144	450
1975	792	844	493	299	353	159	607
1976	937	1116	644	321	377	210	735
1977	1216	1340	709	446	432	198	859
1978	1352	1321	908	554	504	256	980
1979	1675	1680	949	618	612	411	1140
1980	1837	1868	1095	603	759	394	1318
1981	1965	2005	1171	680	919	483	1367
1982	1749	2022	1168	746	887	406	1360
1983	1470	1872	1068	679	711	328	1291
1984	1386	1665	1062	644	700	223	1266
1985	1013	1181	872	510	575	190	862
% Change 1984-5	-27	-29	-18	-21	-18	-15	-32

To account for inflation, the 1985 adjusted average sales price per acre and the 1984 unadjusted average sales price per acre of farmland in Minnesota were deflated using the Consumer Price Index (CPI) and the Gross National Product (GNP) Implicit Deflator for Personal Consumption Expenditures. The real percentage change in the adjusted sales price was then arrived at by calculating the percentage change from the 1984 deflated unadjusted average sales price per acre to the 1985 deflated adjusted average sales price per acre. Using either the CPI or the GNP Implicit Deflator, the real average adjusted sales price per acre for Minnesota farmland dropped 30 percent from 1984 to 1985.

Table 5: Annual Percentage Changes in Adjusted Sales Price per Acre, by District, Minnesota, 1975-85.

District	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
	-76	-77	-78	-79	-80	-81	-82	-83	-84	-85
	Percentage Change in Adjusted Sales Price									
Southeast	23	23	13	13	6	6	-8	-14	-7	-25
Southwest	33	20	2	22	12	15	-8	-11	-13	-35
West Central	32	8	18	4	9	13	-9	-9	-3	-20
East Central	6	32	37	16	0	19	4	-7	6	-12
Northwest	10	10	12	44	18	18	-14	-20	-4	-16
Northeast	21	8	-24	47	-27	-4	-18	-17	-44	-8
Minnesota	26	18	10	17	9	11	-8	-12	-8	-27

These declines in real sales prices are consistent with the declines in real estimated values. Using the CPI or the GNP implicit deflator results in an approximate decline of 29 and 28 percent, respectively, in the real average estimated value of farmland per acre in 1985. [Table 6] Since the 1981 peak in values and sales prices for rural Minnesota farmland, the real unadjusted average sales price has fallen 43 percent using the GNP deflator and 47 percent using the CPI; in contrast, the estimated average value of farmland has fallen 53 percent using the GNP deflator and 56 percent using the CPI deflator. Based upon the real per acre estimated value of Minnesota farmland, the declines from 1981 to 1985 have wiped out well over half of the purchasing power represented by an acre of farmland.

Further analysis of the declines on a regional basis is provided by looking at data for the 13 Economic Development Regions (EDR) [Figure 2]. The highest average reported sales price per acre for Minnesota farmland in 1985 was reported by Region 11, the Seven-County Metro Area [Table 7]. This represents the first year since 1974 that Region 11 reported the highest average sales price per acre, interrupting a 10-year period during which South-Central Region 9 consistently claimed the top average reported sales price. Part of this change is due to the dissimilar decreases in sales prices experienced by the two regions. While Region 11 reported a drop of 13 percent, this drop was the second smallest in the state [Table 8]. By comparison, Region 9 saw a 30 percent drop, the third largest decline in the state.

TABLE 6: Average Estimated Value and Average Reported Sales Price Per Acre in Real Values, Deflated by the GNP Implicit Price Deflator for Personal Consumption Expenditures, Minnesota, 1970-1985

Year	GNP Implicit Price Deflator for Personal Consumption Expenditures (PCE) (1972 = 1.0)	Minnesota Deflated Estimated Average Land Value Per Acre (PCE)	Minnesota Deflated Average Reported Sales Price Per Acre (PCE)
1973	1.038	287	287
1974	1.154	366	390
1975	1.322	397	459
1976	1.386	481	530
1977	1.463	543	587
1978	1.572	565	623
1979	1.708	609	667
1980	1.822	601	723
1981	2.022	648	676
1982	2.095	563	649
1983	2.136	499	604
1984	2.186	424	579
1985	2.255	304	382

The largest percentage change in sales price occurred in Region 3, the Northeastern corner of the state, with a decline of 44 percent, but this figure is based on an average sales price reflecting only 8 sales. The small number of sales, combined with the primarily non-agricultural character of Region 3 diminishes the significance of this decline. The smallest drop in average reported sales prices was in Region 5, located in Central Minnesota, which reported a nominal decline of only 7

Figure 2: Minnesota Economic Development Regions

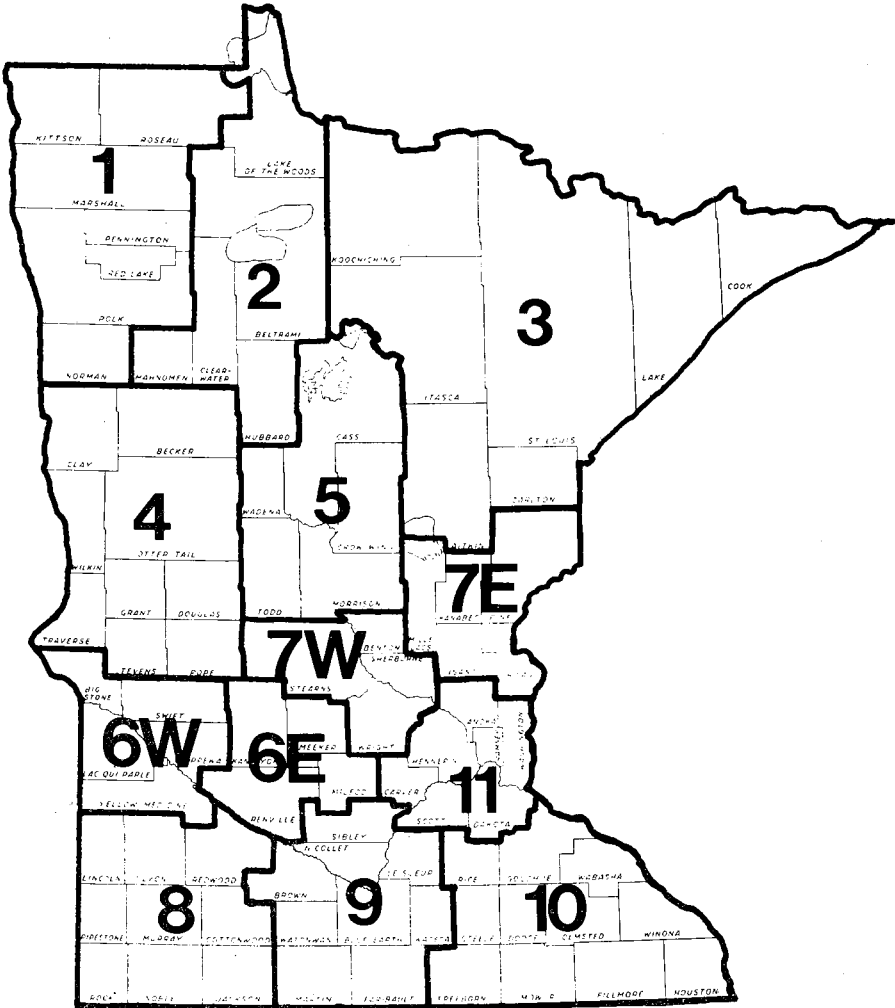


Table 7: Average Reported Sales Price per Acre of Farmland, by Economic Development Regions, Minnesota, 1974-85. (Unadjusted)

Economic Development Region	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985
	Dollars per Acre											
1	199	344	300	367	433	560	732	888	806	671	636	533
2	141	206	250	277	321	520	452	645	459	515	460	390
3	148	157	162	179	280	310	271	386	325	141	256	144
4	317	446	542	558	853	828	868	973	987	874	955	691
5	197	259	235	297	478	483	506	695	556	605	502	467
6W	341	537	696	746	906	960	1051	1303	1259	1090	1099	872
6E	569	691	923	1027	1171	1528	1735	1949	1876	1589	1391	1163
7W	430	472	596	778	927	1112	1056	1300	1240	1187	1124	869
7E	254	316	455	473	575	768	741	790	873	780	829	604
8	534	710	906	1058	1199	1574	1674	1646	1701	1743	1405	986
9	829	1115	1464	1835	1682	2111	2320	2865	2484	2139	1978	1392
10	565	753	915	1197	1373	1645	1864	1941	1713	1395	1337	929
11	882	1035	1150	1437	1396	1799	1778	1830	1711	1878	1642	1423
Minnesota	450	607	735	859	980	1140	1318	1367	1360	1291	1266	862

percent. Region 5 was also the only EDR to report a smaller percentage decline in 1985 than in 1984. Infrequent sales in both Regions 2 and 3 make interpretation of the figures for these two regions in Tables 7 and 8 difficult.

Given the shifts in the Minnesota rural real estate market in 1985, it is important to look at the adjusted average sales prices for the Economic Development Regions [Table 9]. Even accounting for shifts in market activity from 1984 to 1985, Region 11 still reported the highest adjusted average sales price. The lowest adjusted reported sale price was \$160 per acre in Region 3, but this is subject to the previous warning regarding the volatility of the land market in that area.

Compared to the 1984 figures, these adjusted sales prices result in a quite different pattern of percentage change in land prices than is shown by using the unadjusted figures. For example, Regions 1, 2, and 5 all reported gains in their adjusted average reported sales prices in 1985. The greatest decline in adjusted sales prices was reported by Region 6E (-45 percent). This unusually large drop is accounted for by large declines in Renville county, as well as increased relative market activity in Kandiyohi county, where the average sales price declined only 7 percent. Adjusting the reported sales prices for the Economic Development Regions had a mixed results overall; 7 of the regions reported lower adjusted declines than unadjusted declines, while 6 regions reported lower unadjusted declines than adjusted declines.

Table 8: Annual Percentage Change in Sales Price per Acre, by Economic Development Regions, Minnesota, 1974-1985. (Unadjusted)

Economic Development Region	% Change in Sales Price										
	1974 -75	1975 -76	1976 -77	1977 -78	1978 -79	1979 -80	1980 -81	1981 -82	1982 -83	1983 -84	1984 -85
1	73	-4	11	18	29	31	21	-9	-17	-5	-16
2	46	21	11	16	62	-13	43	-29	12	-11	-15
3	6	3	10	56	11	-13	42	-16	-56	44	-44
4	41	22	3	53	-3	5	12	1	-11	8	-28
5	31	-9	26	61	1	5	37	-20	9	-17	-7
6W	57	30	7	21	6	9	24	-3	-13	1	-21
6E	21	34	11	14	30	14	12	-4	-15	-12	-16
7W	10	26	31	19	20	-5	23	-5	-4	-5	-23
7E	24	44	4	22	34	-4	7	11	-11	6	-27
8	33	28	17	13	31	6	-2	3	2	-19	-30
9	35	31	25	-8	26	10	24	-13	-14	-8	-30
10	33	22	31	15	20	13	4	-12	-19	-4	-31
11	17	11	25	-3	29	-1	3	-7	10	-12	-13
Minnesota	35	21	17	14	16	16	4	-1	-5	-2	-32

TABLE 9: Average Adjusted Sales Price Per Acre and Percentage Change in Average Adjusted Sales Price Per Acre, Minnesota, 1984-85

Region	1984 Unadjusted Average Sales Price	1985 Adjusted Average Sales Price	Adjusted % Change 1984-85	Unadjusted % Change 1984-85 ^{1/}
1	636	1008	58	- 16
2	460	604	31	- 15
3	256	160	- 38	- 44
4	955	734	- 23	- 28
5	502	515	3	- 7
6W	1099	811	- 26	- 21
6E	1391	760	- 45	- 16
7W	1124	833	- 26	- 23
7E	829	773	- 7	- 27
8	1405	942	- 33	- 30
9	1978	1332	- 33	- 30
10	1337	983	- 26	- 31
11	1642	1410	- 14	- 13
MN	1266	919	- 27	- 32

^{1/} From Table 8.

LAND MARKET ACTIVITY IN 1985

The Minnesota Rural Real Estate Market Survey provides not only a guide to levels and trends in Minnesota farmland values and prices, but also information as to the level of market activity in the state. The sales volume in 1985 was sharply down, by 35 percent from 1984. Across the state only 795 sales were reported, in contrast to the 1,230 sales reported in 1984 [Table 10]. The greatest percentage drops in sales occurred in the Southwest, where the number of sales fell by 53 percent. Declines in the Southeast and West Central districts were also sharp, with drops in sales of 35 percent and 32 percent, respectively. Smaller declines occurred in the East Central district, while the Northwest and Northeast actually reported an increase in sales activity in 1985.

