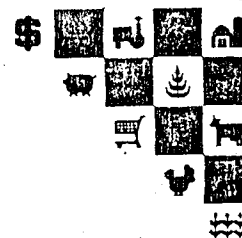


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As described in the preceding papers by John Lee and David Lins, a rise in farm debt (excluding CCC loans) of \$11 billion, or 12 per cent, in 1976 is being followed this year by a further increase of about \$15 billion, or 14 per cent. A glance at the record of the past four decades is sufficient to establish that increases of the magnitude of 14 per cent in a single year have been more characteristic of experience during farm boom years such as 1950-51 and 1973, rather than of a period such as 1977 in which farm income is relatively depressed and has few prospects for significant near-term improvement. As a result, key financial relationships examined in this paper now exhibit unusual and worrisome levels. As confirmed by reports from the most vulnerable farm lender group--rural commercial banks--the farming sector has entered a difficult financial period.

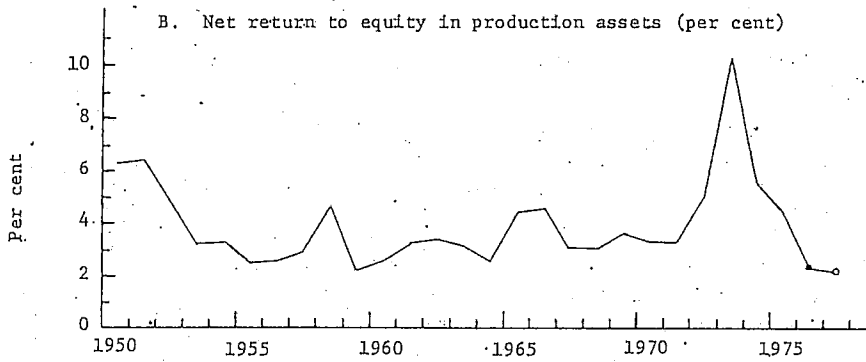
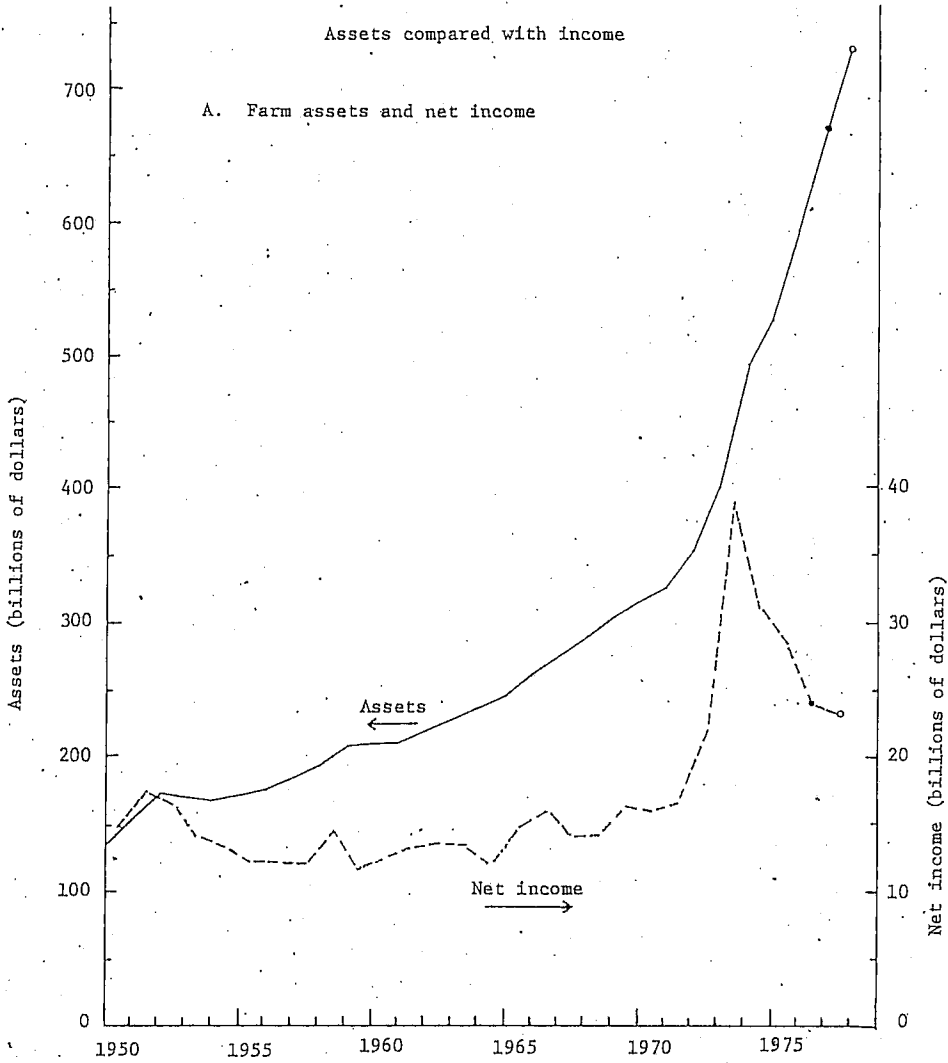
In assessing current farm financial developments, a longer-term perspective is at once both highly useful and of limited usefulness. It is useful in establishing that the sector has just gone through a major boom in capital expenditures and land prices that involved a relatively high level of debt financing. Such experience in any sector is followed by financial shocks if income flows fall significantly from the levels that triggered and fed the boom. For the farming sector, however, the longer-term perspective fails to provide an adequately relevant comparison with similar previous episodes and their aftermath. Such periods in this century are few in number as well as strongly affected by special circumstances. The prolonged farm boom spanning World War II, the Marshall Plan, and the Korean War was atypical in its lack of significant debt financing and in the highly liquid state of both farmers and rural banks at its conclusion. A small boom in the mid-1960's was too minor to provide useful analytical precedents for present experience. Recent farm income and other financial experience has been remarkably similar to the farm boom of World War I, but the financial agony following that boom is today of limited relevance--except perhaps to indicate what could occur in the absence of government farm income and credit programs and other financial innovations such as insurance of bank deposits and amortization of farm mortgage loans. Our longer-term perspective will not, therefore, provide a guide to probable *future* further experience in the sense, for instance, that business analysts expect from a study of reference cycles. But it will lead one to appreciate that the current situation is highly unusual and potentially troublesome.

