

Relationships Among Farm Capital, Income, and Debt, 1950-1977

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In this presentation I hope not only to describe recent trends in total farm capital, income, and debt, but also to provide perspective helpful in thinking about the current financial situation of agriculture.

Assets and debt

Chart 1 is a graph of farm assets and debt as most commonly presented. This chart has been very reassuring to those concerned about the financial health of the farming sector, as it indicates that the equity of the farming sector--the difference between assets and debt--has recently increased greatly. Many farmers today have a net worth to which most nonfarmers cannot really aspire.

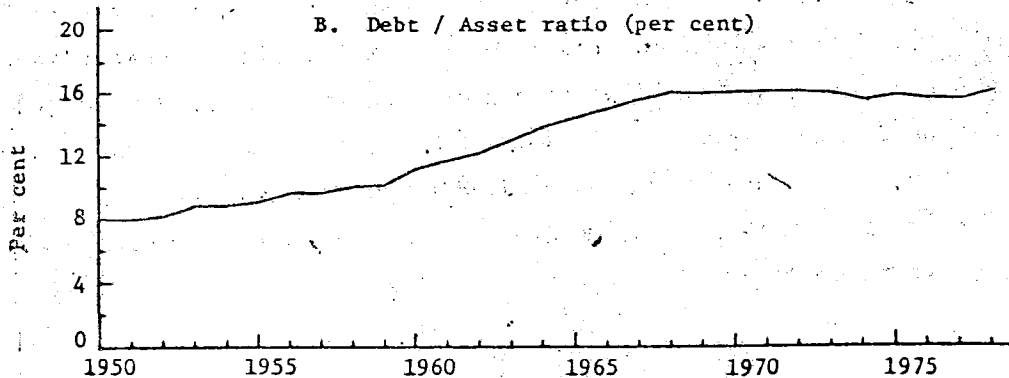
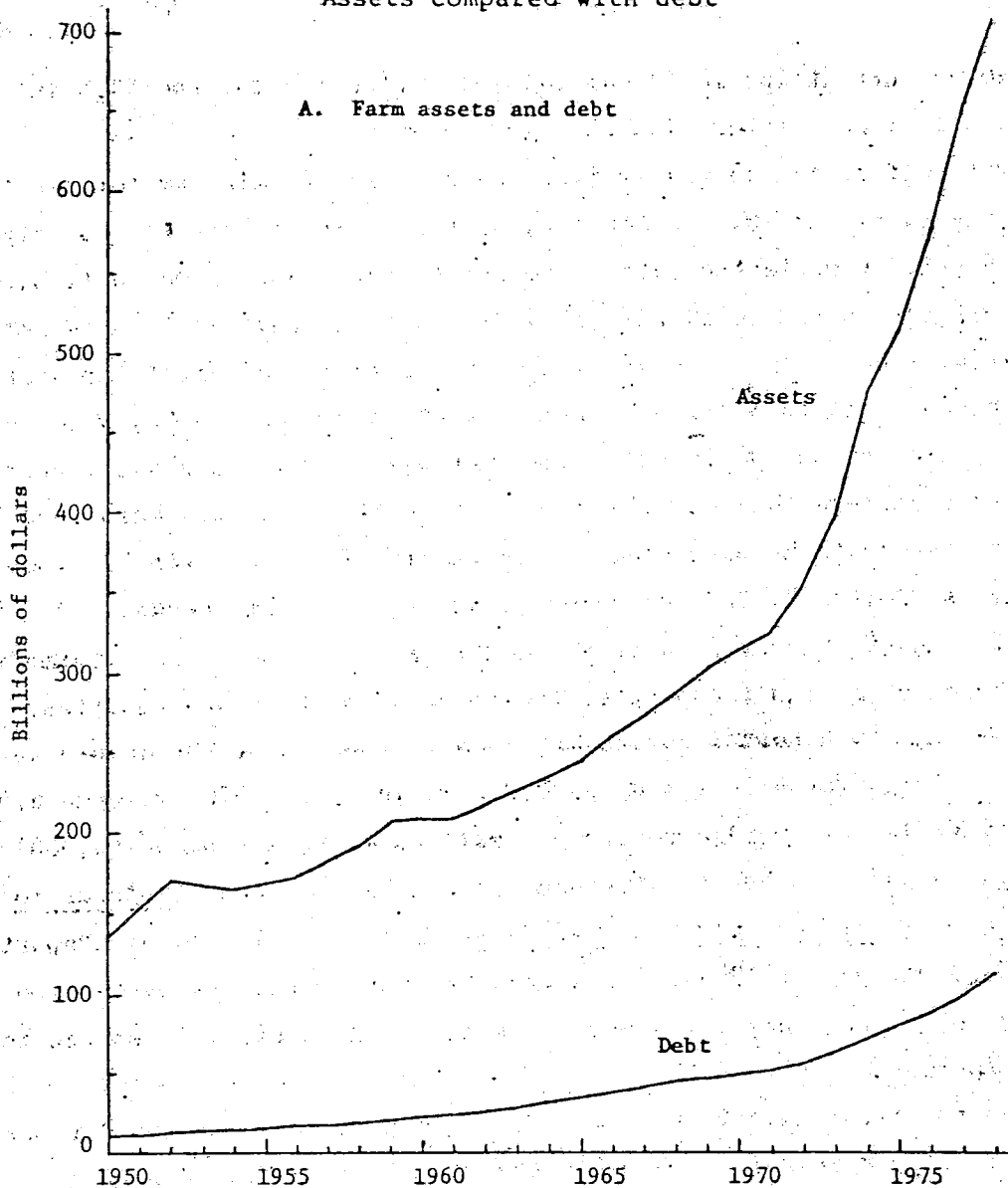
In spite of the huge increase in farm wealth, however, the sector has been experiencing financial problems. In addition, its financial prospects appear uncertain. One must turn to other data to appreciate these present and potential financial difficulties of the sector.