There is always a risk in a survey of this kind that changes in sales activity may be the result of diminished reporting. The possibility that this may have occurred in 1985 is reduced by the fact that the number of respondents in 1985 (732) showed little change from the number of respondents in 1984 (747).

The decline in sales activity is supported by the subjective opinions of the respondents. In each district, less than 10 percent of the respondents felt that the number of farms sold had increased from the first six months of 1984 to the first six months of 1985. In the Northwest and Northeast, over 90 percent of the respondents in each district reported that the number of sales was about the same, or had increased, which corroborates the mild increases in sales that were reported for those districts. In the Southwest, the Southeast, and the

Table 10. Number of Reported Sales, Acreage of Land Sold and Average Acres Per Sale, by District, Minnesota, January 1 - July 1, 1983-1985.

District	No. of Sales*			Acres Sold			Acres/Sale		
	1983	1984	1985	1983	1984	1985	1983	1984	1985
Southeast	336	365	237	40,878	45,520	29,601	122	125	125
Southwest	395	468	221	50,127	52,855	27,336	127	113	124
West Central	187	208	142	31,190	34,771	22,377	167	167	158
East Central	158	112	86	20,421	15,599	10,475	129	139	122
Northwest	105	69	91	24,211	15,023	16,652	231	218	183
Northeast	23	8	18	3,007	1,346	7,273	131	168	404
Minnesota	1204	1230	795	169,834	165,114	113,714	141	134	143

*These sales should not be interpreted as a record of total farm land transactions for the years indicated. The majority of farm land sales are completed in the first half of the calendar year, which explains the choice of the January 1 - July 1 reporting period. Some sales do occur in the latter half of the year, but they are not included in the data reported.

West Central districts, where declines in sales were greatest, over half of the respondents replied that sales volume had decreased. While the accuracy of these subjective responses depends greatly on the expertise of the respondents, they support the aggregate statistics showing that farmland sales in Minnesota dropped by a significant amount from 1984 to 1985.

Although the volume of sales fell, the participation of brokers increased. [Table 11]. Brokers in 1985 were reported to have participated in 58 percent of the sales, up from 53 percent in 1984. In four of the six regions, the direction of change in average acres per sale was the same as the direction of change in the percentage of sales using brokers. This is to be expected. With farms of larger size there is an increasing tendency to seek services of a broker in accomplishing sales. As farm size decreases, it is often easier to sell the farm on one's own, without the use of a broker. The increased statewide use of brokers is also consistent with reports of reduced market activity. In a market where sales are few and prices are low, those wishing to sell rural real estate turn more readily to brokers for help in finding willing buyers.

Table 11. Estimated Proportion of Farm Land Sales in which Brokers or Dealers Participate, Minnesota, by District, 1972-1985.

Year	Sales with Brokers' Services						Minnesota
	South-east	South-west	West Central	East Central	North-west	North-east	
1972	59	52	56	54	40	50	52
1973	58	51	54	58	40	46	51
1974	61	54	53	55	40	58	54
1975	58	47	52	60	34	54	51
1976	58	48	50	56	37	57	51
1977	57	48	50	59	42	57	52
1978	60	48	51	60	43	61	54
1979	55	44	52	59	40	55	51
1980	57	48	50	60	41	56	52
1981	60	51	56	63	44	58	55
1982	61	55	59	65	45	64	58
1983	64	58	63	60	43	67	59
1984	61	54	58	57	37	52	53
1985	61	57	60	54	48	64	58

B. Analysis of Reported Sales

REASON FOR SALE

The most frequently given reason for sale in 1985 was retirement, accounting for 25 percent of all reported sales. [Table 12]. Retirement has long been the most often cited reason for sale, with the exception of 1984. The most frequent reason for sale in 1984 was to reduce the size of operation, involving 25 percent of all sales, while in 1985 size reduction accounted for only 18 percent of the decisions to sell. Death was given as the reason for sale in 17 percent of the sales in 1985, while decisions to quit farming accounted for 12 percent of sales. Decisions to move but not to quit farming, and divorce, accounted for a small share of sales in 1985, 2 percent and 1 percent respectively, while the remaining 25 percent of sales were grouped in a miscellaneous category.

A look at the relative trends in sales due to a desire to reduce the size of the operation and miscellaneous sales (grouped as "other reasons") indicates a slight decline in the former and a rather brisk increase in the latter. Since these trends appear contradictory to the general perception of a deteriorating farm situation, they warrant further investigation. Sixty-three percent of the sales grouped under "other reasons", or 16 percent of total sales specifically mentioned financial problems as the reason for sale. When added to the 18 percent of sales due to a desire to reduce operation size, it seems reasonable to conclude that financial difficulties may have been the major reason for sale in up to 34 percent of the sales reported.

At a regional level, the greatest percentage of sales due to financial difficulties occurred in the Northwest, where 40 percent of all sales reported from that region listed financial difficulties or reduction in size of operation as the major reason for sale. The comparable figure for the Southwest district was 37 percent of all sales, and 38 percent in the Southeast district. The lowest percentage (22 percent) was reported for the Northeast region. These figures indicate that financial difficulties, broadly defined, were an important inducement to sales, accounting for between 22 and 40 percent of sales in the reporting districts.

As to other reasons, retirement was the reason most often given for sale in all districts except the Northwest, where only 14 percent of the sales were due to retirement while 21 percent of the sales reflected a decision to decrease the size of operation.

Table 12: Percentage of Sales By Reason For Selling Land, Minnesota, 1970-1985.

Year	Reason for Sale						
	Death	Retirement	Left Farming	Moved, Still Farming	Divorce*	Reduce* Size of Operation	Other
1970	20	39	22	6			13
1971	21	38	19	8			14
1972	20	39	20	8			14
1973	15	42	18	6			20
1974	15	46	12	10			18
1975	17	40	15	7			21
1976	16	41	14	9			19
1977	15	38	15	9			23
1978	14	39	16	10			21
1979	18	41	15	10			17
1980	16	39	12	10			23
1981	17	36	16	9			22
1982	17	32	11	3	2	23	11
1983	14	29	12	2	1	23	20
1984	16	22	13	2	2	25	20
1985	17	25	12	2	1	18	25

* These reasons were added to the survey in 1982.

Table 13: Price Differential Between Improved and Unimproved Land Sold, Minnesota, 1970-1985

Year	Improved Land dollars/acre	Unimproved Land	Difference	Price of Unimproved Land as a Percent of Price of Improved Land Percent
1970	254	200	54	79
1971	271	207	64	76
1972	308	236	72	77
1973	317	234	83	74
1974	454	438	16	96
1975	605	613	-8	101
1976	729	753	-24	103
1977	899	782	117	87
1978	1026	888	138	87
1979	1169	1088	81	93
1980	1327	1302	25	98
1981	1337	1417	-80	106
1982	1306	1428	-122	109
1983	1299	1282	17	99
1984	1202	1313	-111	109
1985	885	841	44	95

UNIMPROVED VERSUS IMPROVED LAND

Respondents were asked to distinguish between sales involving land and buildings and sales in which only land was involved. Improved land refers to sales including buildings and unimproved land refers to sales of farmland without buildings. In 1985, the statewide average sales price for improved land was \$885 per acre, while the average sales price for unimproved land was \$841 [Table 13]. From 1959 to 1974, the price

per acre of unimproved farmland as a percentage of improved land never went above 90 percent, with a high of 89 percent in 1965. Since the onset of the land boom in 1973-74, however, the relative price of unimproved land compared to improved land has fluctuated between 90 and 110 percent, with the exception of 1977 and 1978. Since 1980, the relative price of unimproved land has been at least 95 percent, and as much as 109 percent of the price of improved land. Historically, there has been a levelling out of the differences in the average prices of improved and unimproved land.

For reported sales in which the presence or absence of buildings was indicated, 57 percent involved unimproved land, while 43 percent involved improved land [Table 14]. The percentages of sales involving improved and unimproved land were approximately equal in the Southeast, West Central and East Central districts. The Northwest district showed a predominance of sales involving unimproved land, while the Northeast showed a prevalence of improved land sales. This is consistent with the characteristics of the districts. Expansion buyers, who accounted for 86 percent of the reported sales in the Northwest district in 1985, are typically uninterested in the presence of buildings, since they are adding lands to existing farms. In contrast, 33 percent of the reported sales in the Northeast district in 1985 went to sole-tract operators, who were not adding to existing land holdings. This group can be expected to be more concerned about the quality of buildings on the land. While expansion buyers also accounted for 39 percent of the sales in the Northeast district, this was the lowest percentage of sale to expansion buyers in any region in Minnesota. (See the following section.)

Table 14: Proportion of Sales and Average Sales Price Per Acre of Improved and Unimproved Farmland, By District, Minnesota 1984 and 1985.

District	Improved				Unimproved				Price of Unimproved Land as a Percent of Price of Improved	
	1984		1985		1984		1985		1984	1985
	%	\$	%	\$	%	\$	%	\$	%	%
Southeast	45	1409	53	1035	55	1361	47	977	.97	.94
Southwest	28	1562	36	1101	72	1713	64	1251	1.10	1.14
W. Central	33	1102	48	870	67	1037	52	875	.94	1.01
E. Central	64	648	49	545	36	633	51	470	.98	.86
Northwest	25	597	15	448	75	747	85	605	1.25	1.35
Northeast	75	233	78	286	25	121	22	106	.52	.37
Minnesota	37	1202	43	885	63	1313	57	841	1.09	.95

TYPE OF BUYER

The Minnesota Rural Real Estate Market Survey distinguishes three types of buyers. Expansion buyers are land owners who purchase farmland to add to their existing land holdings and who intend to hold the land as an operating farmer. Sole-tract operators are individuals who intend to farm the land they have purchased themselves and who are not adding to existing land holdings. Investors are broadly defined as individuals who do not intend to farm the land themselves; they may intend to rent out the land or hire a manager to oversee their purchase. Shifts in the activity of these three types of buyers are very helpful in understanding trends in the Minnesota rural land market. The steady rise in expansion buyer activity, for example, was one of the most prominent features of the land boom of the 1970's [Figure 3].

Figure 3. Percent of Reported Farmland Sales by Type of Buyer, Minnesota: 1954 - 1985.

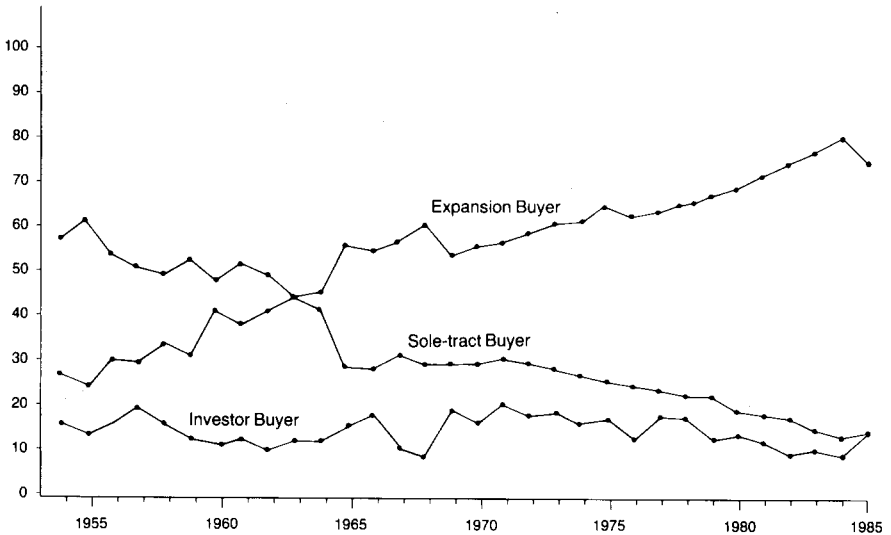


Table 15: Percentage of Sales and Average Sales Price Per Acre by Type of Buyer, by District, Minnesota, 1984 and 1985.