The charts that accompany this paper each show annual data extending back to 1950. The changing fortunes of farming over this period are reflected in the swings displayed by net farm income, shown in Panel A of Chart 1. The

* The analyses and conclusions presented are solely those of the author and do not necessarily reflect the views of the Board of Governors or of other members of its staff.

Chart 1

Assets compared with income



Note: Net income shown is farm operators' total net income from farming (USDA series, including government payments) plus net rent received by nonoperator landlords.

Net return to equity is net income from farm production minus returns imputed to labor and management (USDA series, The Balance Sheet of the Farming Sector).

early 1950's were the concluding years of the World War II--Korean War boom, and were followed by a "cost-price squeeze" on net income during the remainder of the decade. Net income trended gradually upward during the 1960's, rose sharply in 1972 and 1973, and then began a decline that is now in its fourth year. The last value plotted for this series (and for other flow series in this set of charts) is a projection for 1977.

As also indicated in Panel A of the chart, the value of farm assets rose during most years since 1950 (the last value plotted is a projection for year-end 1977). Most of the total rise has reflected increases in asset prices--particularly increases in land prices--as net investment has been relatively minor and since 1954 there has also been a net decrease in the amount of land devoted to farming. The rise in land prices in the 1950's increased farm equity and helped to drive the annual return from production to around 3 per cent of equity, as shown in Panel B of Chart 1. Continued land price increases kept the return at about this level during the 1960's and early 1970's. In 1972, the rise in land prices accelerated in response to the sharp increase in the profitability of farming. After 1973, land prices continued to rise in the face of declining net income, and by 1976 the return to equity was driven down to 2.4 per cent. If, as John Lee has just estimated, land prices rose by another 10 per cent in 1977, then the net return to equity this year has fallen further to about 2.1 per cent.

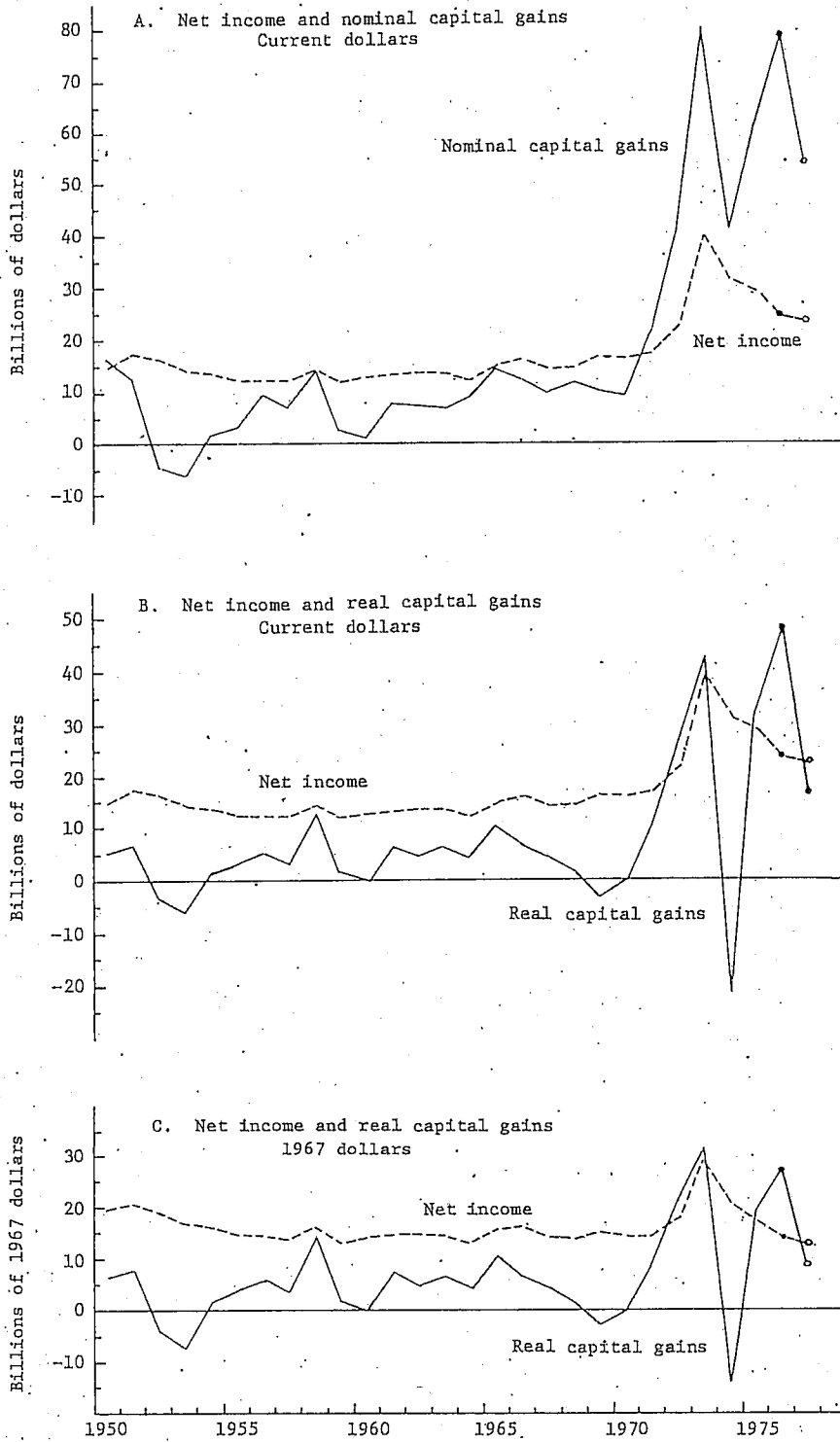
From the mid-1950's to the early 1970's, the net return to farm equity fluctuated narrowly around 3 per cent; a performance that drew considerable comment. In the early years of this period, it was thought paradoxical that land prices were rising when the return was already somewhat below that available on many other investments. As the 3 per cent rate of return persisted, however, analysts perceived it as an equilibrium level. As total returns to equity trended upward, land prices were being bid up by just enough to keep the relative return at about 3 per cent. Reinsel in 1973 noted that this process was highly visible in the case of rental farmland in stable agricultural areas. He showed that as cash rents trended upward, land prices responded in proportion, keeping relative net rental returns remarkably constant over this period. Parenthetically, as Reinsel has also pointed out, the problem with studies concluding that land price trends were unrelated to total net farm income over this period is that they are looking at the wrong income flow.

