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**STAFF PAPER P89-52** **DECEMBER 1989**

## Some Lessons From Land Price Booms and Busts

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## I. Introduction

I am inviting you to visit with me what one writer has called that darkest of dark ages, the day before yesterday. We have just passed through one of the most severe periods of boom and bust in farmland prices in our history. We are still too close to the experience to permit a balanced interpretation of what happened, and why. But it does seem appropriate to distill some tentative lessons from these traumatic events, and ask ourselves what we have learned that may be useful in the future. The discussion to follow will focus on the Midwest since that is the region in which the amplitude of the boom and bust was greatest, and it is also the region for which historical data are most reliable.

## II. A Brief Look at the Scale of the Boom and the Bust

The differential magnitudes of the boom phase from 1972 to 1981 in The Corn Belt, Lake States, and Northern Plains are shown in Table 1. In this period farmland values increased approximately five-fold in Minnesota and Iowa, and four-fold or more in all of the other leading Corn Belt states. The smaller increases were in Missouri, Kansas, South Dakota, and Michigan.

In the bust phase, which ran from 1981 to 1987 in all Corn Belt and Lake States, the collapse of values was an approximate reverse image of

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Table 1

Percentage Increase in Value Per Acre of Farm Land and Buildings
March 1, 1972 to Peak, February 1, 1981
in U.S. Corn Belt, Northern Plains and Lake States[a]

| State | Average Value Per Acre, Land and Buildings | | Percent Increase Peak/1972 |
|---|---|---|---|
| | 1972 | Peak in 1981 or 1982 | |
| | Dollars | | Percent |
| Minnesota | 241 | 1,281 | 531.5 |
| Iowa | 414 | 1,999 | 482.8 |
| Indiana | 435 | 2,031 | 466.9 |
| North Dakota | 98 | 455[b] | 464.3 |
| Nebraska | 170 | 730[b] | 429.4 |
| Wisconsin | 274 | 1,152 | 420.4 |
| Illinois | 522 | 2,188 | 419.2 |
| Ohio | 439 | 1,831 | 417.1 |
| South Dakota | 87 | 349[b] | 401.1 |
| Missouri | 261 | 990 | 379.3 |
| Kansas | 174 | 628[b] | 360.9 |
| Michigan | 370 | 1,289 | 348.4 |

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a U.S. Dept. of Agriculture, ERS, Farm Real Estate Market Developments, CD-83, July 1978, and Agricultural Resources, Agricultural Land Values and Markets, Situation and Outlook Report, AR-6, July 1987, p. 8.

b Peak values were in 1981 for all Corn Belt and Lake States, but 1982 for all Northern Plains States, (N. Dakota, S. Dakota, Nebraska, Kansas).

Table 2

**Relative Decline in Average Value of Farm Land Per Acre From Peak to 1987 in U.S. Corn Belt, Northern Plains and Lake States[a]**

| State | Price Per Acre: Average at Peak[b] | Price Per Acre: Average 1987 | 1987/ Peak | Percent of Peak Value Lost to 1987 |
|---|---|---|---|---|
| | Dollars Per Acre | | % | % |
| Iowa | 1,999 | 748 | 37.4 | 62.6 |
| Minnesota | 1,281 | 493 | 38.5 | 61.5 |
| Indiana | 2,031 | 931 | 45.8 | 54.2 |
| Nebraska | 730 | 335 | 45.9 | 54.1 |
| Illinois | 2,188 | 1,040 | 47.5 | 52.5 |
| South Dakota | 349 | 178 | 51.0 | 49.0 |
| Ohio | 1,831 | 942 | 51.4 | 48.6 |
| Kansas | 628 | 340 | 54.1 | 45.9 |
| Wisconsin | 1,152 | 626 | 54.3 | 45.7 |
| Missouri | 990 | 552 | 55.8 | 44.2 |
| North Dakota | 455 | 282 | 62.0 | 38.0 |
| Michigan | 1,289 | 833 | 64.6 | 35.4 |

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a U.S. Dept. of Agriculture, Economic Research Service, Agricultural Resources, Agricultural Land Values and Markets, Situation and Outlook Report, AR-6, July 1987, p. 8.

b Peak values were in 1981 for all Corn Belt and Lake States, but 1982 for all Northern Plains States, (N. Dakota, S. Dakota, Nebraska, Kansas).

the boom, as shown in Table 2. The greatest declines were in Iowa and Minnesota, where over sixty percent of peak values were wiped out. In the remaining Corn Belt states the wipe-out was fifty percent or more. In general, the greatest increases in the boom and the greatest declines in the bust occurred in regions with the most productive agricultural land.