District	Sole-Tract Operator				Expansion Buyer				Investor Buyer			
	1984		1985		1984		1985		1984		1985	
	%	\$	%	\$	%	\$	%	\$	%	\$	%	\$
Southeast	17	1323	17	1064	69	1442	69	992	14	1213	14	1051
Southwest	3	1492	4	1000	91	1681	80	1192	5	1338	16	989
West Central	9	1129	16	775	85	1051	77	916	5	1120	7	817
East Central	33	680	29	471	51	664	60	551	15	521	11	507
Northwest	8	445	3	578	91	757	86	611	2	350	11	398
Northeast	38	358	33	284	38	190	39	246	25	197	28	129
Minnesota	12	1043	13	742	80	1319	74	915	9	1069	13	717

In 1985, expansion buyers were the most active in the land market, accounting for 74 percent of all sales reported [Table 15]. While expansion buyers retained their dominant position in the Minnesota land market, it is important to note that this figure represents a decline of 6 percentage points from the record high of 80 percent in 1984. This was the first drop since 1977 in the proportion of sales attributed to expansion buyers, and the largest drop in their market share since 1969. In contrast, the share of total sales going to operating farmers increased slightly to 13 percent, which was also the percentage of reported sales going to investors. Even more dramatic results can be seen by observing the changes in percentage of total acres purchased by each type of buyer. Expansion buyers accounted for 67 percent of all acres sold, down from 79 percent in 1984, while investors actually outpaced sole-tract buyers in total acres purchased.

These aggregate figures hide large disparities in district levels of market activity by various types of buyers. In the Southwest, for example, farm expansion buyers account for 80 percent of total sales in the region. This was exceeded only in the Northwest, where expansion buyers claimed 86 percent of sales. Sole-tract operators accounted for only 3 and 4 percent of total sales in the Northwest and Southwest districts, respectively, but captured 33 percent of the sales in the Northeast and 29 percent in the East Central district. Investors expanded their proportion of sales in the Northwest from 2 percent in 1984 to 11 percent in 1985, and in the Southwest from 5 percent to 16 percent.

To permit a closer analysis of market activity, the data were broken down into the 13 Economic Development Regions [Table 16]. In all but one region (Region 5), expansion buyers commanded the largest share of sales, accounting for over 76 percent of all sales in Regions 1,4,6W, 6E,8 and 9. These are the areas of the state in which cash crops predominate, and are least influenced by urban effects. In the agriculturally rich southern portion of the state, sole-tract operators made up a noticeable minority in reported sales for 1985; in Regions 6W, 8 and 9, sole-tract operators accounted for only 6, 6 and 2 percent of total regional sales, respectively. Investor buyers accounted for approximately 20 percent of all sales in Regions 3, 7E,8,10 and 11. The lowest percentage of sales attributed to investor buying was 7 percent, in Region 4.

TABLE 16: Percentage of Total Sales in Economic Development Regions by Type of Buyer, Minnesota, 1985

EDR	Sole Tract Operator	Expansion Buyer	Investor Buyer
----- Percent -----			
1	5	82	14
2	20	67	13
3	25	50	25
4	11	81	7
5	46	43	11
6W	6	84	10
6E	13	77	9
7W	31	61	8
7E	29	52	19
8	6	76	19
9	2	87	11
10	17	66	17
11	15	67	19
MN	13	74	13

LAND AND BUILDING QUALITY

The average sales prices for all qualities of land declined from 1984 to 1985, with the greater declines for land of lower quality [Table 17]. Land classified by respondents as "good" dropped 28 percent in average reported sales price per acre, "average" land fell 32 percent, and "poor" land dropped 38 percent. A conclusion that lands of marginal quality suffered the greatest declines must be tempered by the fact that the subjective opinions of respondents regarding land quality vary widely among individuals; lands of good quality to one may be lands of average or even poor quality to another. Even when the data from respondents are analyzed within a region, differences in opinion tend to limit the validity of highly aggregated statistics.

A more useful breakdown is provided by a classification of land quality by type of buyer [Table 17]. In 1985, 47 percent of all purchases by sole-tract operators involved land classified as average in quality, while 34 percent of their purchases involved good land. Purchases by investor buyers followed a similar pattern, with 40 percent of the transactions involving land of average quality and 38 percent involving land of good quality. Expansion buyers were more selective, with 47 percent of their purchases involving lands of average quality and 42 percent classified as good. Among the three classes of buyers, the smallest proportion of purchases involving poor land was reported for expansion buyers (11 percent). This continues a pattern that has prevailed since 1983. In prior years, sole-tract operators had typically reported the smallest proportion of purchases of poor quality land.

Table 17: Proportion of Purchases and Price Paid Per Acre by Type of Buyer For Land of Various Quality, Minnesota, 1984 and 1985

Type of Buyer	LAND QUALITY											
	Good			Average						Poor		
	1984 %	1984 \$	1985 %	1985 \$	1984 %	1984 \$	1985 %	1985 \$	1984 %	1984 \$	1985 %	1985 \$
Sole-Tract Operator	32	1281	34	939	53	978	47	688	15	739	20	481
Expansion Buyer	43	1512	42	1092	47	1239	47	852	9	774	11	525
Agricultural Investor	40	1357	38	1019	35	1129	40	725	25	570	22	317
All	42	1478	41	1061	47	1197	46	808	11	723	14	445

The relationship between building quality and type of buyer [Table 18] is consistent with the previous analysis. Over 60 percent of the purchases by sole-tract operators involved buildings of good or average quality. The presence of buildings can be especially important to the sole-tract operator, who presumably plans to live on the land purchased. In contrast, 67 percent of the sales to expansion buyers involved lands with no permanent structures and 21 percent involved land with buildings of good or average quality. For the state as a whole, sales involving good quality buildings made up 11 percent of all sales, 17 percent of sales involved lands with buildings of average quality, 14 percent had buildings of poor quality, and 58 percent of all sales were of lands with no buildings.

Again, these results must be interpreted with caution. Estimates of building quality are subjective, and can be expected to fluctuate among individuals. They do not represent an underlying uniform measure of quality.

TABLE 18: Proportion of Purchases and Prices Paid Per Acre by Type of Buyer for Land with Various Quality of Buildings, Minnesota, 1985.

Type of Buyer	Good		Building Quality				None	
	%	\$	Average %	Average \$	Poor %	Poor \$	%	\$
Sole-Tract Operator	30	871	34	754	21	579	15	622
Expansion Buyer	7	1229	14	935	12	798	67	875
Agricultural Investor	9	884	16	790	18	735	57	655
All	11	1051	17	863	14	745	58	820

METHOD OF FINANCE

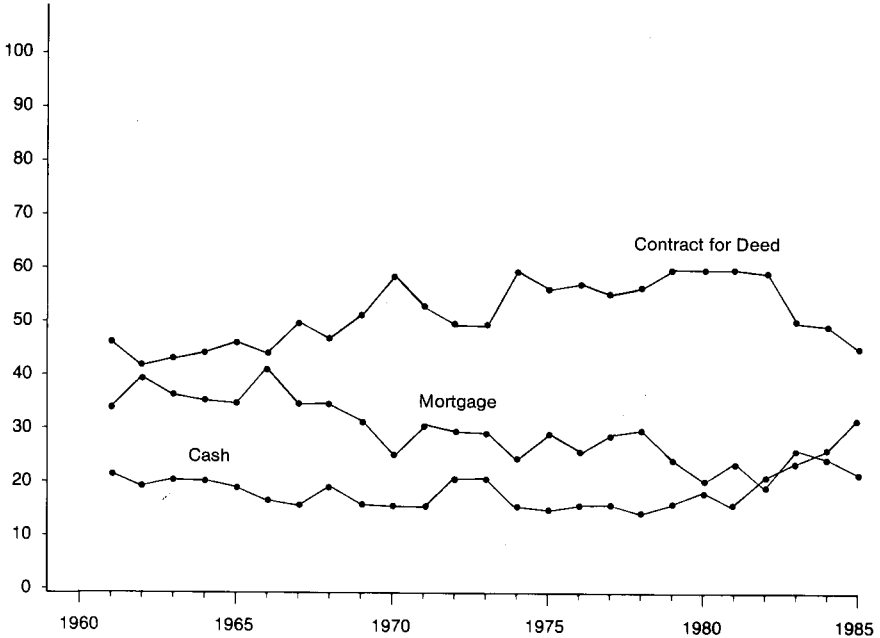
In 1985, contracts for deed were used to finance 46 percent of the sales reported, cash for 32 percent of sales, and mortgages financed the remaining 22 percent [Table 19]. These numbers represent a decline from 1984 levels in the use of contracts for deed and mortgages, and an increase of 6 percentage points in the frequency of cash sales. This continues a trend that has characterized the years of land value declines; the frequency of contract for deed financing has steadily fallen from 61 percent in 1981, while the proportion of cash sales has doubled, from 16 percent in 1981 to 32 percent in 1985. [See Figure 4]

Table 19: Proportion of Farm Sales by Method of Financing, By District, Minnesota, 1965, 1970, 1975, 1980-85.

Method of Financing	South-East	South-West	West Central	East Central	North-West	North-East	Minnesota
----- percent -----							
<u>Cash</u>							
1965	17	15	22	21	29	29	19
1970	15	13	14	19	20	31	16
1975	12	16	13	15	18	30	15
1980	14	22	11	16	31	33	18
1981	17	20	17	9	16	10	16
1982	20	24	20	15	28	9	21
1983	25	27	22	10	25	22	23
1984	23	31	23	19	25	13	26
1985	26	41	30	26	42	17	32
<u>Mortgage</u>							
1965	33	39	41	30	27	3	35
1970	19	23	28	28	40	26	25
1975	28	27	24	36	30	25	28
1980	21	24	25	12	19	12	20
1981	20	22	19	28	27	32	23
1982	17	22	17	13	22	23	19
1983	25	26	25	19	38	17	26
1984	19	25	28	22	39	13	24
1985	24	21	18	21	33	6	22
<u>Contract For Deed</u>							
1965	50	45	37	49	44	68	46
1970	66	64	58	53	40	43	59
1975	60	58	63	49	52	45	57
1980	65	54	63	72	50	55	61
1981	63	58	63	63	57	58	61
1982	63	54	62	72	50	69	60
1983	50	47	53	71	37	61	51
1984	59	43	49	59	36	75	50
1985	51	38	53	52	26	78	46

At first glance, these trends seem to contradict popular notions about the nature of financial stress in Minnesota agriculture. If many farmers are suffering financially, why is the frequency of cash sales increasing? One part of the explanation is that the increasing percentage of cash sales is associated with a sharply declining number of sales. Cash sales are not increasing in number (for the state as a whole) but the proportion of sales using cash has not declined as rapidly as sales using other instruments of finance. The figures suggest that agents active in the land market include an increasing proportion of buyers who are "debt averse", i.e. are reluctant to enter into new debt obligations. This is especially likely to be the case in sales involving smaller acreages. This interpretation is supported by the fact that the average acres per sale in cash transactions is smaller than the average acres per sale when either contracts for deed or mortgages are used to finance the sale.

Figure 4: Percentage of Reported Farmland Sales by Method of Financing, Minnesota, 1961 - 1985.



Who are the buyers using cash? The cash buyer is most likely to be an expansion buyer living within 10 miles of the tract purchased [Table 20]. Of the 37 cash buyers living further than 10 miles away, 22 were investor buyers. Sole tract operators, regardless of distance from the tract bought, were most likely to use contracts for deed and only 23 percent of sole-tract operators paid cash. Eighty-three percent of all cash sales involved buyers who were living less than 10 miles from the tracts purchased.

The relationship between financing mechanisms and average sales prices is also interesting. The average price per acre for sales using cash (\$820) was lower than the average sales price for sales involving either contracts for deed (\$856) or mortgages (\$866) [Table 21]. In all districts except the Northeast, prices per acre in sales financed with contracts for deed were higher than in cash sales. It seems clear that sellers have been willing to accept lower prices per acre in cash transactions, when the alternative has been a contract for deed. It is potentially misleading, however, to conclude that contracts for deed are always associated with higher prices per acre in specific transactions. When aggregate data are used, even at a district level, they tend to obscure the fact that contracts for deed are frequently used to finance the sales of higher priced lands.

Table 20: Number of Sales by Type of Buyer and Distance from Tract Purchased, Minnesota, 1985

	Cash		Mortgage		Contract For Deed		Other	
	< 10*	> 10*	< 10*	> 10*	< 10*	> 10*	< 10*	> 10*
Sole-tract	12	8	12	6	29	19	0	0
Investor	25	22	8	12	19	34	3	2
Expansion Buyer	140	7	107	4	185	13	13	1

* Distance in miles

Table 21: Average Sales Price Per Acre of Farmland by Method of Financing, by District, Minnesota 1980-85.