In the mid-1960's, therefore, analysts turned, in effect, to examination of the origins of the increasing net return to equity. The most powerful influence was the combination of decreasing unit costs of production (resulting from technological advances) and constant, supported, output prices. Another influence noted was that farmers' able to achieve above-average relative returns were buying land from farmers less skilled or fortunate.

The large land price increases of 1972-75 are readily explained by the sharp rise in relative returns. Clearly, if one had assumed a continuation of returns experienced in that period and a tendency for relative returns to move toward the former level of 3 per cent, then one would have concluded--as many apparently did--that land was underpriced. Now, however, if similar assumptions are applied to the returns experienced in 1976 and 1977, one concludes that farm land is

Chart 2

Three views of farm net income and capital gains



overpriced. If other things (including income, outstanding debt and interest rates) were to remain unchanged at their 1977 level, the 3 per cent rate of return to equity could be restored by a reduction of 31 per cent in the value of farm production assets. Alternatively, holding assets, debt, and interest rates unchanged, that rate of return could be restored by increasing net income from farm production to approximately the 1973-75 average.

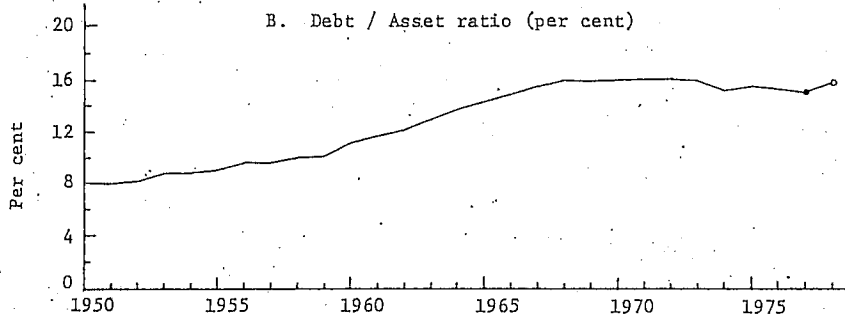
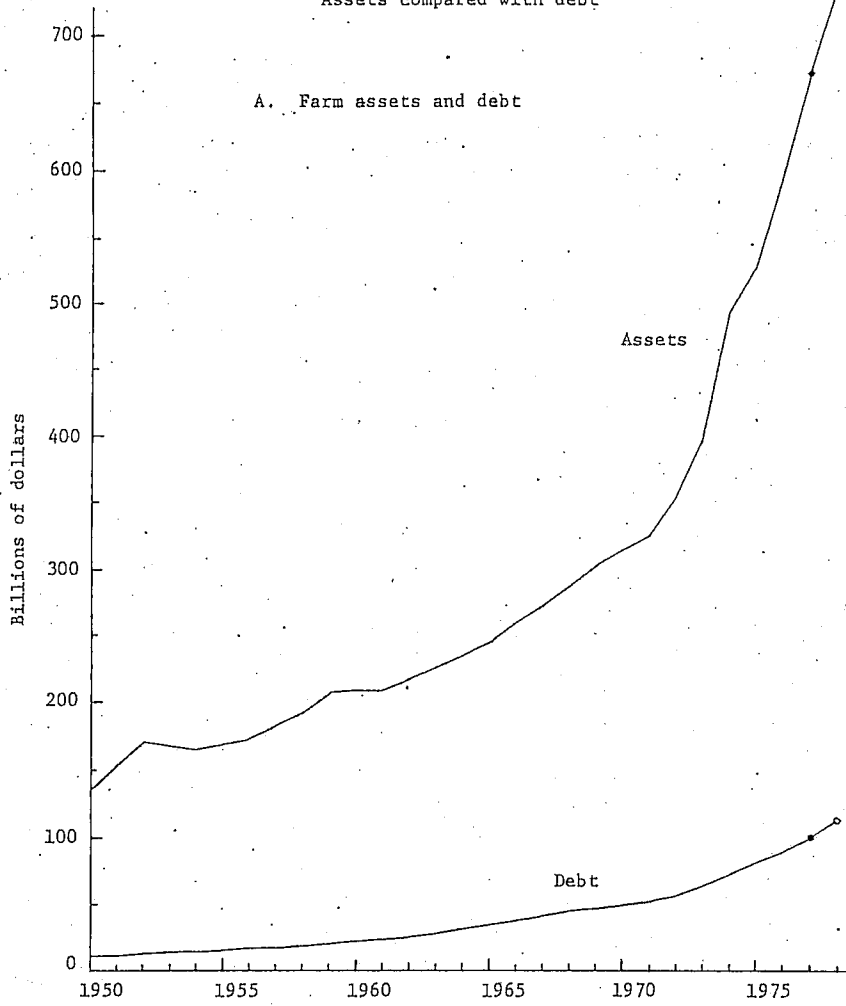
To summarize, the land price increases of the period preceding 1972 were based on increasing returns to this resource, and the factors underlying the improved returns were demonstrated. By the late 1960's, however, the prolonged period of land price rises seemed in itself to have begun to influence the land price expectations of land market participants and analysts. Panel A of Chart 2 shows data underlying this effect on attitudes. The nominal capital gains on farm assets plotted in Panel A are the increase in asset values minus such net investment as did occur each year. By the late 1960's, land market participants and analysts had noted the steady capital gains that appeared to be providing a significant supplement to net farm income, and were discussing the concept of "total returns" to farm investment. Their experience after 1971 greatly reinforced this outlook. The carefully established relationship of land prices to returns was ignored in much purportedly analytical commentary, which was instead replete with short-cut references to factors such as general price inflation, the fixed supply of land, and increasing population--all factors with a bearing on the level of returns to farm assets, but also all factors that had in the past coexisted, and could again, with periods of declining as well as advancing land prices.

