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South Dakota Farmland Market Trends - Current and Future Research

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SOUTH DAKOTA FARMLAND MARKET TRENDS-CURRENT AND FUTURE RESEARCH*

by

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INTRODUCTION

Agriculture land market trends are of considerable interest to many people - farm managers landowners, realtors, prospective buyers and sellers of farm real estate, loan officers, agribusiness managers, public officials and the general public.

Interest and concern about farmland market trends intensifies during periods of rapid increases or decreases in land prices. Both of these events have occurred since 1971. For South Dakota, average per acre farmland values increased 345% from 1971 to 1982 ($85 to $291). Since late 1981 and early 1982, farmland prices have steadily declined in most regions of South Dakota - reflecting sharply reduced profits in agriculture and poor prospects for a quick turnaround.

Changing land prices affect the wealth position (farm real estate is over two-thirds of the value of farm business assets) and borrowing capacity of farmland owners. It also affects farm credit policies, farm rental arrangements and public policies concerning property taxes, soil conservation and land use.

Recent farmland price movements lead to several issues concerning land market structure and behavior. For example, what the major characteristics of farmland owners, buyers and sellers and how have these changed over time? What are the relationships between farmland values and rents? How do land prices and other market characteristics differ in various regions of South Dakota? What are the major changes in farmland financing methods and why have they occurred?

What factors explain recent variation in farmland prices in different regions of South Dakota? These issues are examined in current research efforts by the Economics Department at South Dakota State University.

Today, I am: 1) presenting a summary of major findings from current South Dakota farmland market research efforts and, 2) discussing some future directions in farmland market research at South Dakota State University. Major topics are:

(1) Long term farmland market trends in land values, rents and changing characteristics of farmland owners, buyers and sellers

(2) Recent trends (1971-1983) in sale prices and other characteristics of farmland sold in South Dakota

(3) Farmland financing trends

(4) Factors explaining variations in farmland prices based on results from cross-sectional econometric models

(5) Future directions in farmland market research

Information on recent trends was developed from a database of farmland sales provided by the Federal Land Bank of Omaha. A total of 11,635 South Dakota farmland sales (limited to bonafide sales of 40 acres or more) were included in the database of 1971-1983 sales. A subset of 1981-1982 farmland sales from six South Dakota counties used to develop cross-sectional farmland pricing models.

Long-Term Farmland Market Trends

Farmland ownership and tenure has changed substantially in the 20th Century. In the early 1900's most (3/4) South Dakota farms and farmland were owned by farm operators. By 1940 a majority of farmers owned no land, a result of depressed economic conditions in the 1920's and 1930's when over a quarter of South Dakota's farmland went through forecloseure. During the 1940's many farmers were able to regain title to their land.

Since World War II, part ownership has become dominant and the number of nonoperator landlords has increased. Farmers have needed to expand their land holdings while many others (retired farmers and nonfarm investors) wanted to own farmland for investment and other purposes. Farmers continue to own about two-thirds (68% in 1978) of South Dakota's agricultural land while a majority of farmland owners today are landlords. Most nonoperator landlords report off-farm income and many are in a position to absorb short-run fluctuations in agricultural income while waiting for long term gains in farm real estate values. By contrast, off-farm income is only 25-30% of net income received by South Dakota farmers (the lowest proportion of off-farm income in the nation) and a majority of farm operators rely solely on farm earnings. (Janssen-Edelman, 1983).

Approximately two to three percent of South Dakota agricultural land changes ownership each year. Three-fourths of farmland acquired was purchased, primarily from nonrelatives while one-fourth of the farmland acquired was from gifts or inheritance.. Farm and ranchland ownership remain concentrated

in the hands of older people. Roughly one-fourth of South Dakota and U.S. farmland is held by each of four age groups: Less than 45 years old, 45-54 years, 55-64 years and 65 years and overs. (Gustafson, 1983)

Since World War II, farm operators have been the major buyers of farmland while farmers and retired farmers have been the major sellers. In most years, farm operators purchased 70-85% of farmland sold. Farm expansion has become the overwhelming reason for farmland purchases. In most cases, owner-operators have been able to outbid tenants and most non-farm investors.

Farmland values have fluctuated considerably in the 20th Century. Farmland values increased from an average of $39 per acre in 1910 to a peak of $71 in 1920. Values then declined for the next 21 years to a low of $12 per acre in 1941. Farmland values then began an upward trend reaching $40 per acre in 1955 and $85 in 1971 (Figure 1).