Method of Financing	South-east	South-west	West Central	East Central	North-west	North east	Minnesota
----- Dollars per Acre -----							
<u>Cash</u>							
1980	1774	1945	1109	694	877	319	1346
1981	2091	2058	1251	758	1084	397	1613
1982	1490	1992	1014	792	772	407	1326
1983	1367	1723	1058	476	825	328	1315
1984	1314	1520	1047	700	686	100	1254
1985	986	1063	733	454	539	237	820
<u>Mortgage</u>							
1980	1798	2066	914	610	720	443	1470
1981	1900	2021	1115	494	1039	514	1295
1982	1553	1909	1119	772	1240	379	1416
1983	1464	1932	1108	650	808	205	1332
1984	1375	1629	1041	761	797	185	1268
1985	969	1113	835	435	649	890	866
<u>Contract for Deed</u>							
1980	1883	1746	1144	594	717	415	1290
1981	1947	1910	1174	843	851	478	1318
1982	1879	2008	1223	790	834	413	1358
1983	1536	1907	1077	724	632	400	1263
1984	1417	1747	1119	605	648	229	1282
1985	1069	1194	946	552	552	179	856

Classifying sales according to method of financing and quality of land provides a further insight into the effect of financing on sales prices. At the statewide level, the contract for deed was consistently associated with the highest average sales price in 1985, for each category of land quality [Table 22]. For lands of average and poor quality, the lowest prices were paid in cash sales, while for good quality lands prices paid in mortgage sales were below the average price paid in cash sales. As noted above, these results must be interpreted carefully since judgments based on quality are highly subject to individual variation.

Table 22: Price Paid per Acre and Proportion of Sales, by Method of Financing and Quality of Land, Minnesota, 1984 and 1985

Land Quality Class	Method of Financing							
	Cash		Mortgage		Contract for Deed		All Sales	
	1984	1985	1984	1985	1984	1985	1984	1985
<u>Good</u>								
\$ per Acre	1441	1050	1463	1029	1506	1084	1482	1083
% of Sales	40	40	40	44	42	38	41	40
<u>Average</u>								
\$ per Acre	1228	746	1223	800	1191	833	1207	806
% of Sales	45	47	49	45	47	47	48	46
<u>Poor</u>								
\$ per Acre	785	402	799	465	718	473	719	454
% of Sales	15	13	12	12	10	16	11	14
<u>All Grades</u>								
\$ per Acre	1253	826	1273	868	1284	879	1261	863
% of Sales	100	100	100	100	100	100	100	100

DISTANCE OF BUYER FROM TRACT PURCHASED

In 1985 the median distance of the buyer's residence from the tract purchased was three miles, identical with the number reported for 1984 [Table 23]. As was reported in 1984, three miles is the lowest median distance ever reported in the Minnesota Rural Real Estate Market Survey. In addition, median distance of buyer from tract purchased declined in two of the six districts (East Central and Northwest). Five of the six districts reported a median distance equal to the state median distance figure, which is indicative of the uniformly localized nature of rural land markets across most of Minnesota. It is important to note, however, that the median distance is an imperfect measure of the degree of localized transactions.

Table 23: Percentage of Farm Land Sales by Distance of Buyer's Residence from Tract, by District, Minnesota, 1981-1985

Distance of Buyer's Residence from Tract Purchased	South-east	South-west	West Central	East Central	North-west	North-east	MN
	----- percent -----						
<u>Less than 2 miles</u>							
1981	24	27	17	13	15	13	21
1982	23	17	25	17	24	14	21
1983	22	17	18	28	15	29	20
1984	20	18	21	23	24	13	20
1985	25	25	21	29	19	19	24
<u>2-4 Miles</u>							
1981	31	37	29	18	27	13	30
1982	40	42	36	11	41	6	35
1983	34	44	30	14	46	19	35
1984	39	46	40	21	32	0	40
1985	34	41	35	33	43	25	37
<u>5-9 Miles</u>							
1981	20	18	24	8	26	10	19
1982	16	27	19	17	13	3	19
1983	23	23	27	16	14	5	22
1984	19	22	20	18	32	25	21
1985	21	21	21	12	22	6	20
<u>10-49 Miles</u>							
1981	18	12	16	25	17	10	17
1982	15	9	13	25	13	19	14
1983	16	13	19	28	15	19	17
1984	18	11	15	23	8	50	15
1985	16	10	21	14	8	6	14
<u>50-299 Miles</u>							
1981	6	4	14	26	8	32	10
1982	5	5	6	21	5	33	8
1983	3	2	6	12	5	19	5
1984	4	3	3	12	5	13	4
1985	1	2	1	10	3	0	3
<u>300 Miles and Over</u>							
1981	1	3	1	9	8	23	4
1982	1	0	1	8	6	25	3
1983	0	1	0	2	3	10	1
1984	1	0	1	2	0	0	1
1985	1	1	0	1	5	44	2
<u>Median distance in Miles</u>							
1981	4	3	5	15	5	55	4
1982	3	4	4	10	3	70	4
1983	4	3	5	6	3	5	4
1984	3	3	3	5	4	11	3
1985	3	3	3	3	3	27	3

In order to avoid errors associated with sole reliance on a median measure, sales have been classified into intervals of distance [Table 23]. Although there were small changes in 1985 in the proportions of sales to buyers living under 2 miles, 2 to 4 miles, and 5 to 9 miles from the tracts purchased, the aggregate percentage of sales to buyers living under 10 miles rose slightly, from 80 percent in 1984 to 81 percent in 1985. The localized nature of the market was especially pronounced in western districts, where sales to buyers living less than 10 miles from the tracts purchased accounted for 87 percent of all sales in 1985 in the Southwest and 84 percent in the Northwest. These data emphasize the fact that the Minnesota rural real estate market is highly local in nature.

A slightly different picture emerges when acres sold instead of number of sales are classified by distance [Table 24]. In 1985, buyers living less than 5 miles from the land purchased accounted for 54 percent of the acres reported sold; buyers living less than 10 miles from their purchases bought 74 percent of the acres sold, and 90 percent of all acres sold were purchased by buyers living within 50 miles. The remaining 10 percent of the acres sold went to buyers living more than 50 miles away. This represents an increase over the 7 percent of acres sold in 1984 to this group of buyers, but over half of the acres making up this 10 percent were sold in the Northeast district. The data, therefore, give no evidence of any shifts away from the localized nature of the land market in the principal agricultural areas of the state.

Table 24: Percentage of Acres Sold by Distance of Buyer's Residence From the Tract Purchased, Minnesota, 1985.

Distance of Buyer's Residence from Tract Purchased	South-east	South-west	West Central	East Central	North-west	North-east	MN
Less than 2 miles	21	25	24	27	19	5	22
2-4 miles	33	35	31	30	39	12	32
5-9 miles	23	24	20	16	21	3	20
10-49 miles	20	13	25	12	9	4	16
50-299 miles	1	2	0	12	4	0	2
300 miles and over	3	1	0	3	7	76	8

Part II: The Rural Real Estate Market in Southwestern Minnesota

As noted previously, the predominantly agricultural areas of the state experienced the greatest declines in both land values and average reported sales prices. While the agricultural regions of southern Minnesota are alike in some respects, there are significant differences among counties in terms of weather patterns, historical volatility of land values, quality of land, etc. By looking more closely at the southwestern quadrant of the state, we can see the impact that these differences have on relative declines in sales prices.

For the purposes of this study, southwestern Minnesota is divided into three sub-areas, based on relative crop yields and climatic conditions [Figure 5]. The Low-Risk area has historically had high land values and relatively stable weather patterns. The High-Risk area, on the other hand, has had lower land values over time and has also had greater fluctuations in climatic conditions. The Transitional area not only lies geographically between the other two regions, but also falls between the High-Risk and Low-Risk areas in terms of agricultural productivity and climatic variability.

The Low-Risk area (which, with Sibley and Le Sueur and without Jackson and Cottonwood counties, is coterminous with Economic Development Region 9) has had the highest average reported sales prices in the state for the past decade. This pattern changed in 1985, with an average reported sales price for the Low-Risk area of \$1354 [Table 25] that was below the average reported sales price for the Seven County Metro Area (\$1423). The average sales price for the Low-Risk area is also below the average reported sales price for Region 9, indicating that the inclusion of Sibley and Le Sueur counties and the exclusion of Jackson and Cottonwood counties in calculating the average sales price for this area of the state had a generally buoyant effect. As one would expect, the average sales price per acre of \$783 in the High-Risk area was substantially below that of the Low-Risk area. The figure for the Transitional area (\$1011) is between the average sales price for the Low-Risk area and the average sales price for the High-Risk area. We can see a consistent association between the agricultural productivity of the land, the relative stability of weather patterns, and land prices. The large declines in the land market since 1981 have not unhinged the relative characteristics of the rural real estate market in this area.

The data for 1985 also show a continuing trend noted in the survey for 1984: the gap between sales prices in the High-Risk and Low-Risk areas is diminishing. As a percentage of the average reported sales price per acre of land in the Low-Risk Area, both the High Risk and the Transitional average reported sales prices have been steadily increasing [Table 25]. This is strong proof that the differences in sales prices in the southwestern portion of the state are diminishing. The discontinuity in this trend occurs in the Transitional area from 1983 to 1984, and is explained by the disproportionate impact of the 1983 drought on the Transitional area. Disparities between the average size

TABLE 25: Analysis of Reported Farm Sales, High Risk, Transitional, and Low Risk Areas, S.W. Minnesota, 1981-1985.

Item	1981	1982	1983	1984	1985
		<u>High Risk Area</u>			
Number of Sales (Jan.-June)	167	114	118	109	75
Average Size Tract (acres)	191	158	162	167	151
Average Sales Price Per Acre (Dollars)	1159	1140	1016	1001	783
Avg. Sales Price as Percent of Low Risk Area Sales	42.0	45.1	47.4	51.2	57.8%
Changes in Sales Price Over Preceding Year	22	-2	-11	-1	-22%
		<u>Transitional Area</u>			
Number of Sales (Jan.-June)	226	180	231	281	145
Average Size Tract (acres)	156	136	150	127	140
Average Sales Price Per Acre (Dollars)	1680	1698	1590	1356	1011
Avg. Sales Price as Percent of Low Risk Avg. Sales Price	60.9	67.1	74.1	69.4	74.7%
Changes in Sales Price Over Preceding Year	8	1	-6	-15	-25%
		<u>Low Risk Area</u>			
Number of Sales (Jan.-June)	153	136	200	253	131
Average Size Tract (acres)	111	110	110	101	115
Average Sales Price Per Acre (Dollars)	2760	2529	2145	1954	1354
Changes in Sales Price Over Preceding Year	19	-8	-15	-9	-31%

Low-Risk areas have increased on average from 101 acres in 1984 to 115 acres in 1985, while the average size of tract sold in the High-Risk area declined from 167 acres to 151 acres.

The declines in the average reported sales price in 1985 for each region repeat the pattern of market activity witnessed for the state as a whole. In the High-Risk area the average sales price fell by 22 percent. Deflating with the Consumer Price Index, this drop represents a real decline of 25 percent (or 24 percent, using the GNP implicit deflator). The average sales price for the Low-Risk area, on the other hand, nominally fell by 31 percent (in real terms, approximately 33 percent). The Transitional area was between these two extremes with a nominal decline of 25 percent and a real decline of about 28 percent. These declines emphasize the conclusion that the richer agricultural areas in the state suffered a greater decline in land prices when measured by the average unadjusted reported sales price in 1985.