It is useful, first of all, to point out that farm debt actually grew about as fast as asset values during the recent boom in asset prices. Still, as the USDA noted in The Balance Sheet of the Farming Sector, 1977, agriculture's debt/asset ratio is only 16 percent whereas that in manufacturing, while not strictly comparable, is over 40 percent. The implication of this comparison is that agriculture has considerable room to increase debt as a way of easing current cash flow problems.

The problem with such action by the sector--or by the individual farmer that Mike Boehlje discussed earlier--relates to servicing the increased debt. The current interest rate on additional debt is high relative to present earnings on farm assets as a whole. Thus more borrowing reduces net income unless the funds borrowed are used in ways that increase income. If debt is increased simply to obtain funds to

Chart 1

Assets compared with debt



supplement current income in maintaining living levels, the high interest charge will reduce future income significantly.

This effect can be easily illustrated. The farming sector's return to equity last year was 2.5 percent, as the interest rate on debt averaged about 8 percent while the rate of return to total assets was only 3.5 percent. The total return to equity was \$11.3 billion. If debt were to be increased by \$141 billion at an interest rate of 8 percent, the annual interest charge would be equal to that \$11.3 billion. That increase in debt, which at current asset values would raise the debt/asset ratio to about 36 percent, would thus depress the sector's return to equity to zero. This exercise demonstrates that the potential for increasing farm debt for "unproductive" reasons is limited by the consequent reduction in farm income.

Of course, even at an average sector return of zero, many farmers would be earning significant positive returns to their own equities. For example, Bruce Hottel and Robert Reinsel found that the return to equity on large farms (sales of \$100,000 or more) in 1970 averaged 6.9 percent, while the average return on small farms (sales below \$5,000) was negative and the overall average was only 2.1 percent (Returns to Equity Capital by Economic Class of Farm, Agricultural Economic Report No. 347, USDA, August 1976). Thus even if average returns were to be further depressed, many farms would likely remain profitable enough to handle increased debt.