The land price boom and bust from 1972 to 1987 was a prime-land phenomenon. This sets it apart from other boom-and-bust periods in the history of farmland price movements in the United States. Our traditional farmland price cycles up to the second World War had been triggered by expansion into marginal or newly-settled lands. This was a minor aspect of the 1972-87 period. In this sense it can be considered a misreading of profit potentials at the intensive margins of agricultural land use, rather than at the extensive margins. Our most recent cycle in farmland prices involved primarily the rich, rather than the poor. This can be read as one measure of the extent to which American agriculture has fully matured.

## III. Sources of Demand During the Boom

The principal demand for land in the recent boom involved not only the better lands but also the nearest neighbors. Nationally, and at the peak of the boom, farm owner-operators were buying two-thirds of the acres sold, tenants ten to twelve percent, and non-farmers approximately one-fourth. In the Lake States, Corn Belt, and Northern Plains, owner-operators bought two-thirds to three-fourths of the area transferred, and non-farmers ten to twenty percent. The predominant demand for land in the areas that experienced the greatest price increases came from neighboring

farmers, expanding the size of their operations. In this sense the 1970's land-price boom in the Midwest was home-grown (USDA, 1984).

Data for Minnesota provide the clearest evidence of this trend to market dominance by farm expansion buyers. Figure 1 shows the distribution of farmland purchases from 1954 to 1988 among three classes of buyers: Those buying to expand an existing operation, those taking over intact farm units as operating buyers, and investors who were neither expansion buyers nor did they intend to be operators. By the end of the boom farm expansion buyers accounted for 75 to 80 percent of all farm sales statewide. In the south central Corn Belt counties, where land price increases had been most extreme, the figure approached 90 percent. In these same counties, from 80 to 90 percent of all buyers lived within 10 miles of the tracts purchased (Smith and Raup, 1983).

While comparable data are not available for other Midwestern states, it seems reasonable to conclude that the driving force in the land boom after 1972 was a search for economies of size by neighboring farmers. In this search they were apparently driven by a belief in ever-expanding markets for farm products. What accounted for this belief?

## IV. Understanding the Origins of the Land Boom

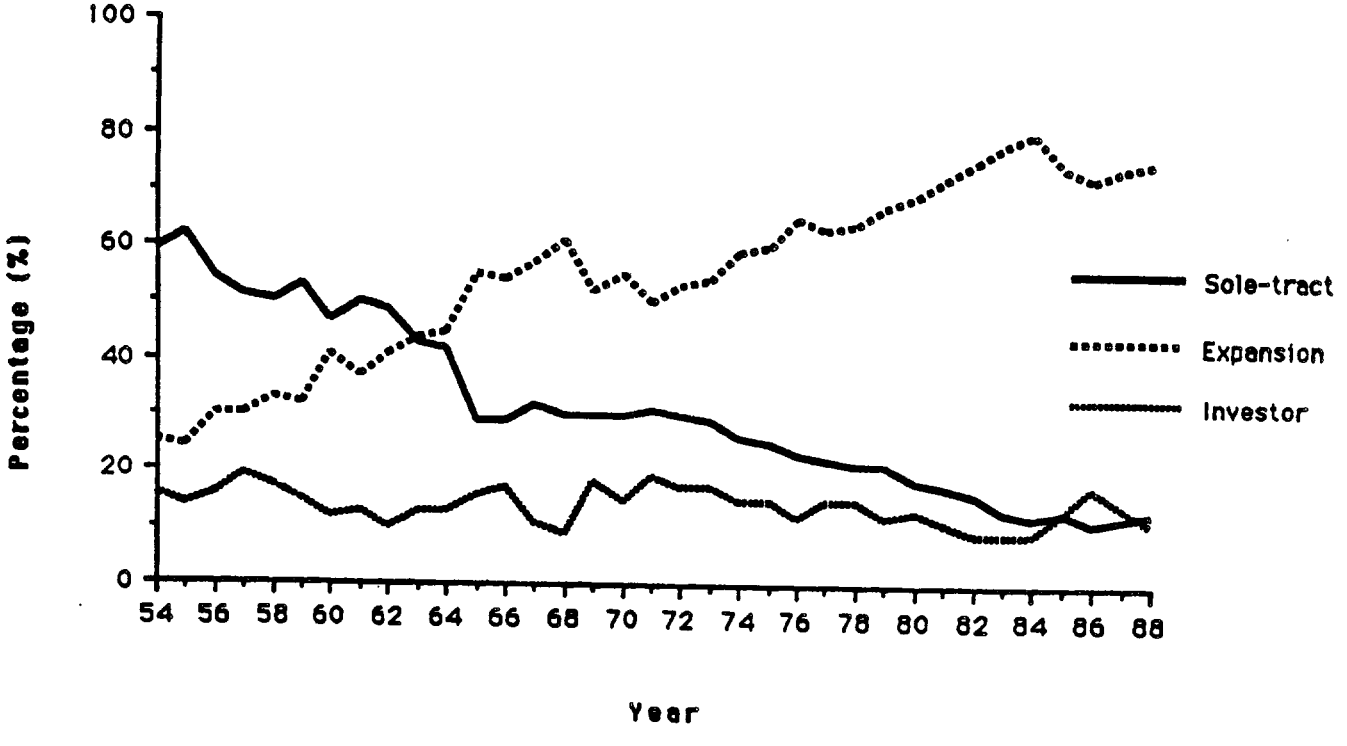
The early years of the 1970's mark a hinge-point in our perception of food-supply and environmental problems in a world-wide dimension. Three events in 1972 and 1973 dramatized this shift:

a.) The unexpected appearance of the Soviet Union in the world grain market as a major importer.

b.) The formation of OPEC and its subsequent embargo of petroleum sales to the U.S. and other nations.