Those who persist, however, in adding capital gains to income to obtain a "total return" to the farming sector should note that only the amount by which the appreciation of farm equity exceeds general price inflation represents a real gain to owners of farm assets. For example, if, as in 1977, each \$100 billion tied up in farm equity yields nominal capital gains of about \$10 billion, but in the same year consumer prices generally rise by about 6 per cent, then real capital gains are only \$4 billion. In other words, if the owners of this equity were to spend more than \$4 billion of the nominal capital gains on consumption, they would erode their real wealth position. Or if, as in 1974, prices paid by farm consumers rise faster than prices of farm assets, owners of farm equity experience a real capital loss. A comparison of net income and real capital gains is shown in Panel B of Chart 2. In real terms, capital gains over the last five years average slightly less than income, rather than overshadowing income as one might suppose after viewing nominal gains only. Also note that real capital gains disappeared in 1968-70, providing a recent example of a period in which farm assets did not appreciate faster than the rate of general price inflation.

Finally, in any comparisons over time, both income and real capital gains should be viewed in dollars of constant farm consumer purchasing power, as is done in Panel C of Chart 2. In constant dollars the recent levels of income and capital gains are revealed as somewhat more modest relative to past levels. Income, in fact, has dropped below its pre-1972 level.

Chart 3

Assets compared with debt



With returns to farm assets now relatively depressed and the continuation of real capital gains therefore in doubt, should there be concern about further large increases in farm debt such as that occurring this year? In both the popular and analytical literature, this question is commonly being examined in terms of relationships such as those shown in Chart 3. These analyses thus exude the confidence derived from the recent large absolute increase in equity and from the low over-all debt/asset ratio. They note that the farming sector's debt/asset ratio is 16 per cent and conclude that the farming sector can greatly increase its borrowings--in other words, that the debt/asset ratio is able to withstand many more upticks such as the one recorded for 1977.

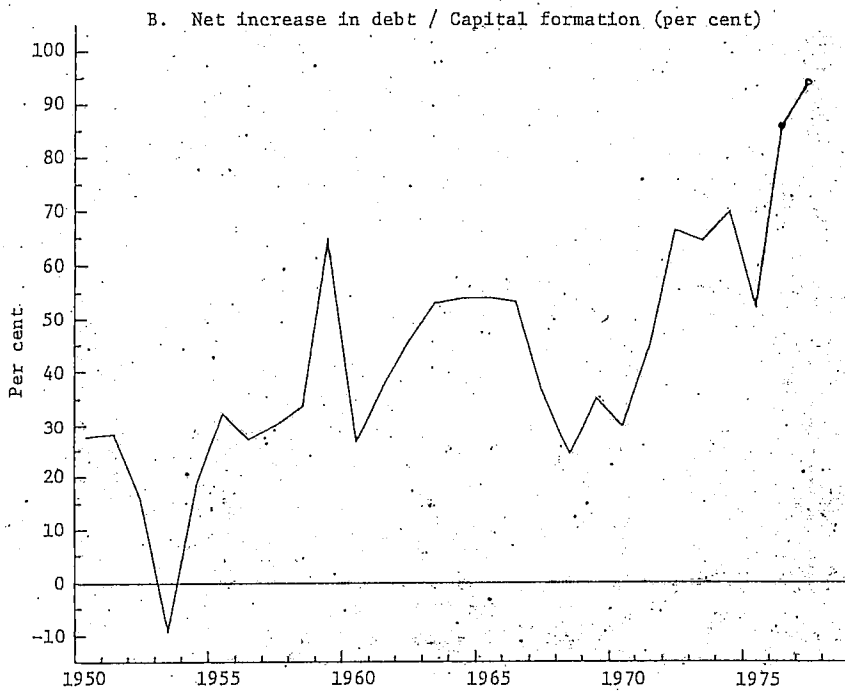
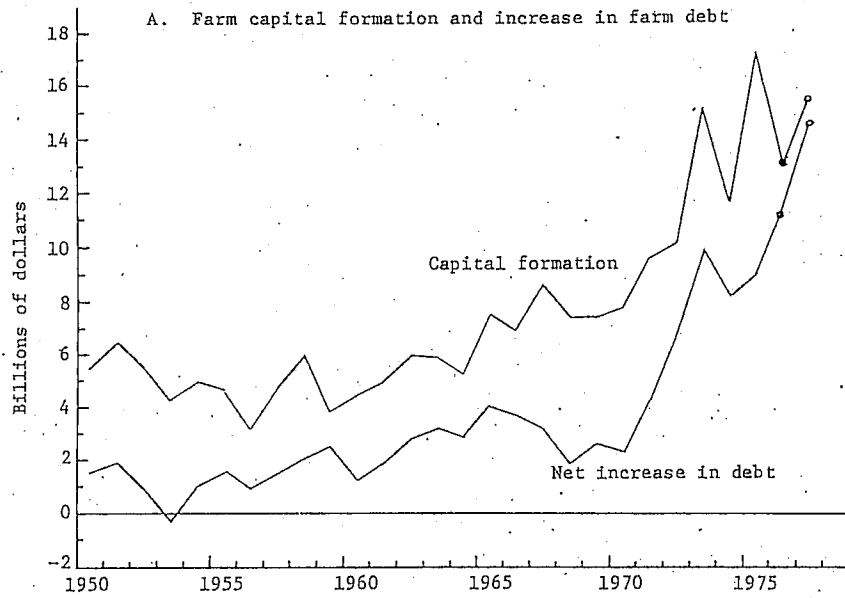
The financial cushion implied by this analysis, however, is in part an illusion. First, the ratio is now near its post-World War II high, as it was not reduced significantly during the recent years of farm prosperity and asset price increases. More importantly, the average return on farm production assets is now about 3 per cent while the interest charge on new farm loans averages about 9 per cent. Given this relationship, further borrowing by the sector would tend to reduce its net income. If, other things unchanged, the debt/asset ratio were to rise to about 30 per cent, the return to equity would fall to zero. In other words, increased borrowing cannot be sustained for long in the absence of income adequate to service the increased debt.