Another trend involving farm assets and debt warrants mention here, though it is peripheral to the main thrust of this paper. Farmers' holdings of liquid financial assets--cash and bank deposits--have declined from 7 percent of total assets in 1950 to the present level of 2 percent. The greater liquidity of farmers as they entered the adjustment period of the 1950's was reflected in the position of rural banks at that time. Most banks had very low loan/deposit ratios and were heavily invested in government bonds that could be liquidated to meet increasing farm loan demands. Now, both farmers and rural banks are far less liquid, and the future rate of loan expansion at most rural banks will be more closely tied to their deposit growth.

TABLE 711.1

CAPITAL FLOW AND ITS FINANCING
AMOUNTS IN MILLIONS OF DOLLARS

YEAR	CAPITAL FLOW								FINANCING OF CAPITAL FLOW			ADDENDUM: FARM CASH FLOW
	TOTAL	REAL ESTATE PURCHASES	CAPITAL FORMATION						TOTAL	INTERNAL FUNDS	INCREASE IN DEBT	
		FROM DISCONTINUING PROPRIETORS	TOTAL	BUILDINGS AND LAND IMPROVEMENTS	MACHINERY	LIVESTOCK	STORED CROPS	FINANCIAL ASSETS				
1950...	7762.	2304.	5458.	1522.	3152.	607.	205.	-28.	7762.	6256.	1506.	17546.
1951...	8915.	2451.	6464.	1599.	3321.	1017.	167.	360.	8915.	7098.	1817.	20449.
1952...	7842.	2401.	5441.	1614.	2966.	579.	342.	-61.	7842.	6982.	860.	19708.
1953...	6366.	2171.	4195.	1527.	3201.	-81.	-542.	90.	6366.	6738.	-372.	17648.
1954...	7188.	2296.	4892.	1425.	2739.	260.	231.	237.	7188.	6290.	898.	17113.
1955...	7199.	2589.	4610.	1385.	2760.	18.	197.	250.	7199.	5718.	1481.	16062.
1956...	5773.	2655.	3118.	1392.	2406.	-345.	-111.	-224.	5773.	4914.	859.	16086.
1957...	7584.	2861.	4723.	1411.	2512.	-211.	829.	182.	7584.	6169.	1415.	16027.
1958...	8956.	3081.	5875.	1355.	3150.	576.	248.	545.	8956.	6976.	1980.	18340.
1959...	6930.	3165.	3765.	1654.	3414.	418.	-404.	-1317.	6930.	4496.	2434.	16041.
1960...	7468.	3067.	4401.	1686.	2802.	89.	308.	-484.	7468.	6289.	1179.	16979.
1961...	8144.	3264.	4880.	1748.	2866.	372.	-36.	-70.	8144.	6333.	1810.	17691.
1962...	9309.	3354.	5955.	1832.	3190.	585.	35.	313.	9309.	6577.	2732.	18061.
1963...	9539.	3635.	5904.	1886.	3525.	396.	233.	-136.	9539.	6410.	3128.	18089.
1964...	9064.	3862.	5202.	1918.	3770.	-38.	-779.	331.	9064.	6264.	2800.	17050.
1965...	11723.	4311.	7412.	1926.	4179.	-175.	1217.	265.	11723.	7734.	3989.	19896.
1966...	11442.	4646.	6796.	2077.	4611.	221.	-304.	191.	11442.	7821.	3621.	21367.
1967...	12998.	4449.	8549.	2314.	5132.	82.	575.	446.	12998.	9893.	3106.	20002.
1968...	11677.	4308.	7369.	2146.	4550.	218.	-94.	549.	11677.	9868.	1808.	20521.
1969...	11685.	4326.	7359.	2340.	4525.	222.	-123.	395.	11685.	9120.	2566.	22928.
1970...	11820.	4138.	7682.	2367.	4918.	665.	-659.	391.	11820.	9563.	2257.	23043.
1971...	15404.	5845.	9559.	2484.	4873.	460.	937.	805.	15404.	11160.	4244.	24229.
1972...	18643.	8549.	10094.	2350.	5695.	445.	416.	1188.	18643.	11943.	6700.	30043.
1973...	26612.	11469.	15143.	3062.	7647.	1818.	1588.	1028.	26612.	16777.	9835.	47973.
1974...	20885.	9558.	11327.	4395.	8195.	454.	-2065.	348.	20885.	12758.	8127.	41793.
1975...	27261.	9883.	17378.	4684.	8653.	-1044.	4444.	641.	27261.	18301.	8960.	41661.
1976...	24367.	12274.	12093.	4956.	9199.	-682.	-1683.	303.	24367.	13221.	11146.	36852.
1977...	28084.	11896.	16188.	5933.	9432.	-1218.	1631.	410.	28084.	15421.	12663.	39691.