Figure 1

**Percentage of Farm Sales by Type of Buyer, Minnesota, 1954-1988**




Source: Schwab and Raup, 1989.

c.) The publication of the book "The Limits to Growth" (Meadows, et al, 1972) and the resultant wide publicity given to the presumption of physical supply constraints on further resource use.

The catalyzing effect of these events occurred in a setting created by a world-wide concern with the consequences of explosive population growth. The rhetoric of the era was apocalyptic. Paul Ehrlich popularized the notion of a "Population Bomb," waiting to explode, and concluded in the late 1960's that "it is already too late to prevent a drastic rise in the death rate through starvation" (Ehrlich, 1968, p. 3). Garrett Hardin wrote of the "Tragedy of the Commons", concluding that freedom to breed is intolerable and that we must recognize "the necessity of abandoning the commons in breeding" (Hardin, 1979, p. 1248). Kenneth Boulding wrote in space-age metaphor of the limits imposed by "spaceship earth", providing those concerned with land resources with one of their most evocative symbols (Boulding, 1966).

The central premise of the concern with resource limits lies in what can be called the "finite assumption". The notion that the earth's supply of all resources is fixed seems so self-evident that it can be asserted with no proof needed. Yet it is this finite assumption that must be questioned.

In terms of the measurements used to estimate resource supply, there can be no resources until they are recognized by human beings. Quantity cannot be measured except in terms of the use to which the resource can be put. These uses, in turn, are functions of perception, rates of recovery, costs of transport, efficiency in conversion, prices, and

consumer tastes. These change, and the available stock of resources changes with them.

A stock of resources is thus inadequately measured in terms of physical quantities. In economic terms, the stock does not exist until it can be used by human beings. A resource, in this view, is a cultural achievement, for which the proper measurement units can only be defined in terms of our intelligence and skill in putting resources to use. At any one time, intelligence and skills are limited. But the history of the human race provides no evidence that they are fixed or finite over time. If resources can only be defined in terms of human intelligence, and if this is not finite, then the stock of resources cannot be finite.

This is the lesson that was forgotten or rejected in the build-up to the land-boom of the 1970's. The participants in that boom may never have heard Will Rogers dispense his famous advice to "buy land, they ain't making it any more", but they acted on that belief. Overriding any calculations of tangible profits from land appreciation or economies of size was a profound belief that the world was running out of land. Relearning the lesson that economic land is made, not discovered, and that its supply is not properly measured in acres, is perhaps the most important lesson taught by the recent land boom and bust.

## V. Fueling the Boom

A belief in the ultimate wisdom of buying farm land was not confined to farmers, it infused their creditors as well. Almost by definition, booms in any market run on credit and the land boom of the 1970's was no exception. Throughout the life of the boom credit was never a constraint. Instead, it fueled the boom.

Until well into the 1960's credit-financed farmland transfers rarely exceeded 60 percent of all transfers for the US as a whole, and the ratio of debt to purchase price was typically under two-thirds. Both of these ratios rose in the late 1960's, and reached unprecedented levels in the 1970's. By the end of the boom, credit-financed transfers accounted for 93 to 95 percent of all transfers in the Corn Belt, Lake States, and Northern Plains, and ratios of debt to purchase price ranged in these three regions from 79 to 83 percent (USDA, 1984, pp. 26, 28). Land market-related debt on this scale had never before been recorded in the United States. In this dimension the farmland boom of the 1970's was unique in U.S. history. It reflected an intense drive for market share by farmland creditors, and especially by the Federal land Banks.

Total outstanding farm real estate debt as of January 1 (excluding real estate debt held by farm households) increased 3.9 times from 1970 to the peak in 1984-1985. In that same period farm real estate debt held by Federal Land Banks increased 7.4 times, that held by the Farmers Home Administration 4.5 times, by banks 3.0 times, by individuals and others 2.8 times, and by life insurance companies 2.2 times (Federal Reserve Bank, Dec. 1984). The major shift in market shares was to the Federal Land Banks, and in smaller degree to the Farmers Home Administration. The greatest proportionate losses in market shares were by life insurance companies, individuals and others, and commercial banks, in that order, as shown in Table 3.