Land values accelerated during the export boom period of the 1970's reaching a peak of $291 per acre in early 1982. The annual rate of increase in South Dakota farmland values was 4-5% from 1955-1971 and 12-13% from 1971-1982.

Farmland values and sale prices have steadily declined since early 1982. Based on FLB data mid-1984 farmland sale prices were down about 20% from their peak in late 1981 and early 1982. (USDA estimates of farmland values showed a lower rate of decline-about 10-11% in the same time period) Price

declines were sharpest in the southeast region (down 30-35%) of the State (Janssen, 1984).

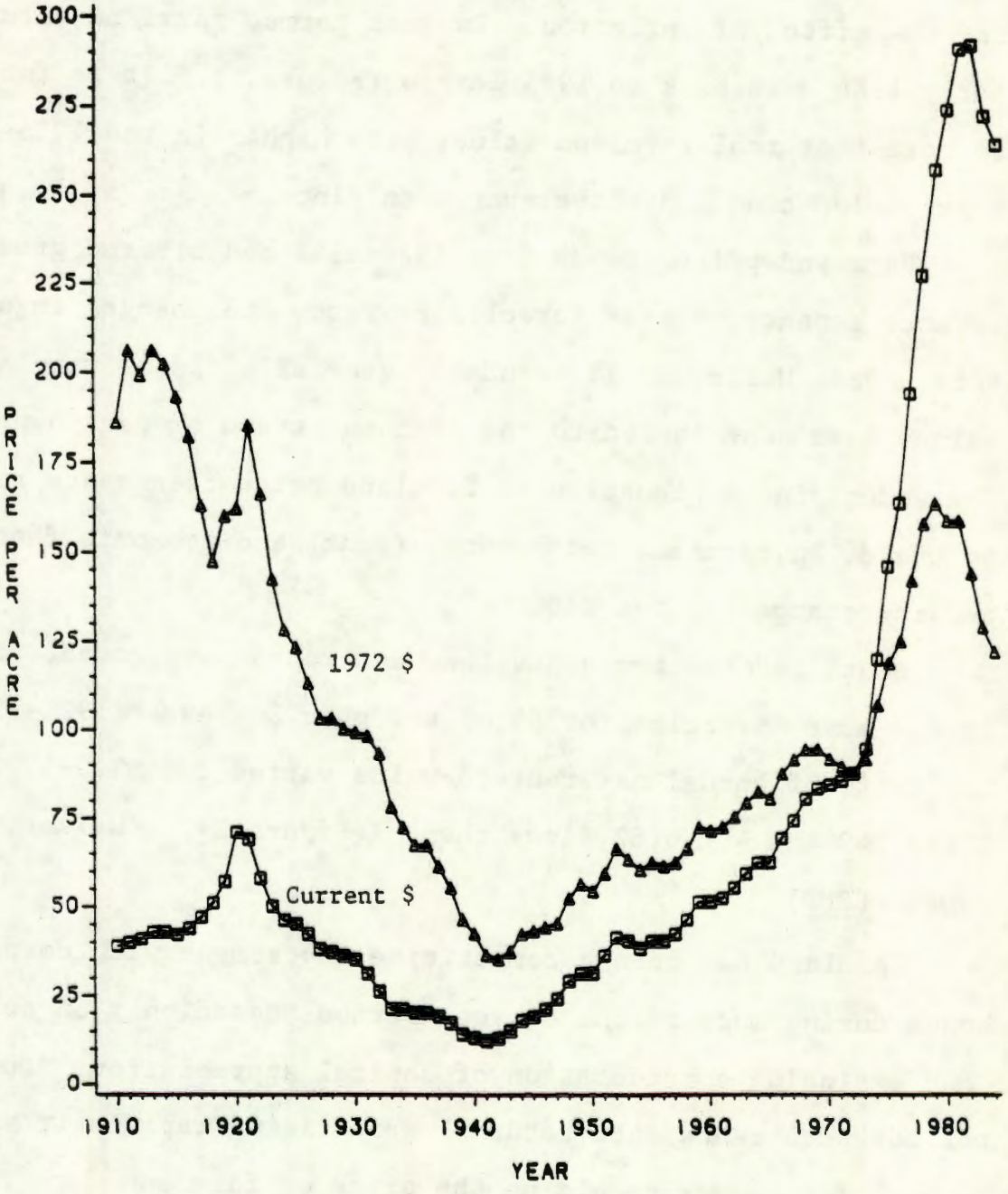
The decline is more dramatic if one views farmland values in terms of real purchasing power - with land values adjusted for the effect of inflation. In real terms, farmland values in early 1984 were back to 1975 levels (Figure 1). It is interesting to note that real farmland values were higher in the 1915-1920 time period than they have ever been since.