"REAL ESTATE PURCHASES" IS AN ESTIMATED PROPORTION OF REAL ESTATE TRANSFERS (TABLE 632.1). BEFORE 1965 TRANSFERS ARE ESTIMATED FROM REAL ESTATE ASSETS (TABLE 511.1) AND TRANSFER RATES (TABLE 631.1). CAPITAL FORMATION CONSISTS OF BUILDING AND MACHINERY EXPENDITURES (TABLE 810.1), NET ADDITIONS TO LIVESTOCK AND STORED-CROP INVENTORIES (TABLE 921.1), AND NET CHANGES IN CURRENCY, BANK DEPOSITS, AND U.S. SAVINGS BONDS (TABLE 521.2). "INCREASE IN DEBT" EXCLUDES CCC LOANS (TABLE 111.2). FINANCING FROM "INTERNAL FUNDS" IS TOTAL CAPITAL FLOW LESS THIS DEBT FINANCING. "FARM CASH FLOW," WHICH INCLUDES UNREALIZED AND NONMONEY INCOME, IS DEFINED IN TABLE 941.1.

Capital formation and debt

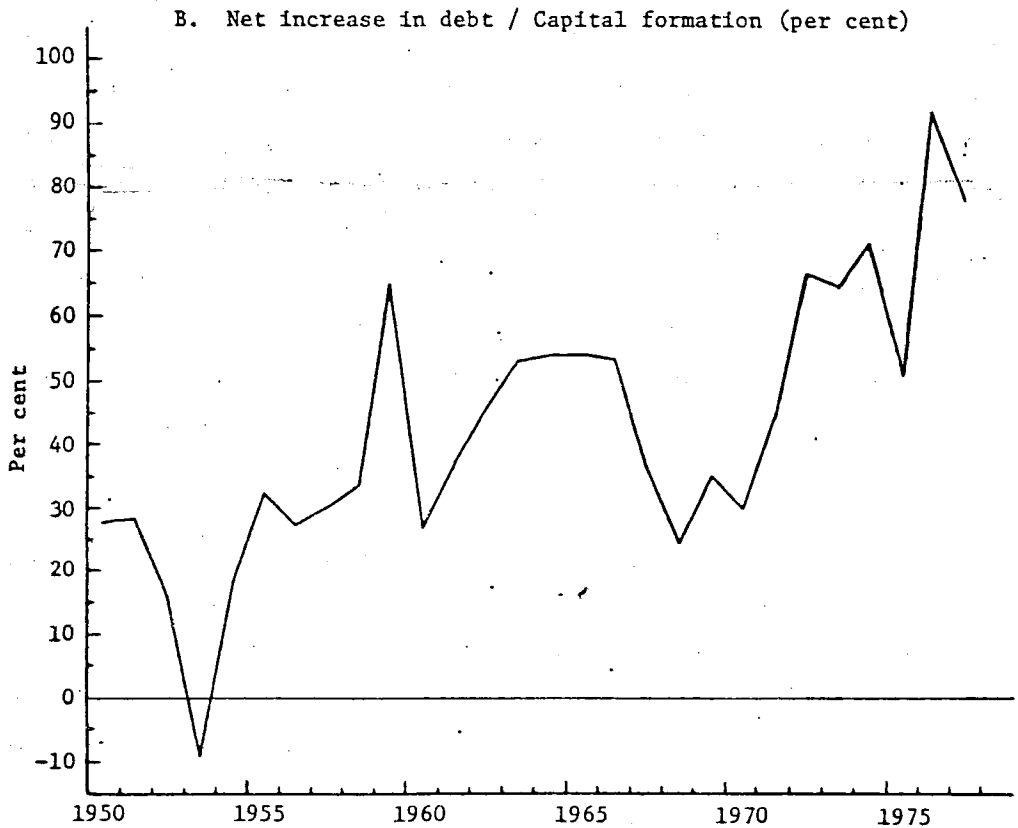
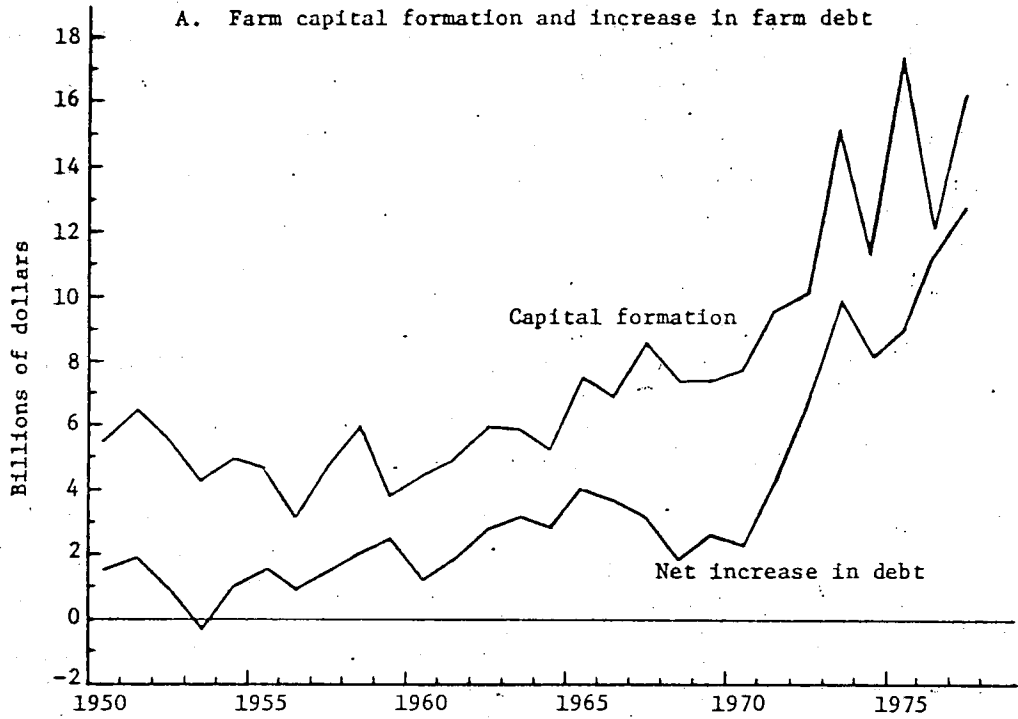
Instead of borrowing used to ride out a period of low income, both farmers and lenders like to see borrowing that promises to increase future income. To help in assessing the nature of the borrowing by farmers as a whole in any given period, it is therefore useful to compare increases in debt to the amount of capital formation and the value of land transfers. Table 711.1, reproduced from the flow-of-funds section of the Agricultural Finance Databook--Annual Series, shows the types and amounts of expenditures that comprise capital formation. Total capital formation is plotted in the upper panel of Chart 2. Note that capital formation rose only gradually during the two preceding decades and showed little growth over several multi-year periods such as 1966-70. The latter plateau was followed by a large rise in 1971-73. Since 1973, however, capital formation has not shown much overall growth (visualize a trend line passing through the large recent annual variation caused mainly by fluctuations in the additions to crop inventories).