Other analytical approaches are more valuable in evaluating the relative usefulness and safety of ongoing increases in farm debt. The significance of increased debt financing can be assessed by examining whether it is financing increased capital formation or simply replacing internal financing of this capital flow. Panel A of Chart 4 shows that increases in debt have recently been rising faster than capital formation. Thus Panel B of the chart indicates that increased debt financing has recently replaced internal financing to a highly unusual degree. In this century, in fact, a comparably high ratio of debt financing to farm capital formation has previously occurred only once, during the ill-fated speculative boom of World War I. Upon compiling very comparable data, Tostlebe found that debt financing averaged 76 per cent of farm capital formation during 1915-1919.

Indeed, as shown in Chart 5, the recent increases in debt are far outside previous bounds of their relationship to farm cash flow and net income. Such behavior could be regarded as warranted if future increases in income were in sight, as in 1972, or if the faster rise in debt were financing significantly greater capital flows expected to generate future income gains. In the absence of such an outlook, the increased debt poses instead a relatively greater future servicing and repayment burden. The recent ratios of debt financing to income flows have no precedents in this century. According to Tostlebe, the ratio of debt financing to net income averaged only 16 per cent during 1915-19, and then fell to an average of just 2 per cent over the next three decades. The current rapid rise in the ratio does have a precedent in World War I experience, however, as the ratio then rose substantially from averages of 7 per cent in 1900-09 and 10 per cent in 1910-14. Such increases in the ratio both then and now indicate that debt commitments are being incurred at an accelerated rate relative to income flows from which they must be serviced.

Chart 4

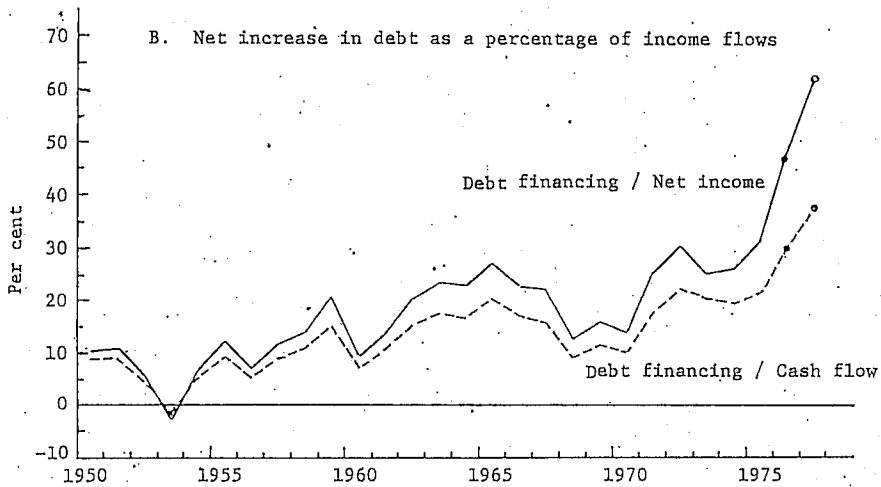
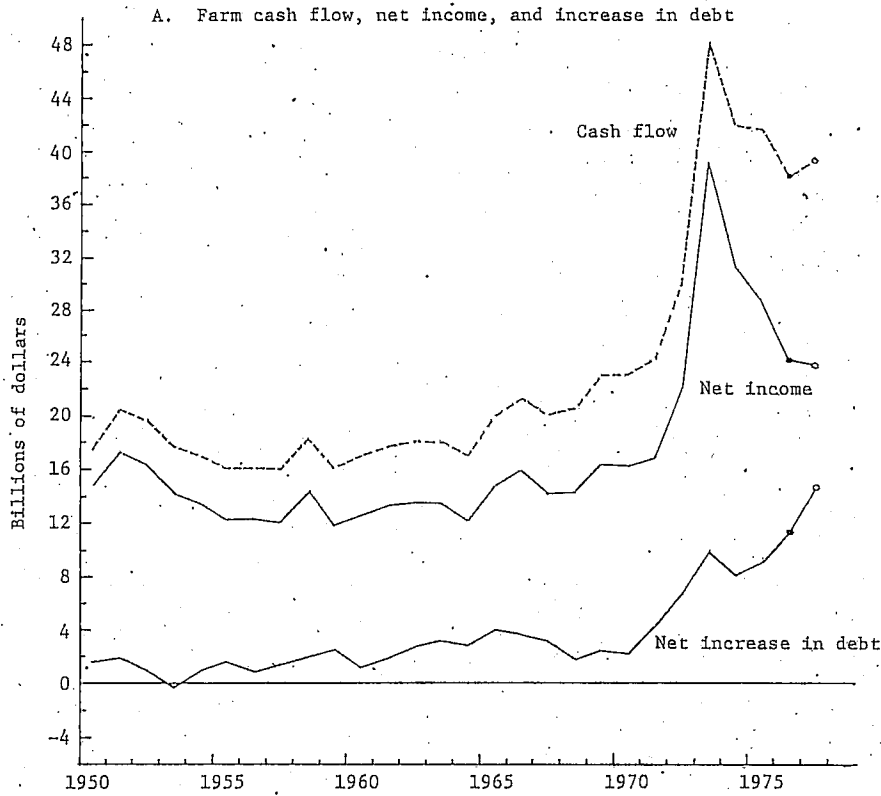
Debt financing compared with capital formation



Note: Capital formation consists of expenditures for machinery, buildings, and land improvements plus the net change in financial assets and in livestock and crop inventories.

Chart 5

Debt financing compared with income flows



Note: Cash flow is net farm income plus capital consumption allowances at replacement cost.

