Chapter 4
IOWA LAND VALUATION

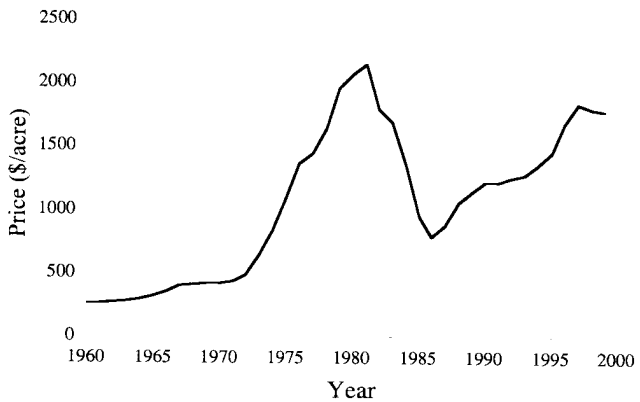
By Sergio Lence

Land constitutes a major asset for the economy as a whole. The value of the farm real estate in Iowa in 1997 was estimated by the U.S. Department of Agriculture to be $51.5 billion. For the agricultural sector in particular, the importance of farmland is paramount. First, land provides an essential factor of production. Second, land serves as a store of value. Between 1960 and 1998, farmland accounted for a low of 65 percent to a high of 81 percent of all Iowa's farm assets. Third, the amount of financing available to the agricultural sector is linked to the value of land, since land is the main source of collateral.

Land also is important for the economic performance of non-agricultural sectors. This is true because of both indirect and direct effects. The indirect effects consist of the spillovers from the agricultural sector to the rest of the economy. The direct effects arise, for example, from the rents accruing to non-operator landlords and from the revenues of taxes levied on farmland. Neither of the latter are to be neglected, since about 61.4 percent of Iowa farmland owners were non-operator landlords in 1997, and the state of Iowa collected about $523 million from farm property taxes in 1997.

Unfortunately, farmland prices have experienced notorious boom-bust cycles. Figure 1 displays the nominal prices of Iowa farmland over the most recent boom-bust cycle. Land prices grew for 20 consecutive years from 1961 through 1981, for a total cumulative gain of 720 percent. After peaking in 1981, prices fell by almost two-thirds in just five years. Prices then increased in each of the following 11 years. There was another major boom-bust cycle in Iowa farmland values in the early 1900s. Iowa farmland prices rose in every year from 1900 through 1920, for a total cumulative increase of 480 percent during the boom period. Subsequently, land prices fell in every year from 1920 through 1933. In 1933, prices were only about one-fourth of the peak level of 1920.

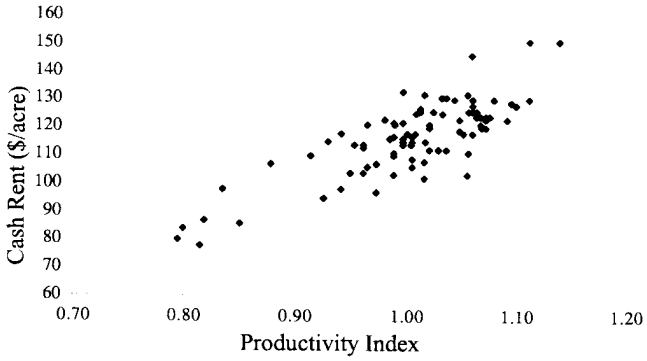
Figure 1. Iowa Farmland Prices, 1960-1999 ($/acre)



Determinants of Farmland Values

Farmland is a unique good in various respects. First, farmland may be used as a factor of production for agricultural activities. Hence, there exists a demand for farmland derived from its use as a factor of production. This point is illustrated in Figure 2, which shows that the 1999 farmland rental rates in Iowa counties were strongly related to the respective counties' suitability to grow corn and soybeans, as measured by a productivity index.

Figure 2. Relationship Between 1999 Cash Rents and Productivity Index for Iowa Counties

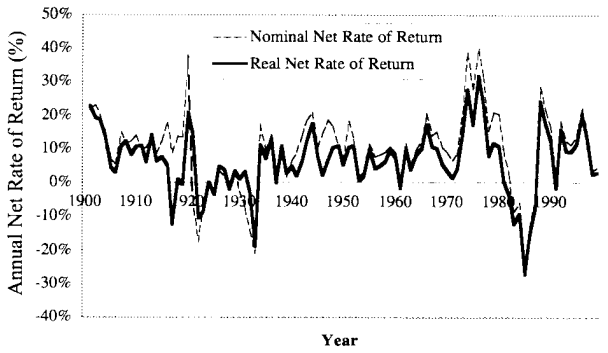


Second, farmland may be used to satisfy human wants directly. Examples of this usage of land are summer homes, parks, recreational sites and rural residences. So some of the demand for land is related to its attributes as a consumption good, rather than as a factor of production.