Across the areas, expansion buyers made most of the reported sales, ranging from 72 percent in the Transitional area to 83 percent in both the High-Risk and Low-Risk areas [Table 26]. In the Transitional area,

Table 26: Proportion of Sales and Average Price Per Acre, by Type of Buyer in the High Risk, Transitional, and Low Risk Areas, S.W. Minnesota, 1981-1985

Type of Buyer and Year	High Risk Area		Transitional Area		Low Risk Area	
	%	\$	%	\$	%	\$
Sole-Tract Operator						
1981	5	1165	13	1557	3	2763
1982	6	1246	11	1733	2	2447
1983	7	994	14	1249	4	1875
1984	6	1207	10	1190	2	1699
1985	8	499	14	900	4	1338
Expansion Buyer						
1981	88	1171	76	1752	93	2790
1982	83	1135	81	1742	94	2569
1983	85	1026	79	1678	92	2183
1984	83	996	85	1373	95	1979
1985	83	836	72	1061	83	1331
Investor Buyer						
1981	6	1172	10	1405	4	2765
1982	11	1127	8	1302	4	1617
1983	7	1052	8	1368	4	2368
1984	11	895	5	1330	3	2098
1985	8	748	14	900	13	1142

both sole-tract operators and investors increased their shares of the market, each accounting for 14 percent of the sales in this area. Both sole-tract operators and investor buyers made 8 percent of the purchases in the High-Risk area, while investors outpaced operating farmers (13 percent to 4 percent) in the Low-Risk area. Sole-tract operators captured a small increase in the percentage of total sales in all three areas. Expansion buyers experienced a decline in their share of total sales, most strikingly in the Transitional and Low-Risk area, with declines of 13 and 12 percentage points, respectively. The most significant aspect of these figures is the increase in the proportion of sales going to investor buyers in the Low-Risk and Transitional areas.

In all three areas, contracts for deed were the most popular financing arrangements, accounting for 42 to 52 percent of the sales [Table 27]. This represents an increase over the percentages for 1984 in two of the three areas. Cash sales also increased over the proportion of sales reported in 1984 and in the Low Risk area cash rivals contract for deed as the most popular financing instrument. In contrast, all three areas reported a decline in the popularity of mortgage financing.

The Southwestern land market, although primarily agricultural, exhibits many of the same variations noted earlier between agricultural and less-agricultural regions. Declines were greatest in the areas of the historically highest land prices and greatest agricultural productivity. Significant increases in investor buying occurred in the Transitional and Low-Risk areas. While contracts for deed were still the most popular mechanism for financing sales, the relative frequency of cash sales rose, while the use of mortgages declined.

Table 27: Proportion of Sales and Price Paid Per Acre, by Method of Finance, in the High-Risk, Transitional and Low-Risk Areas, S.W. Minnesota, 1981-1985

Method of Financing	High Risk Area		Transitional Area		Low Risk Area	
	%	\$	%	\$	%	\$
Cash						
1981	14	1335	19	1646	28	2893
1982	23	1085	25	1675	19	2502
1983	30	984	23	1497	26	2078
1984	30	1002	24	1085	35	1901
1985	33	730	34	855	38	1272
Mortgage						
1981	24	1042	19	1842	24	2583
1982	16	1160	21	1576	26	2546
1983	24	1106	19	1604	34	2226
1984	26	1010	25	1286	25	1941
1985	15	840	19	1031	20	1202
Contract for Deed						
1981	62	1165	63	1626	47	2680
1982	61	1149	54	1758	55	2495
1983	46	1002	58	1598	40	2175
1984	44	1051	51	1476	40	2029
1985	52	769	48	1075	42	1333

Part III: Population Growth Influences on the Minnesota Rural Real Estate Market

Recent observers of the Minnesota rural real estate market have noted that there seems to be a significant level of "exurban" activity. "Exurban" generally refers to land purchases made by individuals previously living in an urban area who have decided to settle in a rural, as opposed to suburban, area. As a rule, they do not abandon their current jobs in the city, therefore the farmland they purchase tends to be located relatively close to the city in which they work, or at least within a reasonable driving distance.

There are many reasons why exurban activity should increase in recent years. The rural land value declines of the past few years have put affordable rural land within the reach of many city-dwellers. In addition, the many members of the baby-boom generation are approaching their years of highest earnings, and have as a result found the finances necessary to purchase land away from the city. All this combined with the recent stabilization in fuel prices make commuting into the cities from nearby rural areas an attractive option for many urban residents.

The purpose of this special study is to find evidence of the presence and importance of population increases (both as a result of exurban and other influences) on the Minnesota rural real estate market. In order to find this evidence, we divided Minnesota into three regions [Figure 6]. The first two regions include all the counties in which population grew 5 percent or more in the three years after the 1980 census (1980-1984). These counties are divided into a northwestern area and a southeastern area. The northwestern Region 1 includes the counties of Beltrami, Hubbard, Becker, Ottertail and Douglas, and includes the cities of Bemidji and Fergus Falls. In this area we see primarily "Lakes" activity: individuals retiring in the area, individuals converting cottages and vacation structures into year-round dwellings, etc. The southeastern Region 2 contains Stearns, Benton, Sherburne, Wright, Anoka, Washington, Dakota, Scott, Carver, Hennepin and Ramsey counties and includes exurban influences from the Twin Cities, Sauk Centre, and St. Cloud. For the purposes of this study, Hennepin and Ramsey counties were excluded. During the past year, we received no usable reports from Anoka county, therefore it is not represented in these results. The third region consists of all the other counties in the state not in Region 1 or 2, and acts as a comparison region.

Comparing these regions on the basis of average estimated value of farmland per acre, we find little systematic differences between the three regions [Table 28]. While the average estimate of farmland value tended to be lower in Regions 1 and 2 overall than in the comparison region, this aggregate figure hides the differences between the relatively higher priced lands around the Twin Cities (Region 2) and the relatively lower priced lands of Region 1. The declines in average estimated value were larger in Region 1 than in Region 2, yet on the whole declines were less in the areas experiencing greater population growth than for the non-growth area (-22 percent for the former versus -26 for the latter).

**Figure 6. Population Growth Regions, Minnesota, 1980 - 1984
(Excluding Hennepin and Ramsey Counties).**

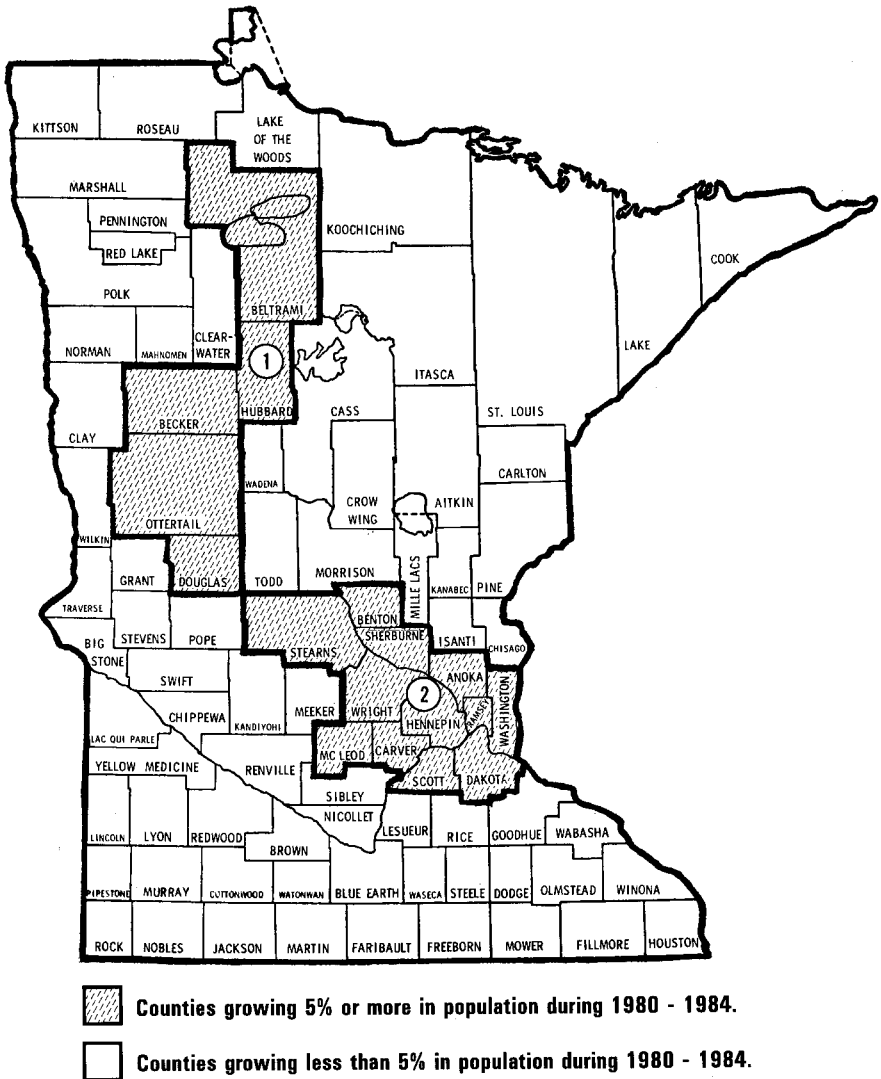


TABLE 28: Average Estimated Land Values Per Acre,
by Population Growth Regions, Minnesota, 1985

REGION	1984 (in dollars)	1985 (in dollars)	Percentage change
1	796	560	-30
2	1230	1020	-17
1 & 2	1012	788	-22
Non-growth Region	1160	856	-26

The differences between Region 1 and Region 2 are further emphasized when we look at average reported sales price per acre for these regions [Table 29]. While the average reported sales price, like the average estimated value, is lower in population-growth areas than non-growth areas (\$828 against \$867), the average reported sales price per acre was quite high for Region 2 (\$1062), while the average price per acre for Region 1 was much lower (\$466). The difference between these two figures can be traced to the relatively larger impact of the Twin Cities on outlying land markets, and to differences in agricultural productivity between the regions. Acres per sale tended to be smaller in both regions combined than in the non-growth region. This suggests an exurban and "Lakes" influence: individuals not primarily employed in the agricultural sector can be expected to purchase fewer acres than individuals whose livelihood comes primarily from farming. But between regions, we see that Region 1 has an average acre per sale ratio above the non-growth area average, while Region 2 has a fairly low acre per sale ratio (103 acres per sale). On the whole, this suggests a greater non-agricultural population influence in Region 2 than in Region 1.

All in all, data on land values and prices are poor indicators of exurban influences in regional land markets, primarily because the relationship between increased exurban influences and land values is ambiguous. For example, it is not immediately clear whether urban dwellers wishing to purchase rural land would be attracted by lower prices (thus we should expect to see greater exurban influence correlated with lower land values) or whether increased exurban influence acts to increase the price (increased demand leads to increased price). Untangling the exact relationship would take more space than is at present available. Instead, we shall look at the patterns of buying activity in the three regions in order to see whether unambiguous evidence of the influence of population growth on the Minnesota rural real estate market exists.

TABLE 29: Average Reported Sales Price Per Acre
by Population Growth Regions, Minnesota, 1985

Region	Number of Sales	Average Size of Tract (acres)	Average Reported Sales Price (dollars)
1	35	153	466
2	80	103	1062
1 & 2	115	118	828
Non-Growth Region	680	147	867

One excellent indicator is the percentage of sales in each region going to the different types of buyers. As previously explained, the Minnesota Rural Real Estate Market recognizes three types of buyers: sole-tract operators, expansion buyers, and investors. Of these three types, exurban and "Lakes" influences should be evident in an increased percentage of sales going to either sole-tract operators or investors. With reservations, this is what we indeed do see [Table 30]. In both growth regions, sole tract operators captured well over one quarter of all purchases, while in the comparison (non-growth) region sole tract operators only made 11 percent of the purchases. We also see less expansion buying the growth areas versus the non-growth areas (64 percent of sales in growth regions against 75 percent in the non-growth region).

TABLE 30: Percentage of Sales by Type of Buyer and
Population Growth Region, Minnesota, 1985

Region	Sole-Tract Operator	Expansion Buyer	Investor Buyer
	- - - - - percent - - - - -		
1	28	66	6
2	26	63	12
1 & 2	26	64	10
Non-Growth Region	11	75	14

A second useful way to gauge the level of activity in regional land markets is to look at the distance of buyer from tract purchased [Table 31]. Since exurbanites often have jobs in the city, or at least still require easy access to urban areas, we would expect to see increased levels of participation of non-local buyers in Region 2; similarly, those retiring in the northwest or converting vacation homes there would tend to be non-local purchasers of land. This is what we do in fact observe, once we break down sales by local buyers (those living less than 10 miles away from the tract purchased) and non-local buyers (those living 10 miles or more away from the tract purchased). Non-local buyers accounted for 26 percent of the sales in the growth regions, compared to only 18 percent in the non-growth regions. For Region 2, the percentage of sales going to individuals living 10 to 49 miles away from the tract purchased accounted to almost as great a percentage of sales as those going to individuals living 2 to 4 miles from the tract purchased. Since this 10-49 mile radius represents "comfortable commuting time," we may take this relatively high level of non-local activity as a sign of exurban activity in southeastern Region 2.

