

DEC 17 1991

UNIVERSITY OF IDAHO

# Interest Rates and Agriculture

Roger B. Long

## Background

Between 1973 and 1979 U.S. agriculture generally prospered. Commodity prices and export levels were high. Consequently, net farm income and land prices increased.

By the end of the 1970s, inflation became a problem in the United States. To help control inflation, the Federal Reserve Board restricted the money supply, which, in turn, increased interest rates. Because of higher interest rates, farmers who borrowed money to operate saw their costs increase. Other things being equal, higher interest rates essentially redistributed income from borrowers to lenders.

The decade of the 1980s was not as prosperous for agriculture as that of the 1970s. Interest costs increased, while agricultural prices, net farm income and land values fell. Because of the dramatic differences in the welfare of U.S. farmers in the 1980s and 1970s, it is interesting to study the role of higher interest rates more precisely. The period from 1979 to 1984 especially provides an excellent opportunity to study the impact of abnormally high interest rates on U.S. agriculture.

## High interest rates and agriculture: Theoretical impacts

Higher interest rates paid by farmers can affect agriculture in several ways. Higher input costs increase the overall cost of farming and reduce net farm incomes, other things held constant. Higher production costs and lower net returns tend to reduce production levels.

A restricted money supply tends to increase the value of the U.S. dollar, which makes U.S. exports more expensive in foreign markets. Consequently, one might expect agricultural exports from the United States to fall. The higher valued U.S. dollar abroad would shift the demand for U.S. agricultural products to the left, resulting in lower product prices and incomes.

A decrease in net farm incomes and increase in interest rates lowers the present value of future farm income, which tends to depress farm cropland values.

Extremely high interest rates have a double-edged effect on agriculture if they increase production costs and at the same time increase prices of U.S. products in foreign markets. When this occurs, supply prices (costs) rise at the same time export demands fall. Such a situation leads to uncertainty in agriculture unless prices are stabilized by government programs.

Market prices for agricultural products may change by 50 to 100 percent in a short period of time when output is too great or demand shifts suddenly. Consequently, high interest rates that destabilize agricultural market prices are in direct conflict with federal agricultural price support programs. Further federal export subsidies may be necessary to enhance agricultural exports in order for them to be competitive and to help stabilize farm income.

In summary, increased interest rates may:

1. Increase costs and reduce net income
2. Decrease production (supply)
3. Reduce foreign demand for U.S. exports
4. Reduce land values

The basic question that will be answered here is whether higher interest rates from 1979 through 1984 affected net income, production, demand for U.S. exports and land values in the theoretical way.

## Interest rates

Before 1979, interest rates were generally quite low and relatively constant. From 1973 to 1978, the Production Credit Association (PCA) interest rate ranged between 7.88 and 9.43 percent. In 1981, however, the PCA rate rose to 14.89 percent and the prime rate rose to 18.27 percent (Table 1). In other words, interest rates doubled in less than 2 years after being relatively stable for 30 years.

In the short run, a dramatic increase in interest rates is difficult to adjust to and shifts income from

farmers to lenders. In the longer run, high interest rates can depress land values, production and exports.

The effects of increased interest rates in the late 1970s and early 1980s are difficult to study because interest rates were very high between 1979 and 1983 and then began to decline to more normal rates after 1983 (Table 1).

## Net income

**United States** — Generally, high interest rates do not bode well for net farm income (gross marketings minus production costs). Because interest paid represents a transfer of income to lenders, the higher the interest rate the lower the net farm income, other things held constant. If interest rates double and the amount borrowed remains constant, the increase in interest paid is a direct loss to net farm income.

Generally, when interest rates were above the 8-year average for 1979 through 1986 (12.8 percent), net farm income was below average (\$26.0 billion) (Fig. 1). In only one year of above-average interest rates, 1981, was net farm income above average and it was just barely above average. When interest rates fell below 12.8 percent between 1983 and 1986, net farm income began to rise, although the increase appears to lag falling interest rates by 1 year. Fig. 1 clearly suggests that net farm income is inversely related to interest rates.

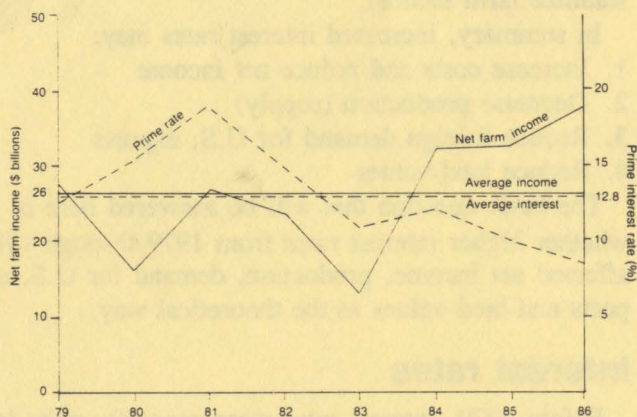


Fig. 1. U.S. net farm income compared with the prime interest rate, 1979-86.