Annual increases in debt are also shown in the upper panel of Chart 2. The big increases in debt that occurred in the first half of this decade were in large part explained by the increased capital spending. Improved farm income and income prospects were driving both capital formation and borrowing upward--a situation that borrowers, lenders, and proponents of economic growth all like.

In 1976 and 1977, however, increases in debt rose sharply even though capital formation remained near the level first reached in 1973. As shown in the lower panel of Chart 2, the ratio of debt financing to capital formation thus rose far above levels experienced in other years since 1950. It is particularly interesting to see that there was much less use of debt relative to capital expenditures in the early 1950's, at the culmination of the boom that had started during World War II. At that time, attitudes toward future economic prospects and appropriate use of credit were much different. Because many persons were anticipating another postwar depression, they avoided going heavily into debt. Agricultural finance textbooks published at the time contained numerous warnings about the dangers of debt as they had been vividly demonstrated

Chart 2

Debt financing compared with capital formation



during the 1920's and 1930's. But soon, in the new economic environment resulting from government policies and programs to stabilize both the general economy and the agricultural sector, farmers and professors alike saw the advantages of greater use of debt. Before the advent of the recent boom, attitudes toward debt had been reversed; the new textbooks, for instance, contained few warnings as they showed how to maximize financial leverage through borrowing.

Recent ratios of debt financing to capital formation represent historically high levels. In his study of the first half of this century, Alvin Tostlebe found a comparably high ratio only in 1915-19, when debt financing averaged 76 per cent of farm capital formation (Capital in Agriculture: Its Formation and Financing Since 1870, Princeton University Press, 1957). In retrospect, the boom of that period has been commonly described as an unfortunate speculative and debt-financed episode.

