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Farmland Values as an Indicator of Regional Economic Performance?

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Real values per acre of farmland show that California's agricultural sector has performed better economically than sectors in other leading agricultural states. Nevertheless, urban influences on farmland values are a national phenomena that make it difficult to evaluate local agricultural competitiveness.

Also in this issue

Marketing a Mediterranean Diet: Some Issues and Opportunities
Hoy F. Carman 5

Brand Loyalty and Gasoline Pricing in Sacramento
Jennifer R. Thompson 9

Traditional farmland valuation theory's presumption of a direct link between production income and farmland values means that those values should serve as an indicator of economic performance for a geographic area. Unfortunately, one shortcoming of relying on the traditional theory is that it can lead analysts to overstate the competitiveness of agriculture in states or local areas. For example, it is easy to misinterpret recent increases in farm real estate values as evidence of strong profitability (which is an indicator of competitiveness) in the production agriculture sector because (according to the traditional theory) "in rural areas, agricultural land values are primarily determined by the income earning potential of the land, as measured by expected returns from crops and livestock" (USDA 2000). However, as the following discussion illustrates, a more detailed assessment of the facts related to farmland values across locations gives a much different outlook.

The fact that average farmland values across the United States have risen for two decades masks the fact that long-run performance of farmland values tells a different story for specific locations. Also, recent changes in the markets for farm real estate and the implications of those changes are often overlooked when assessing local agricultural competitiveness. Therefore, to provide a long-run perspective illustrating the need for a modified view of farmland values as an indicator of competitiveness, the next section presents farmland value data for the past three decades and a summary of the U.S. Department of Agriculture's (USDA's) explanation for the recent increases. Then, a simple analysis shows what types of new factors need to be added to valuation theory to make farmland values a better economic indicator.

The Data, Nominal and Real

To begin, Table 1 presents farm real estate average values per acre in nominal and real dollars for the period of 1980 to 2006, as reported by the USDA. Data are presented for the entire United States, plus separate values for the three states with the highest levels of agricultural sales revenue: California, Texas, and Iowa. The farmland nominal value levels in the four columns on the left are quite different, but in each case the effects of the "farm crisis" of the 1980s is apparent. Values peak in some years during the early/mid-1980s, fall for a few years, and then begin a recovery. Farm real estate values had increased rapidly in the decade prior to the "farm crisis," but the changes in lending practices that followed the crisis were supposed to have reestablished the fundamental link between land values and local commodity market performance across the United States. Variation between the aggregate national values and the values in each of the states calls for a closer look.

For the United States, the nominal price peak of $823 per acre occurred in 1982, the bottom was in 1987, and the recovery was completed in 1995 when values rose above the level of the earlier peak. The recovery was even slower if real values are considered instead of nominal values. Using the Consumer Price Index to convert the average farmland values into *real* terms (in 2006 dollars) gives an early peak of $1,603 per acre in 1981 and a low of $947 in 1987. Thus, the real data show that the decline was steeper than indicated by the nominal data: there was a 41 percent drop in real values and a 23 percent drop in nominal values. Also, the U.S. farmland market, on average, did not completely recover until 2005 when real values passed the early peak of $1,603. In other words, farmland values are now about the same as they were a generation ago. So, in real purchasing power terms, farmers' wealth has not increased over that period.

For the three leading agricultural states, very different pictures emerge from the data in Table 1, indicating that Midwestern agriculture has not completely recovered from the farm crisis of the 1980s, whereas California has done well. In nominal dollars, California farm real estate peaked later and recovered sooner (in 1984 and 1991, respectively) than did the national average values. Texas farm real estate values peaked at $694 in 1985 and, after their 1992 bottom, finally rebounded by 2001. In Iowa, nominal farm real estate values peaked at $1,999 in 1981, hit bottom in 1987, and appeared to recover by 2003. However, these values do not reflect the effects of inflation. The real performance of farm real estate in the three states was worse, and it shows the differences in demand for farmland in the three different regions. California's average values recovered to the "pre-crisis" level by 2001, and in 2006 *real* values were about 54 percent above their earlier peak (reached in 1982). Texas farm real estate did not recover to its 1985 peak until 2006, when it was just nine percent above the previous high. Iowa still has not recovered in real terms. Iowa's average value in 2006 was only 74 percent of the real 1980 value. Clearly, the economic performance of the three state agricultural industries has varied over the last three decades, with California doing the best.