Farmland price trends from 1920-1941 contributed greatly to more tenancy, higher foreclosure rates and changes in ownership. Post World War II trends of generally rising farmland values have contributed to the dominant trend of part-ownership. The underlying explanation of farmland price trends are related to trends in farmland net returns (rent) and economic factors causing changes in net returns.

South Dakota farmland values and rents have moved, annually, in the same direction for 55 of the past 64 years (1921-1984). The ratio of annual net rent-to-value varied from 3.0-5.0% from 1921-1949 and 4.1-6.6% since then. (Figure 2). (Walker, 1979; USDA, FREMD)

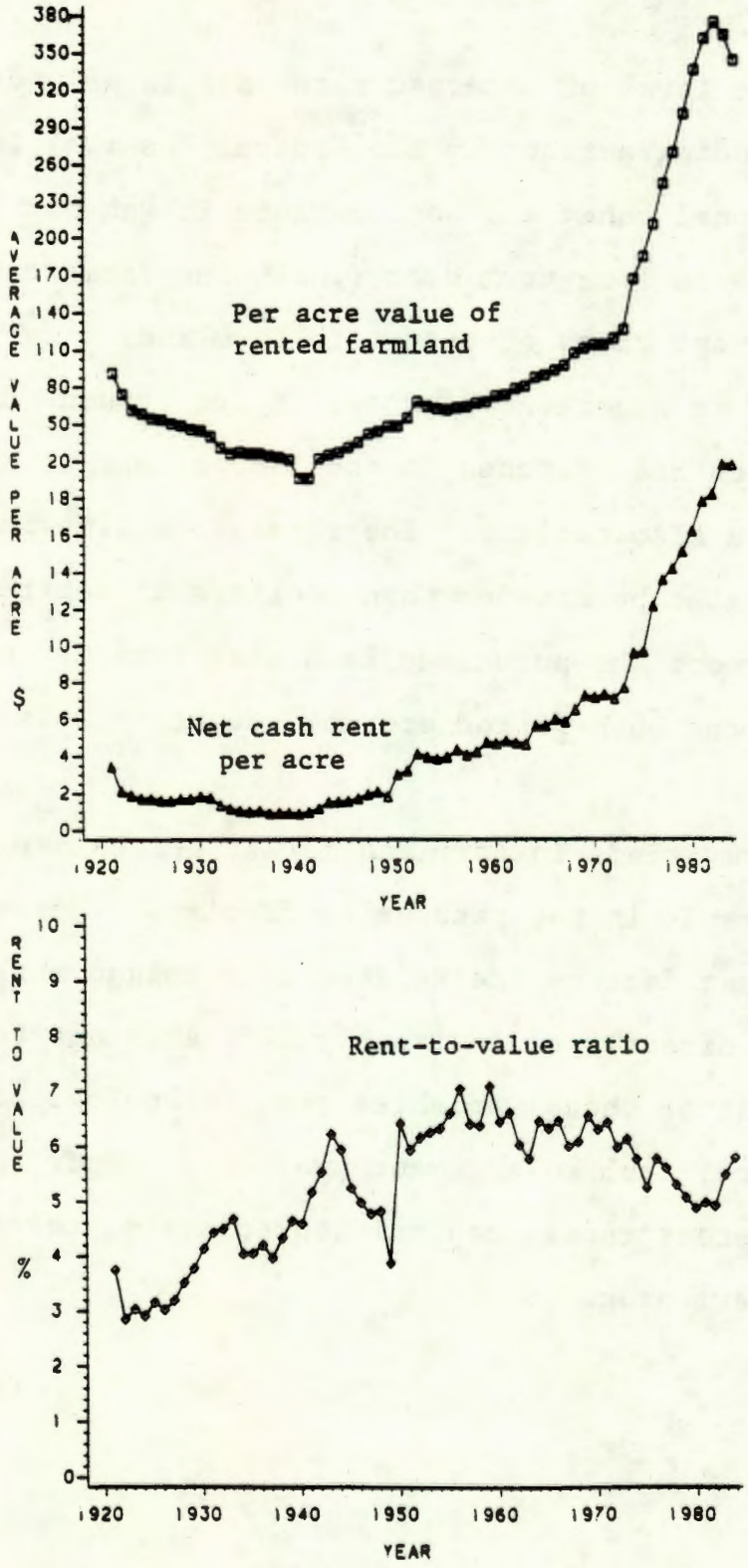
Farmland has been a competitive investment with corporate bonds during much of the 64 year period, based only on net rents and excluding consideration of capital appreciation. During periods when rents (net returns) were rising rapidly it was not unusual for buyers to bid up the price of farmland such that rates of return to farmland, in the year of purchase, were less than rates of return on corporate bonds (a fixed-income long