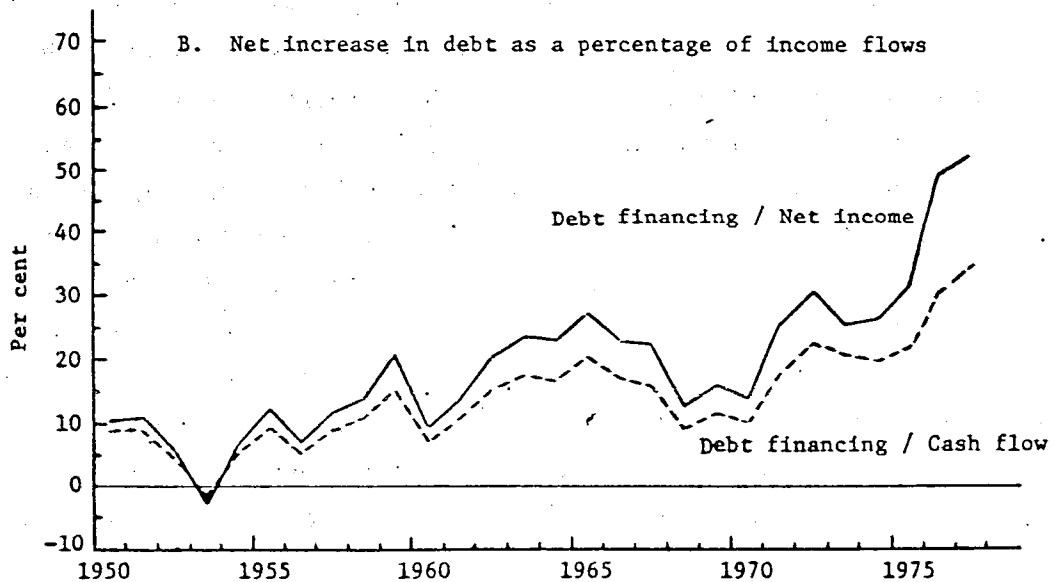
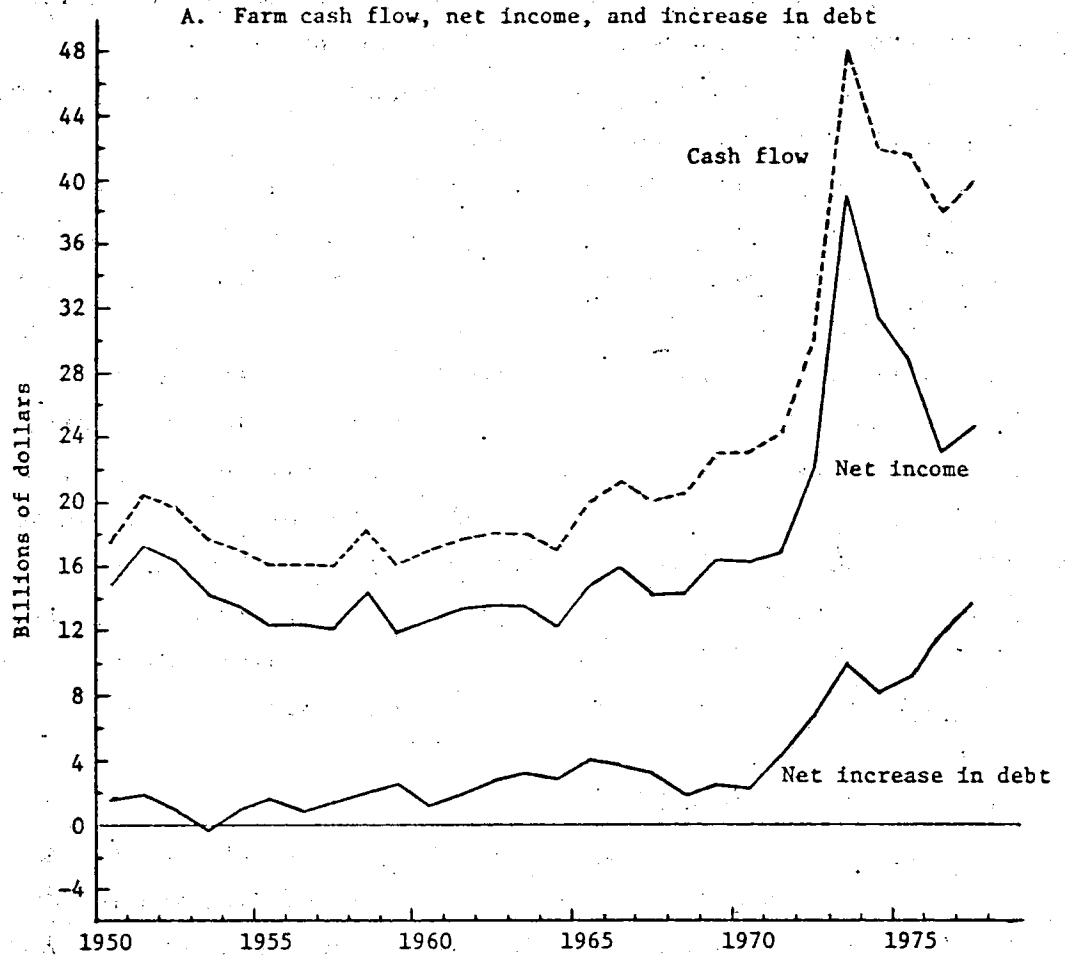
Farm income and debt

As I noted earlier, if income prospects are improving, increased debt financing often aids in achieving the income gains. But if debt is being increased mainly to alleviate current financial problems, a part of the present problem is simply being transferred to the future as the current borrowing increases future debt service and repayment burden.