In summary, aggregate farm finance trends indicate a considerable potential for future financial problems, but it remains to be seen to what extent they will materialize. The key uncertainty is whether the level at which farm income settles in the post-boom period proves sufficient to maintain the past appreciation of farm assets and to support further increases in farm debt. At current income levels, the financial ratios examined in this paper are not very encouraging.

The following materials are available from the author:

- (1) An extension of this paper presenting data on liquidity and farm credit conditions at rural banks, and
- (2) A compilation of data and current estimates of farm debt, assets, capital flows, and financial ratios.

Address your request for "Outlook materials" to Emanuel Melichar, Federal Reserve Board, Washington, D. C. 20551.

CHARTS AND TABLES

Farm Finance--Current Developments in Perspective

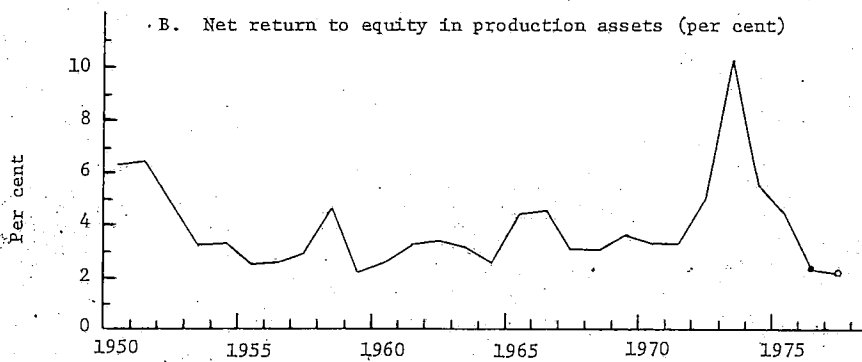
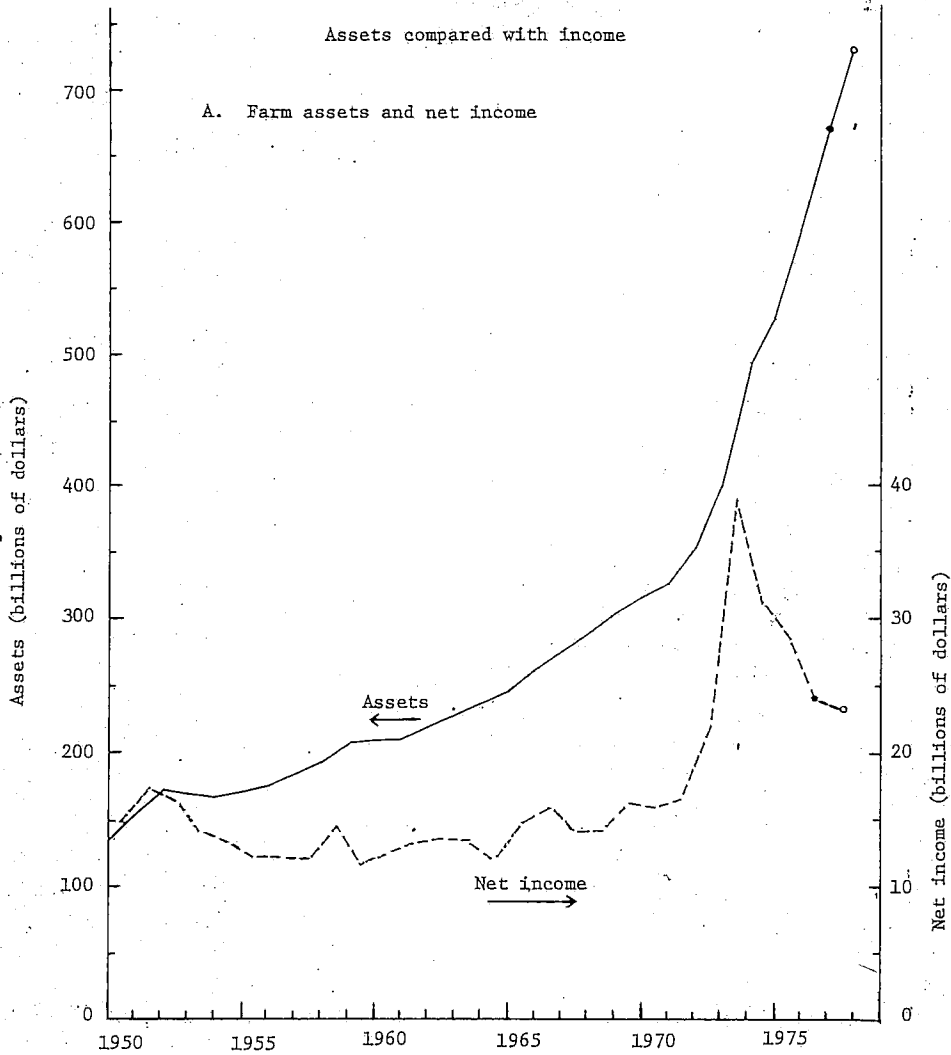
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1978 Food and Agricultural Outlook Conference
U.S. Department of Agriculture
Washington, D.C.
November 16, 1977

Chart 1

Assets compared with income



Note: Net income shown is farm operators' total net income from farming (USDA series, including government payments) plus net rent received by nonoperator landlords.

Net return to equity is net income from farm production minus returns imputed to labor and management (USDA series, The Balance Sheet of the Farming Sector).