Table 1. Interest rates in the United States, 1979-87.

Year	Prime rate	Production Credit Association rate
1979	12.67	10.71
1980	15.27	12.86
1981	18.27	14.89
1982	14.86	14.34
1983	10.79	11.49
1984	12.04	12.68
1985	9.93	11.73
1986	8.33	11.43
1987	8.20	11.60

**Idaho** — Net farm income in Idaho has been highly variable (Fig. 2). Between 1973 and 1981, net farm income was above average as often as it was below average. Drought in 1977 in southern Idaho caused net farm income to be negative, but it rebounded the next year. Between 1982 and 1987 net farm income was below average except in 1987 when interest rates declined. Obviously, net farm income is influenced by more than the interest rate.

## Agricultural production

Do higher interest rates decrease production due to higher production costs? High interest rates in the early 1980s had little immediate impact on the level of agricultural output or on cash receipts (Table 2). From 1977 to 1986, the agricultural production index grew from 100 to 113 or expanded at the rate of 1.4 percent per year. Variation in the index of production does not appear to be related to the very high interest rates in the early 1980s. Noticeable declines in production occurred in 1980 and 1983 (high interest rate years), but the overall trend in production was upward.

Cash receipts from agricultural production also generally increased from 1979 to 1986 although in some years they declined. Cash receipts increased between 1979 and 1982 in spite of extremely high interest rates. Throughout the period, declines in

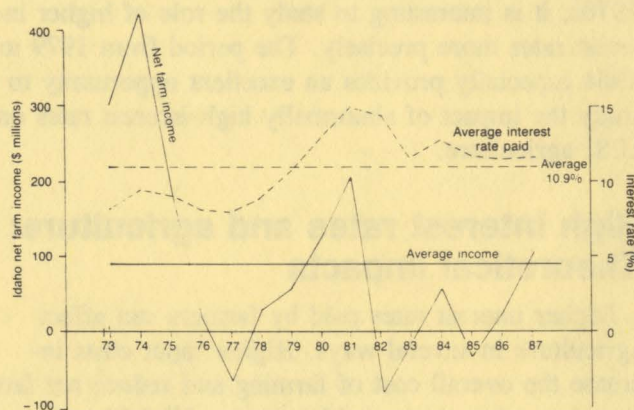


Fig. 2. Idaho net farm income compared with the average interest rate paid, 1973-87.

Table 2. Index of U.S. agricultural production and cash receipts, 1979-86.

Year	Production index	Receipts (billions)
1979	111	\$131.5
1980	104	139.7
1981	118	141.6
1982	116	142.6
1983	96	136.6
1984	112	142.3
1985	119	144.2
1986	113	135.2

production that were accompanied by increases in prices tended to keep cash receipts relatively stable.

There is little evidence in Table 2 to indicate that high interest rates caused cash receipts to fall from 1979 to 1986. Even though net incomes were low, farmers kept producing more, thus maintaining cash receipts.

By artificially maintaining prices, federal farm programs tended to protect farmers from market realities. Between 1979 and 1986, total cash receipts never fell below the 1979 level in spite of a doubling of the interest rate in two years. These statistics simply do not support the expectation that increased interest rates decrease agricultural production due to higher costs in the short run.

## Agricultural exports

Between 1970 and 1981, agricultural exports increased from \$7.3 billion to \$43.3 billion, or nearly 500 percent. Extremely high interest rates from 1979 to 1981 did not appear to affect exports during this period. However, exports declined from \$43.3 billion in 1981 to \$26.0 billion in 1986 (60 percent of the 1981 level).

It appears that increasing interest rates were not immediately correlated with falling exports. Rather, the decline in exports started in 1982 when interest rates began to fall, suggesting a delay between the onset of high interest rates and a decline in exports. In addition, the lower interest rates of 1985 and 1986 did not reduce the value of the U.S. dollar sufficiently to cause U.S. agricultural exports to expand.

On the other hand, the agricultural prosperity of the 1970s was clearly associated with rising exports. The value of agricultural exports nearly doubled from 1972 to 1973. By 1979, their value had doubled again. Exports continued to rise until 1981 when they reached \$43.3 billion, a dramatic increase from the \$7.3 billion of 1970. Agricultural exports in 1981 were 30.6 percent of total agricultural marketings of \$141.6 billion.