This special study has thus found some evidence of significant population growth influences in the Minnesota rural real estate market. While there was some measurable effect as a result of "Lakes" activity in the northwestern Region 1, we find that most of the effects were felt in the Southeastern Region 2. This nicely corroborates the analysis in the January, 1985 issue of the MINNESOTA AGRICULTURAL ECONOMIST, in which the significant buoyant effects of the Twin Cities area on nearby county land markets was investigated. Indeed, while many of the outlying areas of the Greater Metropolitan Area did not experience rapid population increases recently, the land market activities in these outlying areas can also be explained by reference to urban influences on the rural land market.

TABLE 31: Percentage of Sales By Distance of Buyer from Tract Purchased, By Population Growth Regions, Minnesota, 1985

Distance (miles)	Rgn. 1	Rgn. 2	Rgns. 1 & 2	Non-Growth Region
	- - - - - percent - - - - -			
less than 2	37	39	38	22
2-4	33	26	28	39
5-9	4	10	8	22
10-49	15	24	22	13
50-299	0	1	1	3
> 300	11	0	3	2

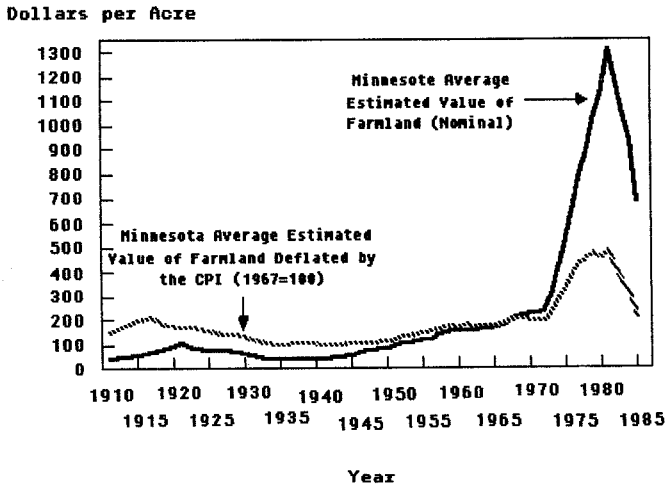
Part IV: Deflated Estimated Farmland Values, 1910-1985

While data on the estimated value of farmland per acre in nominal (i.e. current) dollars provide information about current market trends, they do not lend themselves easily to comparisons with previous years. One way to achieve this comparison is to deflate the figures, using dollars of constant purchasing power. Since the data series extends back to 1910, a deflated time series yields a 75-year picture of the major relative shifts in real values in the Minnesota land market, with the effects of inflation removed [Figure 7].

The purpose of this section is two-fold. First, Table 32 presents the results of deflating the time series of the average estimated value of farmland per acre for each of the six land market reporting districts. This is the first time that these deflated figures have been published on a disaggregated or district basis. Second, the data are used as a basis for assessing the relative volatility of land markets in the several districts. By looking at real levels of estimated land values, it is possible to assess the volatility of land values independent of fluctuations in the inflation rate.

Figure 7

Minnesota Average Estimated Value Per Acre of Farmland Deflated by the Consumer Price Index (1967 = 100), 1910 - 1985



Deflation has been accomplished by using the average annual Consumer Price Index, with 1967 as the base year. While use of this deflator, based on national data, introduces some uncertainty into the interpretation of deflated values in Minnesota in the years before about 1930 it is the only usable deflator available for the entire period from 1910 to 1985. A comparison with real values obtained by use of the GNP deflator for Personal Consumption Expenditures would be desirable, but that deflator is available only for the years since 1929.

Among the six land market reporting districts, trends in real values were closest in the southwest and southeast districts. There were only three years, 1940-1941, and 1971, in which the direction of change in the average estimated real value of farmland was not the same for both districts. These two districts tend to dominate the trends in statewide real land values, and have done so for 75 years. Only in 1963 were the declines in real average estimated value per acre of land in the southeast and southwest districts unmatched by declines in the statewide figure. These patterns are not unexpected, since the two southern districts contain the largest acreage of high-valued agricultural land in the state and this has been true since the years of early settlement.

Trends in real average estimated values of farmland have been much more variable in the rest of the state. From 1944 to 1979, the statewide real average estimated value of farmland declined in only 6 of the 35 years. In this era of relatively continuous appreciation in land values, the Northeast saw declines in 12 years, the Northwest in 11 years, and the West Central district in 10 years, while declines were recorded for only 5 years in the East Central district. The relative stability of value trends in the East Central district during this period reflects a variety of historical factors, including extensive highway construction in the area and expectations of appreciation in land values due to the spreading urban populations of the Twin Cities. When these factors changed, with the near-completion of interstate highway construction and the choking off of exurban influences from the Twin Cities due to rising fuel prices in the 1970's, the rate of increase in real values slowed markedly in the East Central district. In the heyday of the land boom era, from 1972 to 1981, real values of farmland more than tripled in the Northwest district, and more than doubled in all other districts except the East Central, where real values in 1981 (the year in which statewide values peaked) were only 92 percent above their level in 1972.

Looking at the patterns of market activity over all districts since 1910 gives evidence of the relative volatility of the Minnesota rural real estate market. In order to analyze the issue of volatility more formally, we have calculated four statistics which, taken together, give a fairly adequate view of the volatility of the land markets of the reporting districts. These four statistics are: the coefficient of variation (the sample standard deviation divided by the sample mean, and multiplied by 100 to convert the quotient into percentage form), the maximum and minimum deflated average estimated land value reached in each district and the state from 1910-1985, and a volatility index indicating the number of years in which the direction of change in real average estimated land values changed from positive to negative, or vice versa.

Table 32: Average Estimated Value Per Acre, By Districts, Deflated by the CPI, Minnesota, 1910-1985

Year	South-east	South-west	West Central	East Central	North-west	North-east	MN
- - - - - in 1967 dollars - - - - -							
1910-11	207	193	139	86	86	39	146
1912-13	238	238	159	100	100	45	169
1914-15	272	279	186	113	106	47	193
1916-17	281	306	205	125	113	46	208
1918-19	259	262	173	111	89	40	182
1920-21	235	253	163	113	95	40	173
1922-23	227	237	163	112	88	46	169
1924-25	203	215	145	96	86	43	152
1926-27	200	206	136	92	68	42	143
1928-29	195	199	131	86	64	41	138
1930-31	176	176	102	72	44	36	120
1932-33	156	159	103	66	49	34	110
1934-35	130	145	95	65	55	37	100
1936-37	142	154	92	70	53	58	106
1938-39	142	161	88	66	52	59	107
1940-41	140	162	86	62	53	57	102
1942-43	133	156	82	59	49	51	98
1944-45	148	171	91	66	55	53	106
1946	150	178	96	67	56	55	111
1947	143	173	93	64	55	52	108
1948	144	179	96	65	57	53	110
1949	150	190	102	69	62	55	116
1950	151	196	105	69	64	55	118
1951	161	213	114	76	69	59	127
1952	165	220	121	82	86	53	135
1953	162	218	119	77	80	50	131
1954	173	232	123	82	89	50	140
1955	187	256	128	85	91	56	151
1956	192	263	131	86	93	52	155
1957	196	273	145	91	102	58	164
1958	207	279	142	97	104	75	170
1959	219	292	153	102	118	66	180
1960	212	280	150	106	112	72	175
1961	223	292	157	112	118	76	184
1962	212	276	152	109	115	76	175
1963	212	268	155	112	124	74	176
1964	222	271	156	119	124	64	179
1965	232	276	154	119	120	54	181
1966	249	285	157	126	115	60	188
1967	262	303	163	128	108	62	194
1968	275	320	174	129	117	55	203
1969	283	321	180	134	110	50	205

Table 32: Average Estimated Value Per Acre, By Districts, Deflated by the CPI, Minnesota, 1910-1985 (Continued)

Year	South-east	South-west	West Central	East Central	North-west	North-east	MN
- - - - - in 1967 dollars - - - - -							
1970	273	299	171	139	103	53	196
1971	275	290	169	128	98	52	192
1972	296	303	166	130	94	61	198
1973	326	345	186	146	110	86	224
1974	392	459	257	190	135	98	288
1975	418	524	312	184	183	101	326
1976	502	649	366	205	222	123	391
1977	566	725	402	229	225	154	437
1978	610	727	411	225	247	156	455
1979	668	745	406	263	275	169	478
1980	618	709	390	241	277	158	454
1981	627	765	417	249	298	169	481
1982	520	649	361	202	259	167	408
1983	454	559	329	188	221	138	357
1984	374	450	281	162	188	140	298
1985	267	300	214	116	158	112	213

The coefficients of variations for the 6 reporting districts and the state are reported in Table 33. In general, the more volatility there is in any district land market, the greater the deviation from the mean of the deflated average estimated value of land in that district, and therefore the higher the coefficient of variation. Using this approach, the most volatile district in the state was the Northwest (55.69%). From most volatile to least volatile, the districts are ranked Northwest, Southwest (54.20), Northeast (53.28), Southeast (52.61), West Central (52.60), and East Central (45.42).

These relative rankings accord with a more casual observation of the volatility of the districts in many respects. As we have reported earlier in this report, the Northwest and Northeast districts have fairly volatile land markets; this is reflected in the higher coefficients of variation for these two districts. One surprising result of the rankings is the rather high level of volatility given to the southern districts. This is partially a relic of our statistical technique. The standard deviation (and, consequently, the coefficient of variation) is very sensitive to extreme figures, both high and low. Land values in the southern districts tend to swing rather widely. For example, in the Southwest district, the deflated average estimated value of land jumped from \$193 in 1910-1911 to \$306 in 1916-1917, and then fell to \$145 in 1934-1935. In the beginning of the 1970's, the deflated average estimated land value for the Southwest was a little below \$300 an acre; by 1979 the figure was up to \$745, a gain of almost 250%. These extreme values tend to drive up the coefficient of variation figure.

One method of analyzing the presence of extreme values is to find the maximum and minimum values, which are presented in Table 33. Subtracting the minimum value from the maximum value gives the range of deflated average estimated values of farmland per acre in each district. The ranking of regions from greatest to least range gives the same relative ranking as the highest to lowest average estimated land values since 1944-45 [Southwest, Southeast, West Central, Northwest, East Central, and Northeast]. This accents the relatively volatile land market in northern Minnesota. In order to have higher coefficients of variation in the northern districts than in the south, average land value estimates in the north had to vary quite a bit within a narrow range of values. The interesting aspect of the rankings according to the coefficients of variation, then was not that the Southwest and Southeast districts were ranked so very high, but rather that the Northern districts were able to rival and surpass the coefficients of variation of the south.

Table 33: Measures of Volatility in Real Average Estimated Land Values Per Acre, By District, Minnesota, 1910-1985

	South- east	South- west	West Central	East Central	North- west	North- east	MN
Coefficient of Variation ^{1/}	52.61	54.20	52.60	45.42	55.69	53.28	52.26
Maximum ^{2/}	668 (1979)	765 (1981)	417 (1981)	263 (1979)	298 (1981)	169 (1979, 1980)	481 (1981)
Minimum ^{2/}	130 (1934 -1935)	145 (1934 -1935)	82 (1942 -1943)	59 (1942 -1943)	44 (1930 -1931)	34 (1932 -1933)	98 (1942 -1943)
Volatility ^{3/} Index	17	17	21	19	21	25	17

^{1/}The Coefficient of Variation is the standard deviation of real average estimated land values per acre divided by the mean of the real average estimated land values per acre, and multiplied by 100 to convert the quotient into percentage form.

^{2/}The number in parentheses gives the year in which the given maximum or minimum occurred.

^{3/}The Volatility Index measures the number of years in which trends in the real average estimated land value in the district changed direction.

One difficulty with both the coefficient of variation and the range is that they fail to take into account the relative changes over time in land values. These relative changes are crucial to what one normally considers volatile. As an extreme example, consider two districts, both of which have exactly the same land value figures, although not at the same time. In the first district, land values go from the minimum to the maximum land value in a fairly steady appreciation. In the second district, land values erratically jump between high and low values. One would consider the second district more volatile than the first, yet both districts would have exactly the same coefficient of variation and range.