FIGURE 1. SOUTH DAKOTA FARM REAL ESTATE PRICES, 1910-1984



Source: USDA, Farm Real Estate Market Developments, various issues.

FIGURE 2. SOUTH DAKOTA FARMLAND VALUE AND CASH RENT TRENDS, 1921-1984



term investment). Essentially farmland buyers were competing for the right to obtain expected future increases in land income or net returns with the additional income used to help make the loan payments.

Since the level of interest rates are largely determined by factors (including actions by the Federal Reserve) in the national and international money and bond markets it was not unusual for interest rates on long-term debt (including farm real estate debt) to exceed current rates of return to farmland.

However, if expected increases in net returns did not materialize - which has happened in the 1980's, market prices of farmland would also decline. The rate of decline in market prices would also be steeper than declines in net returns. (Many high-debt farmers who purchased land with borrowed money in the late part of the boom period are now caught in this devastating reversal).

Long term trends in farmland market prices are fundamentally related to trends in net returns to farmland. However several other important factors are related to farmland market prices because they directly or indirectly influence net returns. The most important of these variables are: technological change in agriculture, farm enlargement pressures, export market developments, interest rates, capital appreciation, taxation and government farm programs.

Recent Farmland Market Trends

Major characteristics of over 11,600 farmland sales occurring in South Dakota between 1971-1983 were examined. (Swinson, 1984; Swinson-Janssen, 1985).

The average tract sold contained 366 acres which was almost equally divided between cultivated land and pasture.

The average total sales price per tract increased each year until 1981 when it peaked at about $133,300. The average price per acre increased 4.4 times from 1971 to 1982 when it peaked at $428 per acre. An average annual rate of increase of 14.5% was found.

There were many regional differences in farmland sale tract characteristics. The majority of agricultural land sales occurred in eastern South Dakota, although more acres were sold in central and western South Dakota. Tracts sold in eastern South Dakota averaged 145-224 acres in size while tracts sold in central South Dakota were between 327-477 acres, on average, and tracts sold in western South Dakota averaged more than 1,000 acres.

Eastern South Dakota land sold was predominately cultivated (66-76%) while land sold in western South Dakota was mostly pasture (72-75%). Land sold in central South Dakota was a mixture of cultivated land and pastureland.

Nearly 27% of the tracts sold had building sites on them. Farm houses comprised 52% of reported building values.

Non-agricultural factors influenced the sale price of 5.2% of farmland tracts sold. Residential development was listed as a factor in more than half of these sales.

Irrigation systems were present on 1.8% of farmland tracts sold. Western South Dakota had the highest percent (8.4%) of tracts sold with irrigated land.

The average price per acre also varied greatly by region. Peak regional prices (in 1981-1982) varied from an average of $155-195 per acre in northwestern South Dakota to $900-965 in southeastern South Dakota. Since then, sale prices have dropped in all regions of South Dakota with the largest dollar and percentage decline in the southeast. Most of the per acre price variation across the state can be attributed to differences in land productivity and use.

Farmland Financing Trends

A major structural change in the post World War II farmland market has been greater credit financing. From 1945-1955 only 45-53% of farmland transfers in Northern Plains states were credit financed. Since 1970, 81-94% of farmland transfers were credit financed. The average percent of purchased price borrowed increased from 50-57% to 76-83%.