In Chart 3, the upper panel shows annual increases in farm debt and also each year's farm cash flow and net income. The lower panel shows the ratio of debt financing to net income and to cash flow. It is interesting to see how low, by present standards, the relative amount of debt financing was at the height of the Korean War boom. In contrast, the current post-boom period is being entered at much higher levels of indebtedness and of ongoing debt financing. The ratios of debt financing to income flows shown in the lower panel of Chart 3 have risen into unknown territory, as Tostlebe's study shows no precedent for current levels earlier in this century. During 1915-19, when debt financing was high relative to capital formation, annual debt financing actually averaged only 16 percent of net farm income. Over the next three decades, debt

Chart 3

Debt financing compared with income flows



financing averaged only 2.2 percent of net income. Thus current and past levels of relative credit use are far apart.

On the other hand, there was a significant rise in the ratio of debt financing to income during the two decades preceding 1920 as farmers moved to more leveraged financial positions. Then, as now, a rise in the ratio indicated that debt was being incurred at an accelerated rate relative to income flows—and it is the income flows from which debt must be serviced.

There are other ways of presenting this relationship, but all tell pretty much the same story. For instance, I could have charted the ratio of outstanding debt to net income. Or, as some analysts have done, that ratio can be inverted to indicate the number of years of income it would take to repay all of the debt outstanding as of a given date. In 1960, outstanding debt equalled 1.8 years of net farm income; in 1970, 3.3 years; and in 1977, 4.4 years. Debt has increased relative to income, entailing greater future debt service burdens.

Off-farm income and debt

Before closing, it may be useful to point out that the distribution of debt among farmers differs greatly from the distribution of farmers' off-farm or nonfarm income. Off-farm income now enters into most discussions of farm financial conditions, because such income for the sector as a whole has been steadily rising. Since 1967 off-farm income of farm operator families has exceeded total net farm income (including landlords' net rent) except during the farm boom years 1972-75.

The overall level and trend of off-farm income have drawn considerable attention and analytical comment. One analyst recently concluded that the consistent increase in off-farm earnings was a major factor permitting farmers to bid up land values steadily since the mid-1950's. Other analysts have included off-farm income in the denominator of the debt-to-income ratio for the farming sector. (Because the farm debt has really exploded upward relative even to the sum of farm and off-farm income, that ratio exhibits a similar recent trend, but its lower level and slower rate of increase are somewhat more reassuring.) At a recent

meeting in North Dakota, the Secretary of Agriculture told farmers that their off-farm income exceeds their farm income.

These uses of the data on off-farm income are highly questionable because of the way in which off-farm income is distributed among farmers. Using data on the distribution of income, assets, and debt by value-of-sales classes, published in the USDA's Farm Income Statistics (July 1978) and Balance Sheet of the Farming Sector, 1978, a string of comparisons can be cited to support this point.

To begin with, 46 percent of off-farm income in 1977 was on farms with annual sales under \$2,500. These farms owed only 5 percent of farm debt. Conversely, the farms with sales of \$40,000 or more in 1977 owed 71 percent of the debt but had only 12 percent of the off-farm income.

The 162,000 farms with sales of \$100,000 or more owed 48 percent of the total debt but had only 5 percent of the off-farm income. Operators' average net farm income on these farms in 1977 was \$38,300, while the off-farm income averaged \$9,600. Debt on these farms (including landlords' debt) averaged \$312,500. At current interest rates, the off-farm income covers perhaps two-fifths of the annual interest charge on the debt, and it would hardly be a major factor in debt repayment. Assets of these farms averaged \$1,155,000, and so it seems that the off-farm income would, on average, be a relatively minor consideration when additional land purchases are being contemplated. Yet these and other large farms have been major buyers of land for farm enlargement.

It appears that the role of off-farm income as a base for debt service and as a factor in land price increases has been overemphasized by many financial analysts and other commentators on the farm scene. Very likely, these persons have simply been unaware of the distribution of off-farm income relative to that of assets and debt.

The USDA data cited in this paper reflect updates and revisions made by the USDA through September 1978.