One statistic which is sensitive to the relative changes in the deflated average estimated values of land is the "volatility index," reported in Table 33. The volatility index gives the number of years in which the percentage change in the real average estimated value of farmland changed in sign. Thus, the more years in which the real average estimated value of farmland in a district changes direction (say, increases in one year, then decreases, then increases, etc.) the higher the volatility index. By this statistic, the ranking of districts from most volatile to least volatile is the Northeast (25), the Northwest and the West Central (21), the East Central (19), and the Southeast and Southwest (17).

The information from the volatility index helps characterize the nature of the volatility in the 6 reporting districts. In the Northeast and the Northwest, we see a great deal of variation within a relatively narrow range of real land values. In contrast, the Southwest and Southeast districts exhibit larger but steadier swings in land values. These larger swings tend to drive up the typical statistics for sample variability, but are unrepresentative of the underlying stability in the real land values in the southern districts. By contrast, the northern districts exhibit much of the unpredictable variability in real land value that is usually associated with volatile land market activity.

Part V: Land Value Declines: Total Estimates and Impacts on
Non-Owner Operated Land Values

Recent declines in the value of Minnesota farmland raise two very important questions. First, how large have the declines been? Earlier sections of this report have quantified the declines based upon the average estimate of farmland value per acre and the average reported sales price. This section looks at declines in the total value of farmland in Minnesota from 1980 to 1985. Using this method, we can quantify the decrease in the amount of asset value represented by Minnesota farmland. A second question is: Given these declines, which tenure group has been hurt the most? In order to narrow this question, we look at the relationship between percentage declines in average estimated land value and average reported sales price per county and the predominance of non-owner operated land in that county.

The base for the calculation of the total value of Minnesota farmland for the years 1980-1985 is the average estimated value per acre of farmland in each county for each year. This estimate of average value per acre was multiplied by the number of farmland acres in that county (from the U.S. Census of Agriculture), and then summed over all counties in the state to arrive at a total value. Hennepin and Ramsey counties are excluded from this figure. For the few counties in which there were no respondents in a given year to this annual survey, the county average land values from the 1982 Census of Agriculture were adjusted up or down by the percentage changes in land values from 1982 to that given year for the district in which the county was located. For counties for which the Census of Agriculture did not report farmland acreage figures, an average acreage of land in farms as reported for the preceding and succeeding Census years was used as a proxy.

The total value of Minnesota farmland from 1980 to 1985 is given in Table 34. Expressed in current dollars, the total value of Minnesota farmland in 1985 was \$22,902,922,662, representing a nominal percentage decline of 26 percent from the 1984 global value of \$30,632,542,722 and a dollar decline of \$7,729,620,060. In other words, the decline from 1984 to 1985 wiped out over 7.7 billion dollars of farmland asset value. Since 1981 the declines have eroded 45 percent of Minnesota farmland values, for a nominal dollar decline of \$18,977,087,180. In the years between 1981 and 1985 there was an acceleration in the percentage decline in global land values. The nominal declines between 1981 and 1982, and between 1982 and 1983 wiped out less than 10 percent of the global value of land in each of the two years. This figure increased to 13 percent between 1983 and 1984, to reach a high of 26 percent from 1984 to 1985.

These figures are in nominal dollars. Deflating the values by the Consumer Price Index for the first six months of each year (January through June) provides a rough picture of the trends in real total land values. The real total value of Minnesota farmland in 1985 was \$7,172,180,080 in 1967 dollars, representing a real decline of 28 percent in the total land value from 1984 to 1985, and a real drop of over 2.7 billion dollars [Table 35]. From 1981 to 1985, the real total value of Minnesota farmland dropped 50 percent, representing a decline

Table 34: Total Value of Minnesota Farmland, Nominal and Deflated by CPI, 1980-1985.

Year	Nominal Dollars				CPI (deflator)	Real Total Values (1967 dollars)			
1980	34	692	734	385	240.73	14	411	471	100
1981	41	880	009	842	265.98	15	745	548	500
1982	38	213	466	441	286.83	13	322	688	200
1983	35	065	716	782	295.07	12	300	739	000
1984	30	632	542	722	308.05	9	944	016	470
1985	22	902	922	662	319.33	7	172	180	080

of over 7 billion dollars. Between 1981 and 1985 there was a more varied acceleration in real total land value declines than took place in the nominal figures. Between 1982 and 1983, the percentage decline in the real total value of farmland slowed from -15 percent in 1981-1982 to -8 percent in 1982-1983. This deceleration was more than compensated for by the large declines in real value in 1984 and 1985.

Since these figures represent the total levels of land values, they hide the discrepancies among the districts in total declines in farmland capital. They do make quite clear the large decreases in total farmland capital in Minnesota over the past four years.

We shall now consider the relative impact of these declines in counties where non-owner operated land predominates owner-operated land in acreage. Patterns of land ownership and tenure are not specifically addressed by the Minnesota Rural Real Estate Market Survey, but useful comparisons can be made with statistics on the various types of tenure arrangements in Minnesota and the amount of acreage operated under each type of arrangement as reported in the U.S. Census of Agriculture. By comparing these statistics with information on the declines in land values in various counties across the state, it is possible to determine the association between the relative amount of rented land in a county and the severity of the land price declines in that county.

Even a casual inspection of recent trends in district land values from 1981 to 1985 suggests some association between the predominance of renting and severity of land value declines from peak values in 1981 and 1982 to 1985 [Table 36]. The largest nominal declines from the peak years to 1985 occurred in the Southeast and Southwest districts, with declines of approximately 50 percent and 54 percent respectively. Since these districts also have the highest proportions of non-owner operated land, a further statistical analysis of the relationship between renting and declines in land values is warranted.

Table 35: Percentage and Dollar Changes in Total Value of Minnesota Farmland, Nominal and Deflated by CPI, 1980-1985.

	% Change	Nominal			Deflated by CPI				
		Dollar Difference			% Change	Dollar Difference			
1980-1981	+21	+ 7	187	275	457	+ 9	+ 1,334	077	400
1981-1982	- 9	- 3	666	543	401	-15	- 2,422	860	300
1982-1983	- 8	- 3	147	749	659	- 8	- 1,021	949	200
1983-1984	-13	- 4	433	174	060	-19	- 2,356	722	520
1984-1985	-26	- 7	729	620	060	-28	- 2,771	836	390
1981-1985	-45	-18	977	087	180	-50	- 7,239	291	020

Table 36: Percentage Change in Estimated Average Value of Farmland Per Acre, by District, Minnesota, 1981-1985^{a/}

District	Estimated Average Value Per Acre		Percentage Change
	1981	1985	1985/1981
	(Dollars Per Acre)		(Percent)
Southeast	1709	861	-50
Southwest	2083	967	-54
West Central	1135	690	-39
East Central	679	374	-45
Northwest	813	510	-37
Northeast	483 ^{b/}	362	-25
Minnesota	1310	686	-48

^{a/} Douglas Dion and Philip M. Raup, "The Minnesota Rural Real Estate Market in 1985", Minnesota Agricultural Economist, No. 650, January 1986.

^{b/} Data for 1982, the peak year in the Northeast.

The relationship between land price declines and tenure arrangements can be important for many reasons. One major reason is that large declines in the going price of land diminish the wealth of landowners but not necessarily the wealth of tenants, if landowners do not attempt to recoup their losses in the land market by increasing rents. The ability of the landowner to recoup these losses through increasing rents is limited by two important factors: first, the difficulty involved in altering a contract already made, and second, the ability of the renter to pursue more profitable arrangements. With current declines in land prices, interest rates, and fuel costs, individuals currently renting may find it easier to take advantage of relatively cheaper land, or at least use the prospect of buying cheaper land to dissuade the landowner from restructuring rental agreements to the renter's disadvantage. To the extent that renting is associated with non-agricultural capital (e.g. investor-owned land), large land price declines in major renting areas may represent a greater threat to the stability of non-agricultural capital than to agricultural capital.

To determine the exact relationship between renting and price declines, we first calculated percentage changes in reported average sales prices for all counties in Minnesota from which sales were reported for both 1984 and 1985. This produced percentage changes in prices for 72 of the 87 counties in Minnesota. For each of these counties, a county ratio of rented-to-owned land was calculated as follows, from data supplied by the 1982 Census of Agriculture. First, we summed the total acres in each county listed in the census as being operated by full owners plus the owned portion of land in farms operated by part owners. Second, we summed the total acres in each county operated by full tenants plus the rented portion of land in farms operated by part owners. Dividing the second sum by the first gave the ratio of non-owner operated land to land owned by farm operators, for each county. While the resulting numbers reflect patterns of operator ownership arrangements that existed in 1982 and our percentage changes reflect one-year changes in prices from 1984 to 1985, it is reasonable to assume that the pattern of tenure arrangements in the counties studied has not changed sufficiently enough to distort the analysis.

To estimate the relationship between the percentage change in average reported sales prices and ratio of rented to owner-operated land, use was made of the (Spearman) rank-order correlation coefficient, which can vary between -1 and +1. A correlation coefficient of 0 implies that there is no relationship between the rank order of two series of variables, -1 implies that as the rank of one variable decreases the rank of the other increases, and +1 implies that as the rank of one variable increases the rank of the other increases as well. A rank-order correlation looks at the relationship between the orders of the variables. To take an example, if Farm A has the highest yield of three farms, Farm B has the second highest yield, and Farm C has the lowest yield, and Farm A used the most fertilizer, Farm B less than Farm A, and Farm C the least fertilizer of all three farms, there would be a rank-order correlation coefficient of +1 between yield and fertilizer use. A rank order correlation coefficient does not reveal the absolute levels of variables (yields, pounds of fertilizer), but only the relative rankings of the variables.

Comparing the percentage change in average sales prices for all counties with the ratio of non-owner operated to owner-operated land, we found a rank-order correlation coefficient of -.23 [Table 37]. This

Table 37: Spearman Rank-order Correlation Coefficients, Rent-to-Owned Land Ratio and Percentage Decline, 1984-1985 and 1982-1985, Minnesota

	Correlation Coefficient	Significance Level
% Change Average reported sales price, 1984-85, all counties	-.23043	5.15%
% Change Estimated Land Values, 1984-85, all counties	-.24066	3.62%
% Change Average estimated value per acre, 1981 to 1985	-.31561	0.55%

implies that as the rank order of the ratios of acres rented to acres owned increases (relatively more acres rented than owned in a county), the rank order of the percentage change in average reported sales price per acre for the county decreases. In other words, counties having a greater relative proportion of rented land tended to have the greater relative declines in land prices. The correlation coefficient for the calculated statistic had a significance level of slightly over 5%. (Significance levels of 5 percent or under are generally considered acceptable.) By this test, there does not appear to be a very significant level of association between the prevalence of non-owner operated land in an area and the severity of the decline in the average reported sales price per acre.

This correlation only looked for relationships between average reported sales prices and the predominance of rented acreage in a county. A more stable and representative figure to measure the decline in land value in a county is given by the percentage change in respondents' estimates of the average per acre value of an average farm in their county. As noted above, to calculate the percentage changes in estimated farmland values, reports were used only from respondents who reported for both 1984 and 1985. The percentage change in the estimated value of farmland in a county is calculated by comparing the average estimates given by respondents for the current year and the average estimates those same respondents gave for the previous year. Since individuals are asked to provide estimates on the value of rural land across the whole county, this figure is likely to be more representative of the land values of the county as a whole and not as subject to the irregularities that frequently occur in sales prices.

The correlation between the percentage change in estimated average land values in each county and the ratio of rented-to-owned land was $-.24066$, with a significance level of 3.62 percent [Table 37]. This correlation is stronger evidence of a negative relationship between the order of percentage changes in land values and the order of rented-to-owned land ratios across counties. This figure suggests that counties in which the amount of land operated by renters was greatest were also counties with the greatest percentage declines in land values.

For our final statistical analysis, we looked at the rank-order correlation between the percentage change in estimated county land values from 1981 to 1985 and the county rented-to-owned land ratio from the 1982 Census of Agriculture. While these Census figures on tenure arrangements apply to the 1982 Minnesota land market, they are the best available statistics on tenure arrangements for the 1981 Minnesota land market. Our results showed a Spearman rank-order correlation coefficient of $-.31561$ with a significance level of 0.55 percent. This is the strongest evidence we have of a negative relationship between the order of percentage declines (from lowest to highest declines) and the order of rented-to-owned land ratios (from greatest to least predominance of renting). Thus, we see a strong relationship between the predominance of non-owner operated land and the percentage decline in average sales price from 1984 to 1985.