Finally, farmland is durable, as it can be used in more than a single production and/or consumption cycle. In fact, farmland may be considered an infinitely-lived good. Due to farmland's long life, there is a demand for it stemming from its asset-like characteristics, because farmland may be used as both a store of value and a source of current income and/or consumption.

A look at the net rate of return to an investment in farmland provides a rough assessment of the historical performance of farmland as an asset. The behavior of the net rate of return to Iowa farmland over the past century is depicted in Figure 3, both in nominal as well as in real terms. On average, the nominal net rate of return was 10 percent per year from 1901 through 1999. In real terms (i.e., after accounting for inflation), the annual net rate of return averaged 6.7 percent over the same period.

Figure 3. Annual Net Rate of Return to Iowa Farmland, 1901-1999.



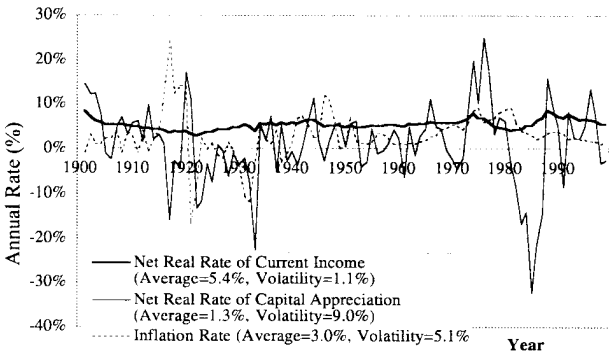
The net rate of return to Iowa farmland has been quite volatile, whether expressed in real or nominal terms. Further insights into the causes of the volatility can be gained by partitioning the net rate of return into its different components. The nominal net rate of return to farmland may be conceptually decomposed as follows:

Nominal Net Rate of Return = Net Real Rate of Capital Appreciation + Net Real Rate of Current Income and/or Consumption + Inflation Rate.

The "Net Real Rate of Capital Appreciation" denotes the rate of gain in the value of farmland in real terms. The "Net Real Rate of Current Income and/or Consumption" is the income and/or benefit accruing to the holder of land for its use as a productive asset, also in real terms. Finally, "Inflation Rate" captures the rate of return arising from the nominal gains in farmland values due solely to inflation.

Figure 4 depicts the realized annual values of each of the conceptual components of the nominal net rate of return to Iowa farmland from 1901 through 1999.

Figure 4. Annual Inflation Rate and Annual Net Real Rate of Capital Appreciation and Current Income Corresponding to Iowa Farmland, 1901-1999.



Over the last century, the "Net Real Rate of Current Income" was both the largest and the most stable of the components of the nominal rate of return to Iowa farmland. In stark contrast, the "Net Real Rate of Capital Appreciation" was the smallest and the most volatile constituent of Iowa farmland's nominal rate of return. The differences between them are quite large, as the average "Net Real Rate of Current Income" was more than four times larger than the average "Net Real Rate of Capital Appreciation," and the volatility of the latter was more than eight times greater than the volatility of the former.

The most likely explanation for the high volatility of the "Net Real Rate of Capital Appreciation" is that this component consists of the capitalization of the income stream accruing to farmland for all of its future (infinite) life. Therefore, seemingly negligible changes in the expected real income stream or in the real rate at which the future is discounted have the potential to greatly affect the "Net Real Rate of Capital Appreciation."

The correlation between the "Net Real Rate of Capital Appreciation" and the inflation rate should be zero if farmland provided a perfect hedge against inflation, and minus one in the opposite situation of farmland providing no hedge against inflation whatsoever. The actual correlation between the "Net Real Rate of Capital Appreciation" and the inflation rate over the 1901-1999 time period was essentially zero, which is consistent with the view that hedging against inflation could have been a motive behind investments in Iowa farmland.

The preceding analysis suggests that, over the last century, the performance of Iowa farmland as an investment was significantly better at providing a stable net real rate of current income than as a means of storing wealth with little risk. Investments in Iowa farmland also seem to have provided an effective hedge against inflation.

Implications for Farmland Prices

The previous analysis has some implications for the value of Iowa farmland over the past century. The most important are:

- In nominal terms, Iowa farmland values tended to follow the price level prevailing in the economy as a whole.
- In real terms, the value of Iowa farmland tracked the behavior of the real rental rate of farmland.
- In real terms, the value of Iowa farmland often deviated from the corresponding real rental rate. This is an implication of the volatile behavior of the "Net Real Rate of Capital Appreciation." The deviations of the real value of Iowa farmland from the real rental rate may be attributed to changes in the expected future stream of real rental rates and/or in the real rate at which the future was being discounted.

If the value of Iowa farmland continues to behave in the future as it has in the past, it may be concluded that, in nominal terms, it will keep up with inflation. Further, the real value of Iowa farmland will track the real rental rate of farmland. However, important deviations may be observed from time to time, due to changes in the expected future stream of real rental rates and/or in the real discount rate. For investment purposes, Iowa farmland is likely to yield a stable net real rate of current income and to provide an effective hedge against inflation.