Table 1. Farm Real Estate Average Values, 1980–2006 ($/acre)

Year	Nominal Value				Real Value (base=2006)			
	United States	CA	Texas	Iowa	United States	CA	Texas	Iowa
1980	737	1,424	436	1,840	1,578	3,049	933	3,939
1981	819	1,732	468	1,999	1,603	3,390	916	3,912
1982	823	1,900	539	1,889	1,518	3,505	994	3,484
1983	788	1,918	544	1,684	1,398	3,404	965	2,989
1984	801	1,981	612	1,518	1,370	3,388	1,047	2,596
1985	713	1,841	694	1,091	1,183	3,056	1,152	1,811
1986	640	1,730	594	873	1,039	2,809	965	1,418
1987	599	1,554	546	786	947	2,457	863	1,243
1988	632	1,575	544	947	966	2,408	832	1,448
1989	668	1,742	521	1,095	984	2,566	767	1,613
1990	683	1,884	507	1,090	969	2,672	719	1,546
1991	703	2,077	498	1,139	963	2,846	682	1,561
1992	713	2,157	488	1,153	955	2,889	654	1,544
1993	736	2,213	499	1,212	964	2,897	653	1,587
1994	798	2,210	515	1,280	1,023	2,833	660	1,641
1995	844	2,220	525	1,350	1,060	2,789	660	1,696
1996	887	2,400	540	1,450	1,094	2,959	666	1,788
1997	926	2,500	554	1,600	1,123	3,032	672	1,940
1998	974	2,610	593	1,700	1,168	3,130	711	2,039
1999	1,030	2,800	640	1,760	1,218	3,310	757	2,081
2000	1,090	3,000	680	1,800	1,261	3,471	787	2,083
2001	1,150	3,200	730	1,850	1,299	3,616	825	2,090
2002	1,210	3,400	775	1,920	1,344	3,776	861	2,132
2003	1,270	3,600	810	2,010	1,381	3,915	881	2,186
2004	1,360	3,800	855	2,200	1,438	4,018	904	2,326
2005	1,650	5,090	1,030	2,650	1,693	5,224	1,057	2,720
2006	1,900	5,390	1,250	2,930	1,900	5,390	1,250	2,930

Source: "Land Values" spreadsheets on the Webpages of the Economic Research Service, USDA.

Agricultural income generally has not been strong over the last three decades, so what has been pushing up farmland values in recent years? One answer was provided by the USDA:

> "Although average agricultural land values nationally are determined primarily by the income earning potential of the land, nonagricultural factors appear to be playing an important role in many local areas. To some extent, the buoying effect of these nonagricultural factors on agricultural land values could be partially offsetting the effect of lower returns from agricultural production."

What the USDA report called "urban influence" affects only about 17 percent of U.S. farm acreage. The USDA classifies only 515 counties in the United States as being both completely rural (containing no part of a city with at least 2,500 residents) and not adjacent to a metro area. In all remaining counties, the USDA says there is some degree of urban influence on land values. Urban influence has a significant impact on farmland values. The USDA estimated that during 1994–1996 the average value of farmland that was not urban-influenced was $640 per acre, compared to $1,880 for urban-influenced farmland. Thus, USDA concluded that 66 percent of urban-influenced farmland market value was due to nonagricultural factors.

> "The market value for undeveloped farmland in these areas often begins to rise above its value based on agricultural returns alone, reflecting anticipation of eventual nonagricultural uses."

That explains why Rhode Island had the nation's highest average farm real estate value during 2006 at $12,500 per acre. In densely populated areas along the East and West Coasts, the amount of urban influence on farmland values can be extreme. For example, in 2001 a 35-acre parcel of farmland in California's Ventura County was valued at about $300,000 per acre, due almost entirely to its development potential. Such examples can skew the distribution of farmland values within a state and quickly raise the average.

The USDA study results offer two factors as partial explanations for the differences in farmland values observed for the three leading agricultural states. First is the potential profitability of the crops that can be grown on a parcel of land, which is the traditional theory. Second is the potential for nonagricultural uses of a parcel, which is one of the most significant sources of "adjustments" that need to be made to values derived from the traditional theory. For California, the prospects for both factors are better than are the prospects for Texas and Iowa, so farmland values are higher in the Golden State and have made a stronger recovery relative to values observed before the farm crisis of the 1980s.

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So, in the cases of these three states, farmland values generally do serve as an agricultural economic barometer, although the traditional theory of prices is clearly incomplete because it cannot account for the confounding effects of the modern factors requiring "adjustments" to traditional price estimates. Part of the problem is that there has never been an exhaustive evaluation of the many factors that influence farmland values. Such a task may be impossible because each location will have a unique list of factors, but some general categories of factors are beginning to emerge in the literature.