It is important not to overstate these findings. In particular, while we have discovered a relationship between the predominance of renting and percentage declines in land values, we have not quantified that relationship; we have not shown that a certain increase in renting is associated with a certain percentage decline in land values. It would be incorrect to infer from these results that non-owner operated land in a given county fell in value more than owner operated land in that same county. Finally, we have not established any causal link between our variables. Thus, these figures should not be interpreted to mean either that large declines in land values cause a greater predominance of renting or that a greater predominance of renting causes large declines in land values. A significant correlation coefficient between two variables may mean that the causal link runs in either direction, or even no direction at all, if both variables are related to another, unincluded variable.

Statistical Appendix

One disadvantage in the use of aggregate data is that the resulting averages do not reflect the variation in the actual data. For example, the statewide average sales price per acre of farmland in 1985 was \$862, but this figure does not tell us whether or not most of the respondents reported average sales prices close to that figure or whether some respondents reported sales involving high priced land and other respondents reported sales involving very low priced land, which averaged to \$862.

A useful measure of variability, the standard deviation, is given in Table 40. The standard deviation gives the dollar range within which approximately two-thirds of the reported sales prices fall. For example, in the Southeast region, the average reported sales price in 1985 was \$1012.50, and the standard deviation of reported sales prices for that region was \$383.80. This indicates that approximately two-thirds of the sales prices per acre reported in the Southeast during the first six months of 1985 fell between \$629 and \$1396. Table 40 also presents another measure of variability, the coefficient of variation. The coefficient of variation is computed by dividing the standard deviation by the average price for each district, and multiplying by 100 to arrive at a percentage figure. In the above example, the coefficient of variation is 37.9. Larger coefficients of variation reflect larger variations about the average reported price.

Table 38: Average Estimated Value Per Acre of Farm Real Estate in Minnesota by Districts, 1910-11 through 1944-45, by Two-Year Periods, and Annually, 1946 through 1985

Years	South-east	South-west	West Central	East Central	North-west	North-east	Minnesota
1910-11	58	54	39	24	24	11	41
1912-13	69	69	46	29	29	13	49
1914-15	82	84	56	34	32	14	58
1916-17	92	100	67	41	37	15	68
1918-19	117	118	78	50	40	18	82
1920-21	141	152	98	68	57	24	104
1922-23	114	119	82	56	44	23	85
1924-25	104	110	74	49	44	22	78
1926-27	106	109	72	49	36	22	76
1928-29	100	102	67	44	33	21	71
1930-31	88	88	51	36	22	18	60
1932-33	64	65	42	27	20	14	45
1934-35	52	58	38	26	22	15	40
1936-37	59	64	38	29	22	24	44
1938-39	60	68	37	28	22	25	45
1940-41	59	68	36	26	22	24	43
1942-43	65	76	40	29	24	25	48
1944-45	78	90	48	35	29	28	56
1946	88	104	56	39	33	32	65
1947	96	116	62	43	37	35	72
1948	104	129	69	47	41	38	79
1949	107	136	73	49	44	39	83
1950	109	141	76	50	46	40	85
1951	125	166	89	59	54	46	99
1952	131	175	96	65	68	42	107
1953	130	175	95	62	64	40	105
1954	139	187	99	66	72	40	113
1955	150	205	103	68	73	45	121
1956	156	214	107	70	76	42	126
1957	165	230	122	77	86	49	138
1958	179	242	123	84	90	65	147
1959	191	255	134	89	103	58	157
1960	188	248	133	94	99	64	155
1961	189	247	133	95	100	64	156
1962	192	250	138	99	104	69	159

Table 38. Average Estimated Value Per Acre of Farm Real Estate in Minnesota by Districts, 1910-11 through 1944-45 by Two-Year Periods, and Annually, 1946 through 1985. (con't).

Years	South- east	South- west	West Central	East Central	North- west	North- east	Minnesota
1963	194	246	142	103	114	68	161
1964	206	252	145	111	115	59	166
1965	219	261	146	112	113	51	171
1966	242	277	153	122	112	58	183
1967	262	303	163	128	108	62	194
1968	286	333	181	134	122	57	211
1969	308	350	196	146	120	54	223
1970	317	347	198	161	120	62	227
1971	333	351	204	155	119	63	232
1972	370	379	208	163	117	76	248
1973	433	459	247	194	146	115	298
1974	576	675	378	279	199	144	423
1975	674	844	503	296	295	163	525
1976	856	1106	624	349	378	210	667
1977	1027	1316	730	415	427	279	794
1978	1191	1421	803	498	483	304	889
1979	1453	1620	883	573	599	368	1040
1980	1526	1750	962	596	683	390	1120
1981	1709	2083	1135	679	813	460	1310
1982	1504	1875	1044	584	748	483	1179
1983	1354	1669	981	561	658	411	1065
1984	1164	1401	873	505	586	436	927
1985	861	967	690	374	510	362	686

Table 39. Annual Percentage Change in Estimated Farm Land Values Per Acre, Minnesota, 1946-1985

Years	Percent	Years	Percent
1945-46	16.1	1965-66	7.0
1946-47	10.8	1966-67	6.0
1947-48	9.7	1967-68	8.8
1948-49	5.1	1968-69	5.7
1949-50	2.4	1969-70	1.8
1950-51	16.5	1970-71	2.2
1951-52	8.1	1971-72	6.9
1952-53	-1.9	1972-73	20.2
1953-54	7.6	1973-74	41.9
1954-55	7.1	1974-75	24.1
1955-56	4.1	1975-76	27.0
1956-57	9.5	1976-77	19.0
1957-58	6.5	1977-78	12.0
1958-59	6.8	1978-79	17.0
1959-60	-1.3	1979-80	7.7
1960-61	0.6	1980-81	17.0
1961-62	1.9	1981-82	-10.0
1962-63	1.3	1982-83	-10.0
1963-64	3.1	1983-84	-13.0
1964-65	3.0	1984-85	-26.0

Table 40. Average Price Per Acre of Reported Farm Sales, Standard Deviation and Coefficient of Variation, by District, Minnesota 1961-1985.*

Years	South-east	South-west	West Central	East Central	North-west	North-east	Minnesota
(Average Price Per Acre (Dollars))							
1961	189.1	255.8	130.3	89.0	92.0	37.9	165.2
1962	195.7	228.5	140.5	76.3	73.9	30.3	161.1
1963	214.1	221.9	136.2	86.2	108.8	47.6	168.1
1964	213.3	234.3	150.3	86.3	103.6	51.6	178.1
1965	202.0	232.7	133.2	95.8	106.2	39.7	178.0
1966	253.4	260.4	164.3	113.0	103.4	30.6	203.4
1967	272.4	306.1	178.6	92.9	116.6	51.2	214.8
1968	316.0	329.0	186.0	104.0	90.0	47.0	232.0
1969	340.7	334.1	193.6	129.7	120.8	50.7	238.3
1970	346.0	340.0	206.0	141.0	113.0	45.0	243.0
1971	343.6	343.0	204.5	150.3	100.1	43.7	259.0
1972	389.4	365.7	221.7	145.1	107.2	76.4	293.3
1973	443.5	410.1	223.0	178.1	119.7	121.7	298.4
1974	598.4	630.1	339.8	242.7	204.0	144.4	450.1
1975	791.8	843.9	492.9	298.5	352.8	159.3	607.0
1976	937.2	1115.7	663.7	321.3	377.0	209.7	735.2
1977	1216.0	1340.4	708.6	445.7	431.7	197.9	858.8
1978	1351.7	1320.7	907.6	554.0	504.4	256.3	979.6
1979	1674.6	1679.5	949.3	618.1	612.2	410.9	1139.9
1980	1837.1	1868.2	1095.3	603.0	758.8	394.5	1318.5
1981	1965.3	2004.6	1170.6	680.1	918.7	482.8	1367.1
1982	1748.5	2022.3	1167.9	745.7	886.8	405.7	1359.5
1983	1470.0	1872.0	1068.4	678.5	711.1	327.6	1291.0
1984	1386.1	1665.1	1062.2	644.4	700.0	223.2	1265.6
1985	1012.5	1181.0	872.3	509.6	575.0	189.6	862.4
Standard Deviation							
1961	83.5	71.9	40.0	47.8	54.1	20.1	86.8
1962	80.7	68.6	45.1	39.1	57.2	29.7	88.5
1963	79.4	77.1	50.8	43.7	69.4	26.1	88.6
1964	91.6	77.3	70.1	52.4	89.9	39.0	97.2
1965	96.3	87.0	82.1	63.5	91.1	31.7	98.1
1966	142.7	95.3	56.7	66.5	65.7	32.2	199.4
1967	115.3	106.2	62.8	67.6	85.4	29.8	127.6
1968	179.0	124.2	77.5	108.5	70.5	41.6	160.7
1969	228.6	123.4	64.5	104.2	83.9	45.0	174.0
1970	189.7	129.6	75.4	105.6	89.5	29.3	162.5

Table 40. Average Price Per Acre of Reported Farm Sales, Standard Deviation and Coefficient of Variation, by District, Minnesota 1961-85*(con't)

Years	South-east	South-west	West Central	East Central	North-west	North-east	Minnesota
1971	154.3	128.1	66.6	100.7	66.9	28.9	157.4
1972	154.9	136.4	79.0	96.7	70.0	38.8	164.4
1973	183.3	164.1	94.0	97.2	76.8	86.6	188.9
1974	265.2	290.0	147.2	153.0	127.5	60.6	287.7
1975	291.3	373.8	225.0	142.5	220.8	72.2	360.4
1976	359.0	501.4	243.0	176.2	273.2	100.6	457.8
1977	476.9	606.8	305.2	244.1	294.3	99.4	599.0
1978	454.4	496.9	329.2	304.0	260.9	100.5	539.7
1979	850.3	833.3	361.4	357.2	354.7	228.3	791.6
1980	639.5	746.7	487.2	298.1	337.2	152.9	780.1
1981	675.8	891.3	426.9	624.5	332.2	157.0	826.6
1982	615.9	758.5	423.5	360.8	405.0	127.4	774.3
1983	501.2	593.0	355.4	369.9	293.1	160.5	665.67
1984	452.8	585.6	311.1	334.0	328.4	105.5	586.1
1985	383.8	450.9	350.8	298.6	294.9	122.8	464.9
	Coefficient of Variation (Percent)						
1961	44.2	31.8	30.7	53.7	58.7	53.1	52.6
1962	41.2	30.0	32.2	51.2	77.3	98.0	54.9
1963	37.1	34.8	37.3	40.7	63.8	54.8	52.7
1964	42.9	33.0	46.6	60.8	86.7	75.5	54.6
1965	47.6	37.4	61.6	66.2	85.8	79.8	55.1
1966	56.4	36.7	32.6	58.9	63.8	105.4	58.7
1967	42.3	34.7	35.2	72.8	73.2	58.2	59.4
1968	56.6	37.3	41.6	103.8	78.3	88.5	69.2
1969	67.1	36.9	33.3	80.4	69.5	88.9	73.0
1970	54.8	38.1	36.6	74.9	79.2	65.1	66.9
1971	44.9	37.4	32.6	67.0	66.8	66.1	60.8
1972	39.8	37.3	35.6	66.6	65.3	50.8	56.1
1973	41.3	40.0	42.2	54.6	64.2	71.2	63.3
1974	44.3	46.0	43.3	63.0	62.5	42.0	63.9
1975	36.8	44.3	45.7	47.7	62.6	45.3	59.4
1976	38.3	44.9	36.6	54.8	72.5	48.0	62.3
1977	39.2	45.3	43.1	54.8	68.2	50.2	69.7
1978	33.6	37.6	36.3	54.9	51.7	39.2	55.1
1979	50.8	49.6	38.1	57.8	57.9	55.6	69.4
1980	34.8	40.0	44.5	49.4	44.4	38.8	59.2
1981	34.4	44.5	36.5	91.8	36.2	32.5	60.5
1982	35.2	37.5	36.3	48.4	45.7	31.4	57.0
1983	34.1	31.7	33.3	54.5	41.2	48.9	51.6
1984	32.6	35.3	29.3	51.8	46.9	47.3	46.4
1985	37.9	38.2	40.2	58.6	51.3	64.8	53.9

* Each acre is treated as a unit in calculating standard deviations and coefficients of variation.

NOTES