Sellers and the Federal Land Bank are the principal farm real estate lenders in South Dakota. From 1971-1983 sellers financed 41% of the land sales and the Federal Land Bank financed about 30%. All other lenders (FmHA, commercial banks, insurance companies and

others) were involved in financing another 15% of farmland sales. The rest were 100% equity financed.

The average percent of purchase price financed has also varied by lender over time. The Farmers Home Administration financed a larger percent of the sales price than any other lender, averaging 89%. The Federal Land Bank has, on average, financed 79% or more of the purchase price while sellers have typically financed 75-80% of the purchase price.

Average loan size increased steadily until 1979 and has shown no clear trend since then. Average loan size was $91,800 in 1983 compared to $43,100 in 1971. The annual average size of seller financed loans (and contract for deeds) were always larger than FmHA loans and usually greater than the average size of Federal Land Bank loans.

The annual average rate of interest on credit-financed sales was less than 8% from 1971-1978. Interest rates accelerated to an average rate of 11% in 1982. A slight decline in the average rate of interest charged by each type of lender was noted in 1983.

The lowest average interest rates were reported on FmHA loans from 1971-1978 and on seller financed sales since then. The Federal Land Bank and commercial banks charged about the same rates until 1978 when commercial bank interest rates increased at a faster pace.

The average number of years to repay loans has declined for most lenders during this 13 year period. The FmHA financed sales reported the longest number of years to repay (34.2-39.6).

Average repayment periods on FLB financed sales have slowly declined from 30 years in the early 1970's to an average of 26.9 years in 1983. Seller financed sales averaged repayment periods of 10.4-13.5 years. Sales financed by commercial banks usually had the shortest repayment periods.

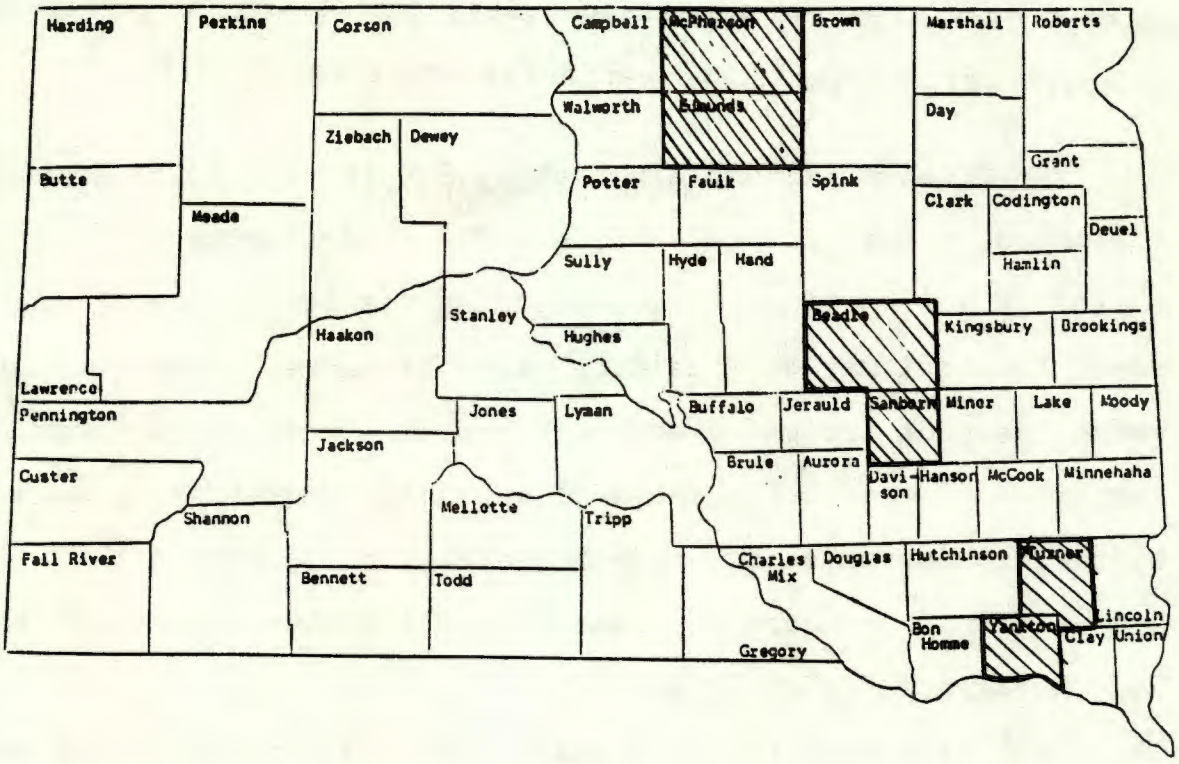
Factors Explaining Variation in Farmland Sale Prices

Farmland price movements have been especially volatile during the past several years. A major objective of this research effort is to determine the significance and impact of factors influencing farmland sales price per acre during this period. Some "case" studies are underway and results from the earliest completed study are summarized here.