The dominant position of the Federal Land Banks in farm real estate mortgage lending was one of the most distinctive characteristics of the land boom of the 1970's. For twenty years, from 1948 through 1967, life insurance companies had held the predominant share of farm real estate

Table 3: Shifts in Market Share of Outstanding Real Estate Debt of Farm Businesses as of January 1, 1970 and 1985 (excluding Real Estate Debt of Farm Households)

| Lender Category | 1970 | | 1985 | |
|---|---|---|---|---|
| | Debt in Millions of Dollars | Percent of Total | Debt in Millions of Dollars | Percent of Total |
| Total Real Estate Debt of Farm Businesses | 26,246 | 100.0 | 102,000 | 100.0 |
| Distribution by Type of Lender | | | | |
| Federal Land Banks | 5,977 | 22.8 | 44,300 | 43.4 |
| Farmers Home Adm. | 2,029 | 7.7 | 9,100 | 8.9 |
| FLB plus FmHA | 8,006 | 30.5 | 53,400 | 52.3 |
| Banks | 3,116 | 11.9 | 9,400 | 9.2 |
| Life Insurance Co. | 5,222 | 19.9 | 11,700 | 11.5 |
| Individuals and Others | 9,902 | 37.8 | 27,500 | 27.0 |

Agricultural Finance Data Book, Research Division, Federal Reserve Bank, Washington, D.C., December 1984, p. 21. Debt peaked nationally at $102,821 million in 1984, but somewhat later in many of the major farming regions.

debt. They were overtaken by the Land Banks in 1968, at first slowly and then with a rush after 1970. In the twenty years from 1966 through 1985, the Land Banks increased their market share in every year except 1984, from 20.0 percent in 1966 to 43.4 percent in 1985.

The pattern of shifts among other debt holders shows interesting variations. The share of outstanding debt held by commercial banks was remarkably constant at 12 to 13 percent throughout the 1960's and 1970's. Their share of total farm business real estate debt in 1979 was almost exactly the same as in 1970. It declined briefly in 1980-83 and then began a rise that is still continuing.

In contrast, life insurance companies lost market share in every year from 1966 through 1985 except in 1978 and 1979. This suggests that the less aggressive policies of life insurance companies in farm real estate lending in the early years of the land boom were reversed in the mid-1970's. They undoubtedly found themselves at the end of the boom with a disproportionate number of mortgages written late in the boom at the high end of the cycle in land prices and interest rates.

This leads to some reflections on the methods used by creditors in valuing farmland. A now-conventional approach is to use a bid-price model, in which the traditional capitalization formula is modified to take expectations of future trends in revenues and interest rates into account. This encounters difficulties in periods of rapid inflation.

A change in the expected real rate of inflation does not lead to an increase in land values, if interest rates are free to adjust to take the expected rate of inflation into account. The increase in the expected rate of inflation will be approximately canceled out by the rise in the

expected nominal rate of interest, leaving the real rate of interest unchanged. But what happens if the expected real rates of interest turn negative?

In theory, this is not supposed to happen. In a fully functioning capital market nominal interest rates are presumed to adjust to expectations of inflation rapidly enough to maintain a positive real rate of return to capital.

In fact, negative real rates of interest do occur. Real rates of interest on Federal Land Bank farm mortgage loans were negative in 18 of the 32 quarters from 1973 through 1981.

If the expected rate of inflation is large enough and persistent enough to lead to expectations that the real rate of interest will become negative, then capital will have no cost. The bid-price model breaks down. Dividing an expected positive real rate of return to farm assets (land) by an expected negative real rate of interest leads to a nonsense result.

If there are differentials in the speed with which nominal interest rates adjust to expectations of inflation in various sectors of the economy, then the effects of inflation will be most pronounced in those sectors that are slowest to adjust. In the U.S., the farm mortgage loan sector has been especially slow to adjust nominal rates of interest when confronting inflation. This increased the attractiveness of the use of credit to purchase farm land in the 1970's, thus providing one of the best ways to benefit from the tendency for nominal interest rates to lag behind the market in a period of rising inflation.

A key lesson taught by the land boom of the 1970's is that the FLB, the insurance companies, and other lenders fed inflationary tendencies by failing to raise interest rates fast enough and high enough to maintain a

positive real rate of return on capital. Market share can be achieved at a price that is too high.

One additional lesson taught by the land boom is a new appreciation of the power of anticipated capital gains, in nominal dollars, to blind people to the trends in real income, measured in deflated dollars. This is illustrated in Figures 2 and 3.

In corn-soybean counties of southwestern Minnesota real cash farm income per crop acre peaked in 1974 and fell almost continuously to 1984. In contrast, real land values per acre peaked in 1979, five years after the peak in real cash income per crop acre.