One of the problems associated with agricultural ex-

ports is that exports seldom are the result of free market price conditions. Trade agreements, export subsidies, trade barriers and artificial exchange rates all tend to obscure free market conditions. In spite of this, it is clear that the low, stable interest rates and rising exports of the 1970s were associated with widespread agricultural prosperity in the United States.

## Land values

U.S. agricultural real estate assets generally grew between 1973 and 1981. Their value grew from \$297.8 billion in 1977 to \$784.7 billion in 1981. They then declined to \$510.1 billion in 1986. This decline was partially due to lower net farm incomes and higher interest rates. In 1987, real estate assets began to increase again as interest rates declined.

Fig. 3 indicates a year or two lag between higher interest rates and lower farm real estate assets. A 1 percentage point increase in the interest rate is associated with a \$30 billion decline in real estate assets or about a \$100 per acre drop in price. Consequently, a 6 percentage point increase in interest rates could eventually decrease values by \$600 per acre. Such shifts in land values can have devastating effects on the assets of many farmers. Declining net farm incomes and declining land values together can put farmers in a very difficult financial position in a very short time.

## Summary

- Interest rates more than doubled between the early 1970s and 1981.

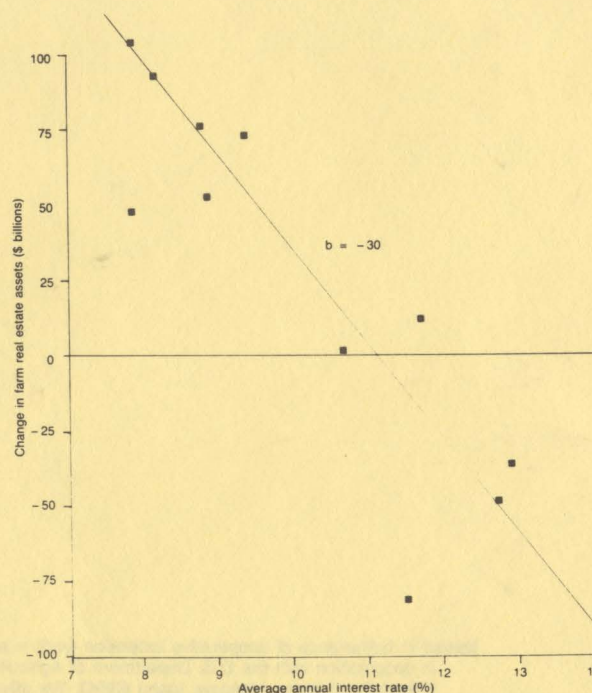


Fig. 3. Change in real estate assets of U.S. agriculture as a 1-year lag of interest rates, 1973-86.

Table 3. United States agricultural exports, 1970-86.

Year	Exports (billions)	Year	Exports (billions)
1970	\$ 7.3	1979	\$34.7
1971	7.4	1980	41.2
1972	9.4	1981	43.3
1973	17.7	1982	36.6
1974	21.9	1983	36.1
1975	21.9	1984	37.8
1976	23.0	1985	29.0
1977	23.6	1986	26.0
1978	29.4		

- As expected, higher interest rates depressed net farm income. At the national level, net farm income was below average when interest rates were greater than 12.8 percent and above average when interest rates were less than 12.8 percent.
- In Idaho, net farm income tended to be above average when interest rates were less than 10.9 percent and below average when interest rates were greater than 10.9 percent.
- Contrary to expectations, agricultural production trended upward in spite of higher interest costs.
- As expected, agricultural exports began to decline shortly after interest rates peaked in 1981.
- As expected, farm real estate assets fell as interest rates rose. In general, when interest rates were less than 11 percent, farm real estate values rose. They fell when interest rates were greater than 11 percent.
- High interest rates redistributed income from farmers to lenders. In some years in Idaho, as much income from agriculture was paid to lenders as interest as was retained by farm operators as net income, according to Idaho agricultural statistics.

Results of this research suggest that the higher interest rates of the early 1980s did not adversely affect total production or exports at the aggregate level in the years of increase. They did, however, eventually depress net farm income and real estate values. Rates in excess of 11 percent were associated with the greatest reductions in net farm income and land values. On average, from 1973 to 1986 a 1 percentage point increase in interest rates decreased Idaho net farm income by \$2,400 per farm and land values by about \$100 per acre.

### Sources of data

- U.S. Department of Agriculture. 1988. Agricultural statistics. U.S. Government Printing Office, Washington, D.C.
- U.S. Bureau of the Census. 1988. Statistical abstract of the United States. 108th ed. U.S. Department of Commerce, Washington, D.C.
- Idaho Agricultural Statistics Service. 1989. Idaho agricultural statistics. Boise, Idaho.

**The author** — Roger B. Long is professor of agricultural economics in the University of Idaho Department of Agricultural Economics and Rural Sociology at Moscow.