A case study completed by Swinson analyzed farmland sales occurring in 1981-1982 in six South Dakota counties (McPherson, Edmunds, Beadle, Sanborn, Turner and Yankton - see Figure 3) (Swinson, 1984). A total of 290 sales were included and transfer prices varied from about $170 to over $2000 per acre. These counties contain much of the variety of agricultural conditions found in central and eastern South Dakota. Western cornbelt, great plains and transition cornbelt-small grain agriculture are included in these counties. Each pair of counties are predominately located in a different land resource area of South Dakota-insuring variation in land use and quality.

Data provided by the Federal Land Bank of Omaha was supplemented with information from local Federal Land Bank Associations, county courthouses and sale tract soil productivity data, developed by the Soil Conservation Service and SDSU Plant Science Department (Malo and Westin, 1978).

Figure 3. Location of Six South Dakota Counties Selected.



Multiple regression procedures were used to develop econometric models to explain variation in per acre sale prices (the dependent variable). Four general types of independent variables were used in the model:

1) Land tract characteristics - average soil productivity rating, variation in soil productivity, total acres purchased, percent of tract cultivated, percent of tract irrigated, building value per acre, distance to local market (town) and to regional market (city), principal products, road surface (paved, gravel, dirt) adjacent to sale tract, nonfarm influence

2) Financial variables - interest rate, repayment period (years), percent of purchase price borrowed, percent of purchase price seller received upon settlement and primary lender

3) Buyer-seller characteristics - major reason for purchase, major reason for sale and method of sale (auction, private, etc.)

4) Other - month of sale and regional location.

Several alternative equations were specified. Final results from a stepwise regression model containing coefficients of statiscally significant variables are shown in Table 1.

The final model explained about 84% (R^2 = 0.8375) of the variation in per acre sale price. The coefficients for the variables of soil productivity (including the squared term), distance to local market, building value per acre, percent cultivated, percent irrigated and month of sale were significant. Also significant were coefficients of variables representing sales to realize appreciation, private sales, southeast region and principal products of wheat or small grains. All coefficients had the expected sign. (Table 1)

Soil productivity, in relative percentage terms, has a strong, but nonlinear, relationship to per acre sale price. As expected, cropland and/or irrigated land use substantially adds to sale price. A slight premium is paid for sale tracts located close to town. Buildings add about 72¢ per $1 of value estimated by FLB loan officers. Farmland typically used to produce wheat and small grain has lower value than land used to raise corn and soybeans.

Perhaps as important was the finding that all financial variables and most buyer-seller variables were not significant factors in explaining per acre sale price. The traditional explanation of per acre price variation reflecting differences in soil productivity, land use and location characteristics are largely confirmed.

Table 1. Factors explaining variation in per acre sale price, 1981-82.

Parameter[a]	Parameter Estimate	Standard Error	Prob. Level of Significance
Intercept	1101.2000	187.2320	.0001
SPR	-31.3255	6.3428	.0001
SPRSQ	0.3171	0.0527	.0001
LMKT	-7.0683	1.4661	.0001
BVPA	0.7251	0.1051	.0001
SRA	52.6013	28.9253	.0701
SMP	61.2729	19.8938	.0023
PCTCULT	1.9921	0.3861	.0001
PCTIRR	6.9391	0.9229	.0001
MOS	-5.6766	1.4373	.0001
PGRAIN	-58.6736	25.1023	.0201
REG3	385.2010	37.0687	.0001

R^2 = .8435 Dep. Mean = 623.4690
R^2 = .8375 C.V. = 25.8156
Prob F = .0001

a
Parameters listed by order of entry.

b
List of independent variables:

SPR = soil productivity rating
SPRSQ = soil productivity rating squared
LMKT - distance to local market
BVPA = building value per acre
SRA = sale reason-realize appreciation
SMP = sale method-private
PCTCULT = percent of tract cultivated
PCTIRR = percent of tract irrigated
MØS = month of sale (1 = Jan, 1981; 24 = Dec. 1982)
PGRAIN = wheat and small grains are principal products.
REG3 = southeast region

Future Directions in Farmland Market Research

Present farmland market research efforts have been underway at the SDSU Economics Department for about two years. During the previous 25 years, the Economics Department had conducted only occasional farmland market studies.