The Relative Importance of Pricing Factors

In addition to the two factors discussed in the USDA report, two others—policy effects and amenity values—may contribute to farmland values according to a growing new literature. There is now little debate remaining about whether agricultural policies influence farmland values as even the government acknowledges that there is an influence (see, for example, USDA 2001). However, many questions remain about the nature, extent, and direction of the influence. It is easy to see that government policies aimed at increasing returns from farming activities would affect farmland values, yet other policies, such as land use restrictions, are less obvious in their effects. The effects of amenities on land values are parcel-specific and can be measured only with individual sales data, thus much less empirical research was done on this subject until recently. As sales data began to become available, studies like that by Torell et al. began to show that "lifestyle amenities" (such as a desirable location and recreational opportunities) explained much more of rural land value than did the productivity of the land in many areas. The range of amenities and the scale of their effects on prices are often surprising.

Thus, the story will differ by location, but the message is the same; there are four categories of influence on farmland values. The first of these categories, agricultural productivity, is the basis of the traditional theory of valuation. The other three categories are types of "adjustments" to the traditional value.

The discussion above implies that farmland valuation has become much more complicated in the last couple decades. An increasing number of factors have been shown to influence farmland values, thus adding to the list of necessary "adjustments" to the traditional model. A recent study by Huang et al. illustrates how involved price analysis has become. They estimated a model of Illinois farmland values using county-level, cross-section time-series data. Explanatory variables included land productivity, parcel size, improvements, distances to Chicago and other large cities, an urban-rural index, livestock production (using swine operation scale and farm density measures), population density, income, and inflation. They concluded that farmland values per acre decline with parcel size, ruralness, distance to Chicago and large cities, and swine farm density and increase with soil productivity,

Table 2. Estimation Results for Farmland Value Equations by Region, 1996–2004

Variable	Northeast	Lake States	Corn Belt	Appalachia	Southeast	Delta	Southern Plains	Northern Plains	Mountain	Pacific
Revenue Per Acre	0.155	-0.020	0.221*	0.012	0.018	0.152*	–0.057	0.298	4.139	0.083
Gov't Payments	–7.184	3.535	33.272	4.378	0.714	–2.455*	–7.007*	1.243	–3.934	0.473
Cost Capital	–0.156*	–0.001	–0.027*	–0.004	–0.028	–0.008	0.006	–0.008	–0.082	0.054
Productivity	0.037	0.035	–0.052	0.030	0.188*	–0.146*	0.067	-0.230	-3.997	-0.058
Population Density	0.007*	0.004*	0.005*	0.008*	0.009*	0.005*	0.004*	0.008*	0.032*	0.028*

The value in each cell is the variable's regression coefficient. ** denotes statistical significance at the 90% confidence level.*

population density, and personal income. Clearly, valuation models are changing!

With so many factors to be considered in modeling farmland values, a natural question arises: which one(s) is (are) the most important in today's market? To answer that question, a simple analysis was conducted. Farm-level survey data from across the continental United States were used to estimate simple equations for farmland values over the 1996–2004 period. To begin, a single equation for the average farmland value was estimated for each of the ten geographic regions of the country. The explanatory variables included were proxies for three of the four categories of influence on farmland values. Productivity of the land was proxied by two variables: revenue per acre and a productivity index. Urban influence was proxied by a county population density measure. Policy effects were proxied by the amount of government payments received per acre. Amenity effects are specific to individual parcels, thus they cannot be estimated using aggregated data and were, therefore, excluded from this analysis. One additional explanatory variable was included: the cost of capital was used to represent the financial factors in a market.

The empirical results of the statistical analysis for each of the ten regions are presented in Table 2. The key result is that the proxy variable for the non-farm demand for farmland—county population density by year—was significant in all regions (meaning there was a 90 percent or better probability that the variable's effect was greater than zero). This is consistent with the growing realization that non-farm demand for farmland is increasingly influencing farmland values, even in areas such as the Corn Belt and Northern Plains where economies were dominated by production agriculture in the last century. The population density variable swamped the effects of the four other variables, meaning that population was much more often significant across the ten regional equations. This result is consistent with the USDA's results, which showed a dramatic increase in farmland value when a parcel was in an urban- influenced area. Thus, the proximity of a farmland parcel relative to nonagricultural development is a key factor in pricing. This implies that no commodity can generate enough revenue to adequately compete with expanding urban development, meaning that land-use ordinances may be needed to preserve farmland in urbanizing areas.

In summary, the traditional theory that farmland values are influenced primarily by the land's ability to generate profits from agricultural production may still be true for some farms in some locations, but for all regions urban influence is the dominant factor in the valuation process. This change in American farmland markets has been caused by the evolution of the national economy. It signals that economic development is ongoing and more change is coming, all making farmland values more of an indicator of *general* economic performance and less an indicator of agricultural competitiveness.

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For more information, the author recommends the following:

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