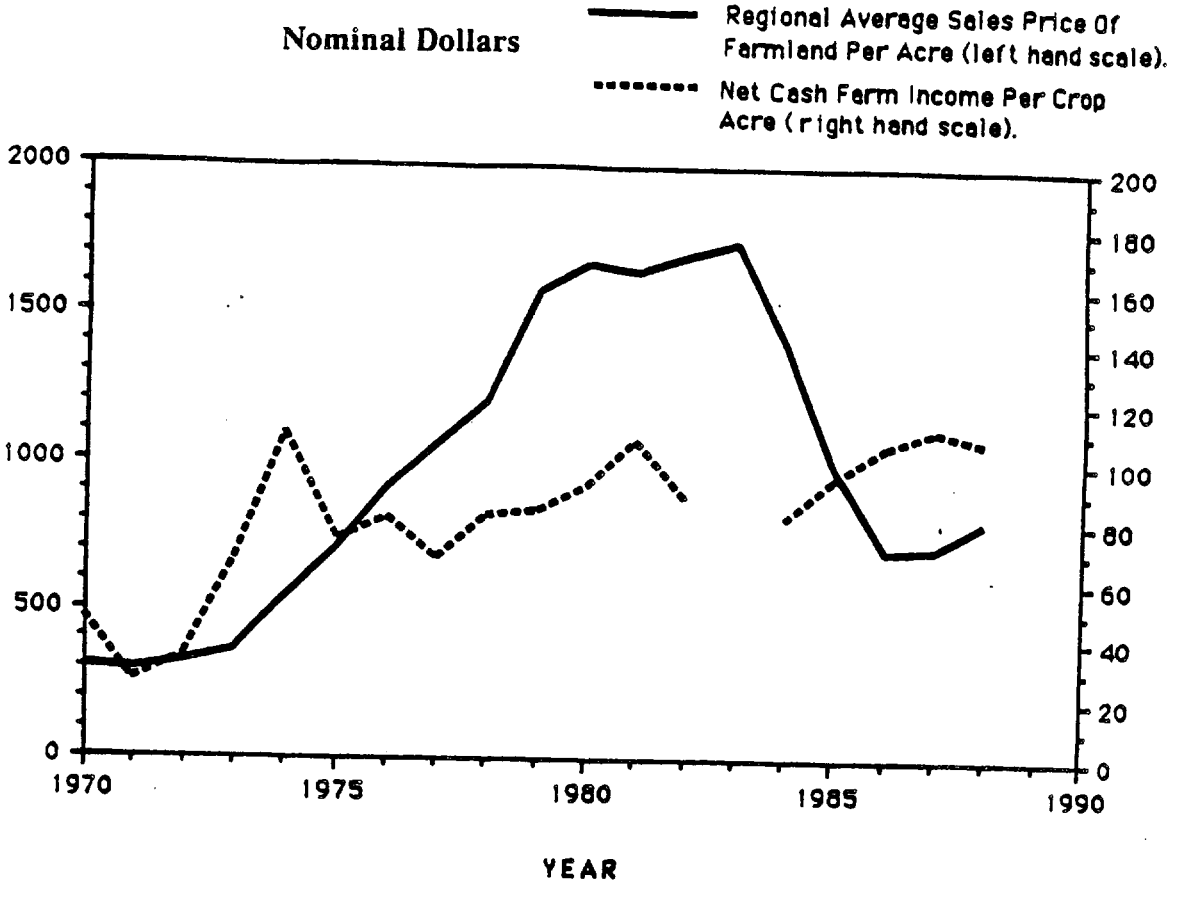
In nominal dollars, cash income per crop acre peaked in 1974 and fluctuated thereafter in a rather narrow range of between approximately $80 and $110 per crop acre throughout the fifteen years from 1974 through 1988. During the land boom period, which in southwestern Minnesota lasted from 1972 to 1983, both nominal and real cash income per crop acre rose only in the first three years, 1972-1974. In the years of greatest land boom activity, the trend in nominal cash income per crop acre was essentially flat and the trend in real income was falling sharply.

One tentative conclusion is that, except for the first three years, those valuing land for purchase or for credit were capitalizing expected future capital gains into bid prices or appraisals.

A second tentative conclusion is that conventional approaches to land valuation are irrelevant in a period of growing inflation. Psychological considerations take command, and the boom feeds on itself. In the absence of sharp credit rationing, the interest rate loses its power to guide