Chart 2

Three views of farm net income and capital gains

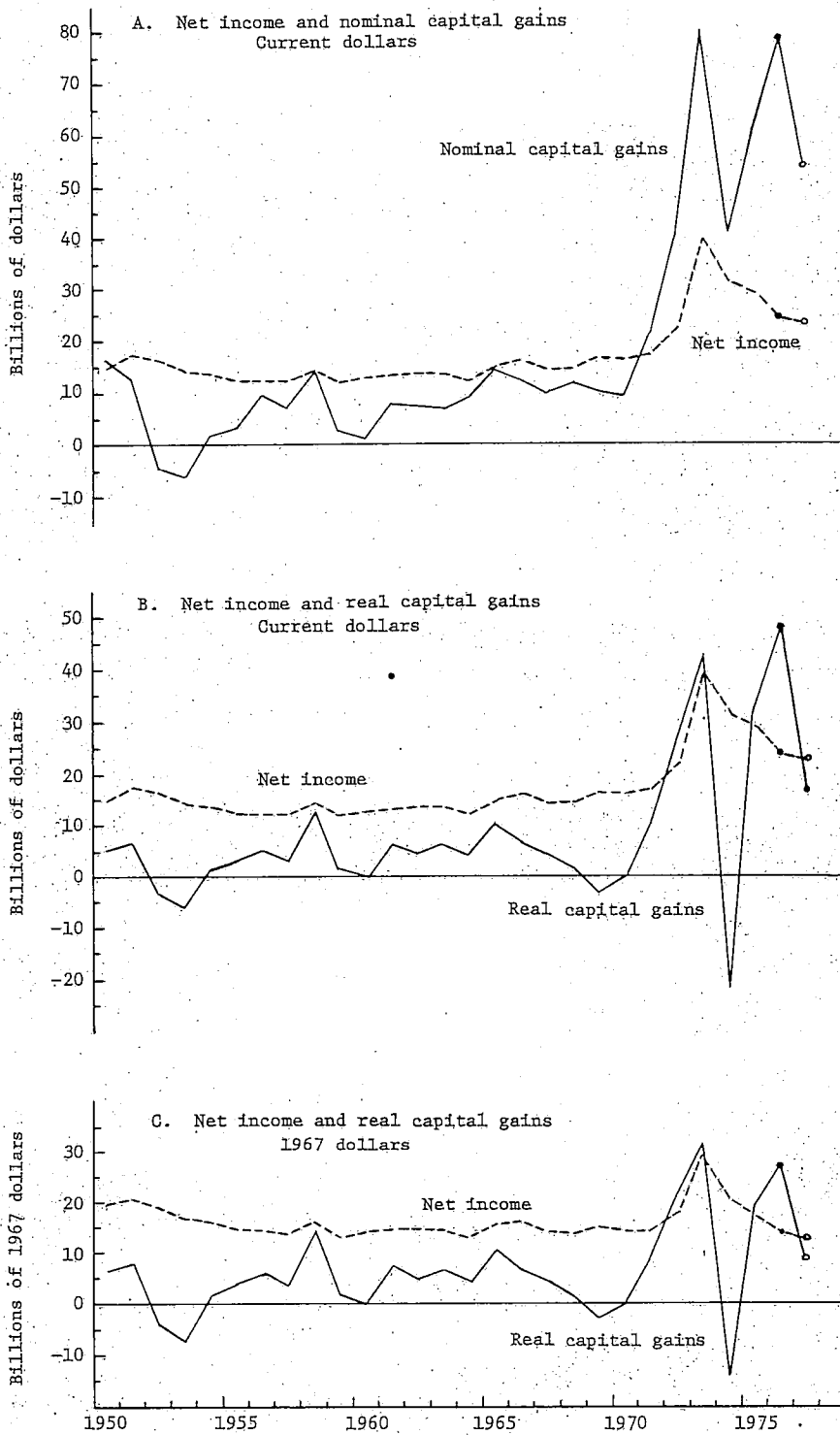


Chart 3

Assets compared with debt

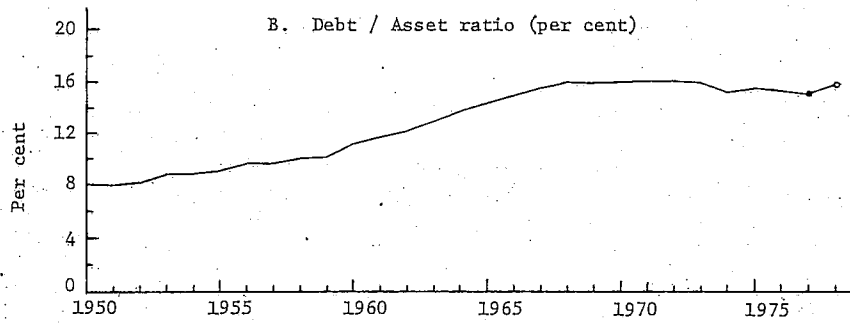