Several Economic Departments at Land Grant Universities in surrounding states (Iowa, Minnesota, Nebraska and North Dakota) have maintained state farmland market research programs for many years. Annual reports monitoring farmland market developments in different regions of each state are published along with occasional more specialized studies. Detail farmland market survey data provided by farm managers, appraisers, realtors and ag lenders are the major sources of information in these states. The University of Nebraska also uses information from the Federal Land Bank of Omaha to supplement their own farmland survey findings. (Johnson-Hanson, 1984)

The Federal Land Bank database of farmland sales transactions is a very useful source of primary information about farmland markets. Research efforts at SDSU concentrated on using and augmenting this database. It is more comprehensive than other existing sources of farmland market data.

Development of an annual farmland market survey is one option for continuted research at SDSU. However, start up costs in terms of professional time and budget are fairly high. Thereafter, annual costs would be much lower but the data series would need to be continuously maintained to be useful. Support of farm managers, appraisers, ag lenders and related groups would need to be developed and maintained.

Three levels of studies are usually conducted in a well-developed research program on farmland markets:

(1) Annual monitoring of land market developments in the state and region

(2) Special studies of farmland market segments

(3) Economic modelling of farmland markets

Annual reports on farmland market developments are the "bread and butter" program designed to reach the general audience. Publication of newsletters and short articles along with radio and TV spots are emphasized in this program. This approach has considerable interest and appeal to many audiences but, by itself, does not generate more in-depth knowledge about the performance and functions of land markets.

Special studies of farmland market segments are one approach to acquire more in-depth knowledge. These studies provide detailed information and explanation of market developments in a specific segment of the farmland "markets." These studies are usually published in bulletins and research reports (Smith and Raup, 1983). One feature of these studies are that they only need periodic updating.

An example of a special study underway is a detailed analysis of characteristics of farmland transfers from 1971-1983 in selected regions of South Dakota. Also under discussion is a possible benchwork study of cropland and pasture-land rental arrangements in different regions of South Dakota. (The last benchmark farm rental study was conducted in the 1960's) Results from this type of study would increase our overall understanding of farmland markets in South Dakota and also provide information of interest to the general public.

Economic modelling of farmland markets provides information on the relative importance of various factors influencing farmland sale prices (or other characteristics) over time or in specific time periods. It is the only approach that can "test" alternative explanations of farmland market behavior. Results are generally published for professional audiences in journals and research reports with shorter, less technical articles written for general audiences. The 1981-82 case study reported in this paper is an example of this approach.

Concluding Remarks

The study of farmland markets is important for several reasons. Farmland is the major component of the wealth base in agriculture. Changing land values have major impacts on the economic health of agriculture. Longterm changes in farmland ownership and the competitive positions of various groups of buyers and sellers can signal future changes in the organization of agriculture.

Major changes have occurred in 20th century South Dakota farmland values with accompanying changes in ownership, tenure and selected characteristics of buyers and sellers. In the midst of massive changes, certain factors have remained the same.

First, farm operators have almost always been the major owners, buyers and sellers of farmland.

Second, farmland market values are derived from net returns (rents) and expected net returns. Rents and market values generally move together. What has changed is the growing impact

of international commodity and financial markets on the level of net returns and expected returns. In this sense U.S. and South Dakota farmland markets are more responsive to worldwide economic conditions than they were in the 1950's-early 1970's.

Third, productivity, land use and location factors seem to explain most of the variation in per acre farmland sales prices. This finding conforms with traditional explanations of land price differences at a point in time.

A comprehensive approach to state farmland market research would involve 1) annual monitoring of farmland market developments, 2) special studies of farmland market segments and 3) economic modeling of farmland markets. Close cooperation of Universities, farm managers and appraisers, agricultural lenders and related groups would be needed to pursue this approach.

Thank you very much for your time and attention. Your suggestions and comments will be greatly appreciated.

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