Figure 2

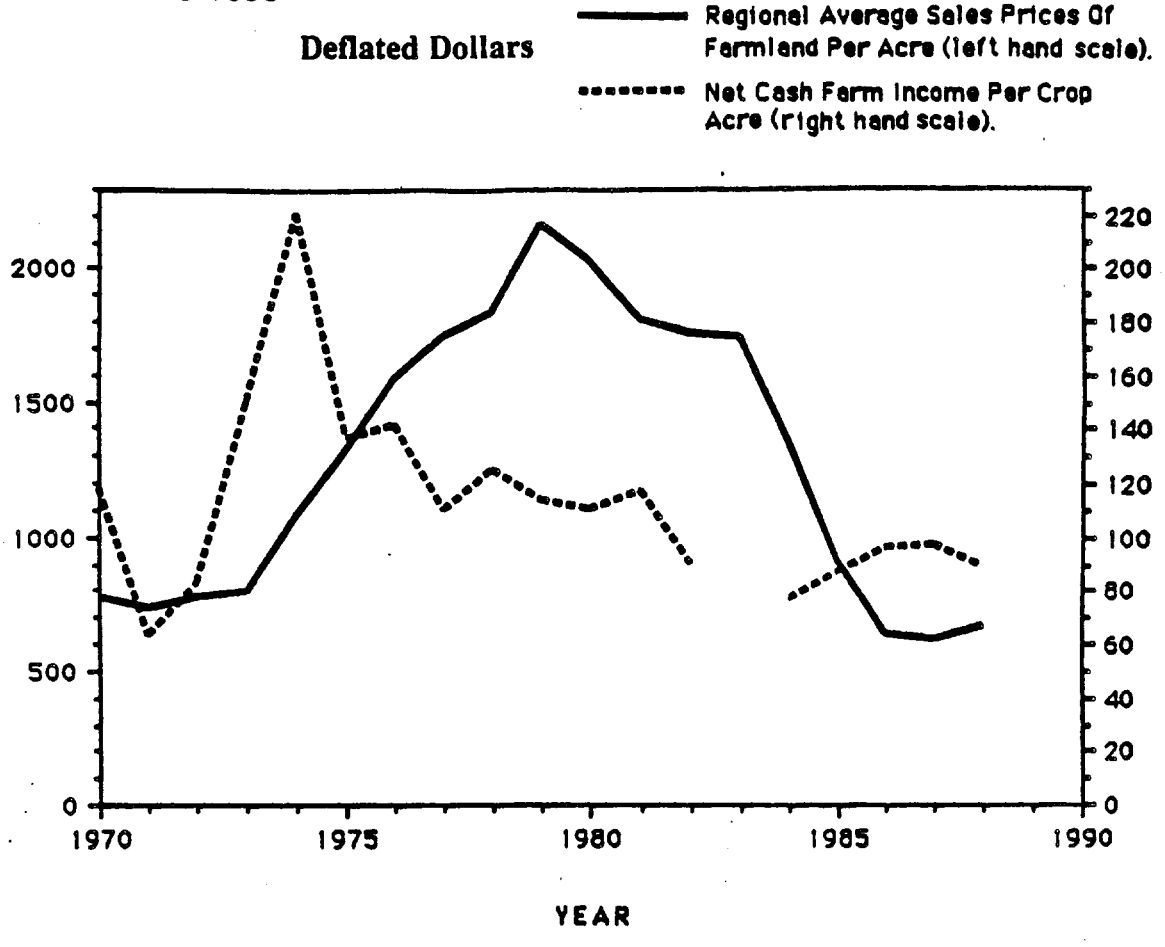
**Trends in Land Prices per Acre[a] and Net Cash Farm Income per Crop Acre[b], Southwestern Minnesota, 1970-1988**




[a]Annual University of Minnesota Survey of the Rural Real Estate Market (Economic Development Region 8).
[b]Annual report of the S.W. Minnesota Farm Business Management Association; 1983 data being revised.

Figure 3

**Trends in Land Prices per Acre[a] and Net Cash Farm Income per Crop Acre[b] (Deflated by (CPI, 1982-84), Southwestern Minnesota, 1970-1988**




[a]Annual University of Minnesota Survey of the Rural Real Estate Market (Economic Development Region 8).
[b]Annual report of the S.W. Minnesota Farm Business Management Association

investment decisions. In one often-quoted phrase, "credit loses its guardian." This characterized the boom in farmland prices in the 1970's.

## VI. A Concluding Reflection on the Growing Linkage Between the Markets for Farmland and Housing

The major trend in land use in the United States since the Second World War has been the expansion of non-farm residences into formerly rural areas. The rural non-farm population now outnumbers the rural farm population in all but a few of the counties that have in the past been classified as agricultural. This is true of all counties in the Lake States, and of virtually all counties in the Corn Belt. One result has been to superimpose urban and residential concepts of land values on top of land values deemed justified by agricultural use.

The farmland market is being penetrated by the housing market, unevenly but on a massive scale. This introduces housing market risk into areas that in the past had valued land in terms of agricultural risk only. The significance of this added risk element is intensified by the fact that, with the exception of New England and the "Rust Belt" areas around the Great Lakes, the market for housing land has been relatively stable to buoyant for the past 50 years. Nothing comparable in scale to the collapse of farmland values from 1981 to 1987 has occurred in the suburban and rural non-farm housing market.

This may be about to change, for demographic reasons. Housing market studies show clearly that the demand side of the market is driven by individuals in the age group of 25 through 34. The overwhelming majority of first homes are acquired in this 10-year period in the life cycle.

The post-war baby boom in the United States led to an increase in annual births of 50 percent from 1945 to the peak in 1957, and held births above 4.0 million annually for eleven years, from 1954 through 1964. The decline was almost equally dramatic, from an annual peak of 4.3 million births in 1957 to a low of 3.1 million in 1973. The trends are shown in Figure 4.

The effect on housing demand has been unprecedented. Adding 25 years to the figures on annual births, as is done in Figure 5, shows that the boom in farm land prices from 1972 to 1981 coincided almost exactly with the period of maximum increase in the population reaching "housing ages." From 1960 to 1982 the age groups that contributed most heavily to housing demand had increased in almost every year. The annual increment remained near or above 4.0 million from 1973 to 1989, but will fall sharply to a low of just over 3.0 million in 1998.

In the next ten years the annual population of first-home buyers will fall by about one-fourth. This introduces the prospect of a glut in "starter homes" and a reduction in overall housing demand on a scale that we have never before experienced.

While the collapse of farmland prices after 1981 had only minimal impact on the demand for housing land, and may even have increased it, this relationship is not symmetrical. The prospect of downward pressure on farmland prices due to a collapsing housing market is very real. The authors of a recent study of the prospective housing market for the National Bureau of Economic Research concluded that "housing demand will grow more slowly in the 1990's than in any time in the past forty years" (Mankiw and Weil, 1988). We have no data to enable us to estimate the

Figure 4

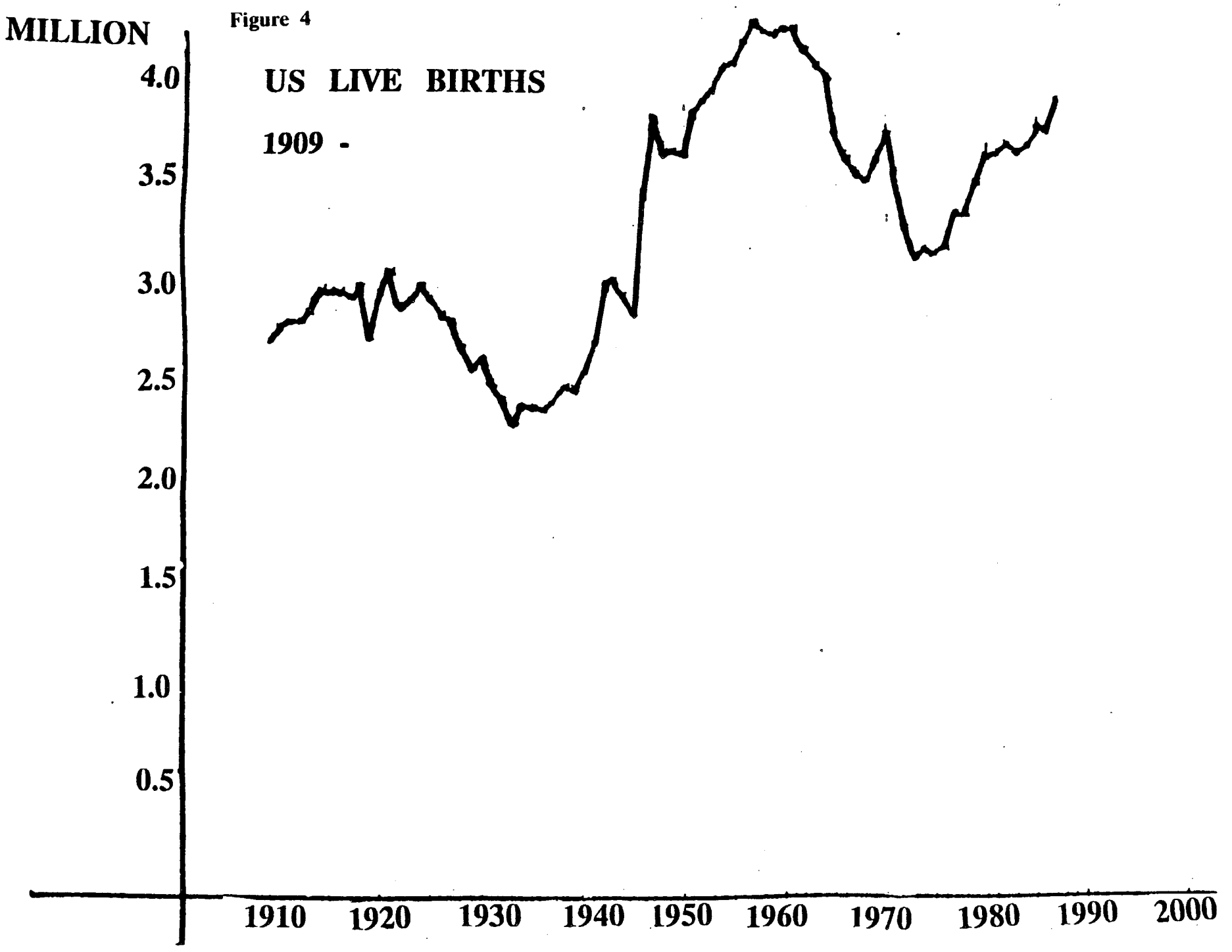
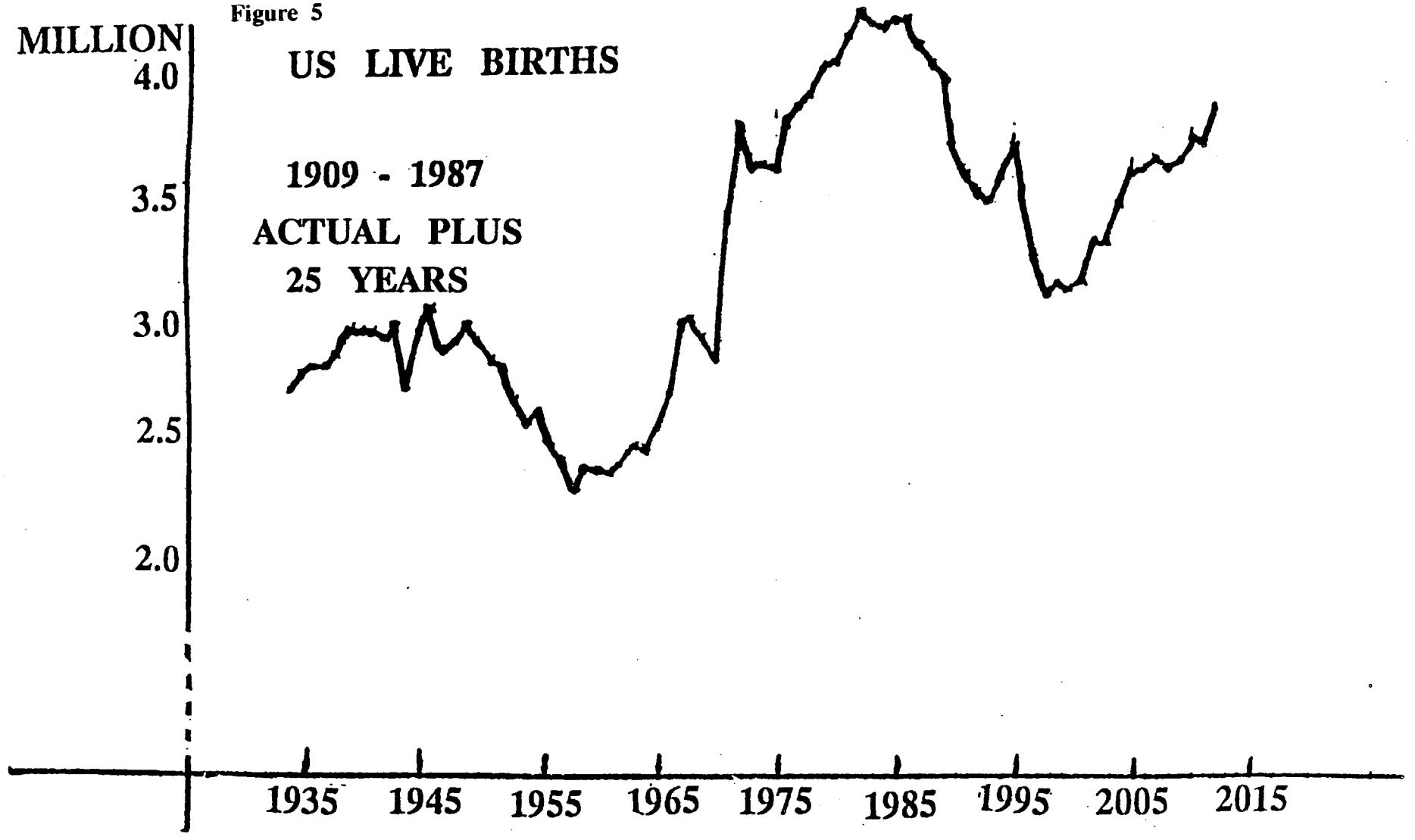

MILLION
US LIVE BIRTHS
1909 -
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
1910
1920
1930
1940
1950
1960
1970
1980
1990
2000

Figure 5


MILLION
4.0
3.5
3.0
2.5
2.0
US LIVE BIRTHS
1909 - 1987
ACTUAL PLUS
25 YEARS
1935
1945
1955
1965
1975
1985
1995
2005
2015

effect on the farmland market, but it is certain to be great, and especially in the eastern Corn Belt and Lake States. While the collapse of the boom in farmland prices in the 1980s did not drag down the housing market, there is a strong prospect that the housing market will contribute a major element of variability to the farmland market in the Midwest for the remainder of this century.

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