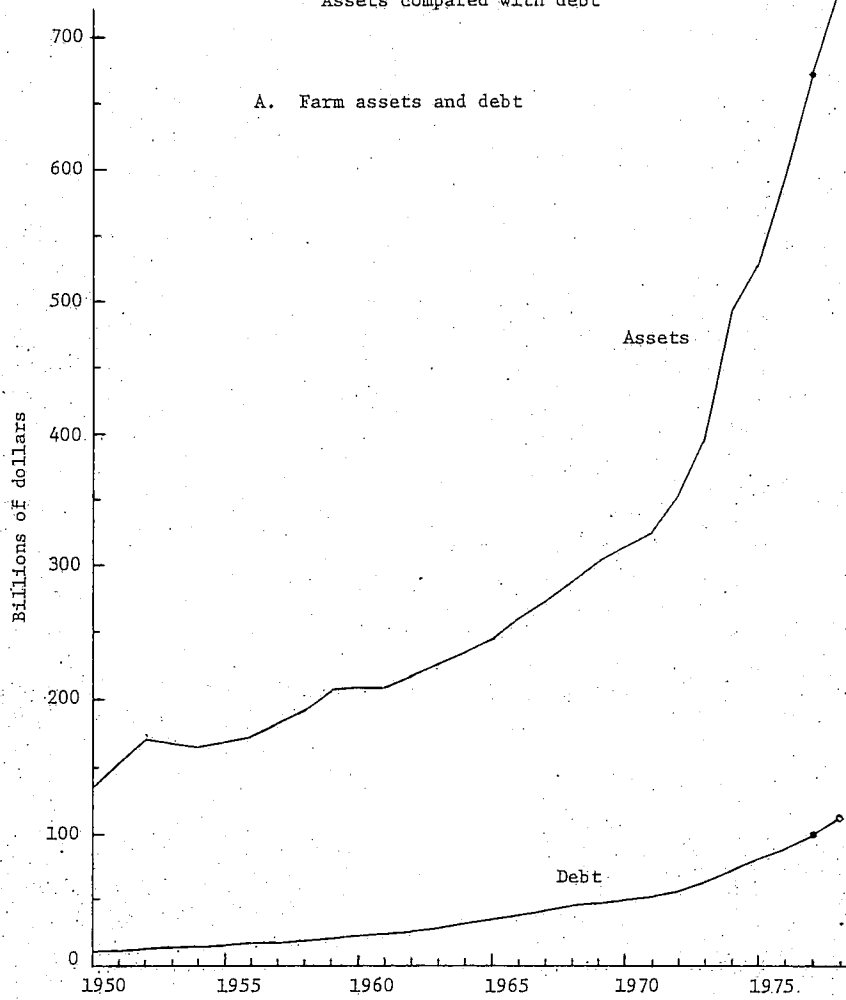
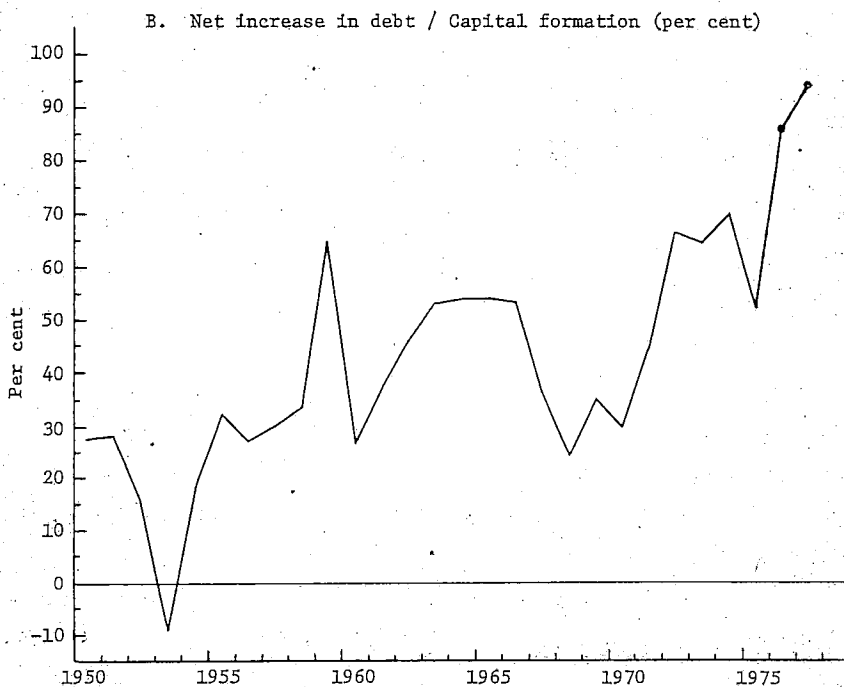
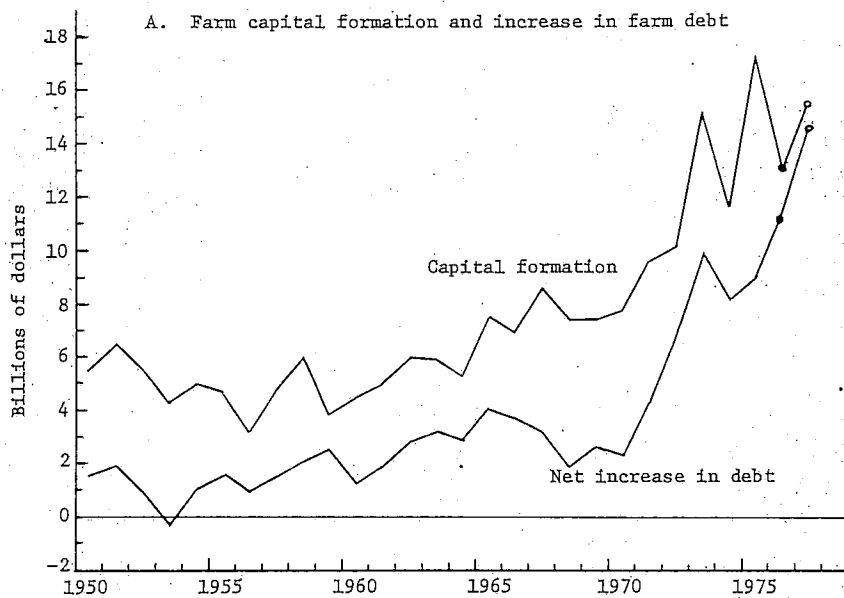


Chart 4

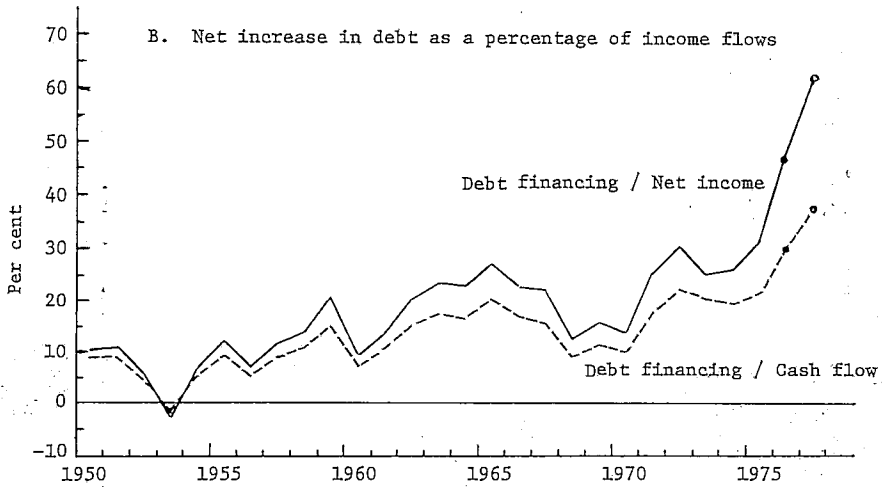
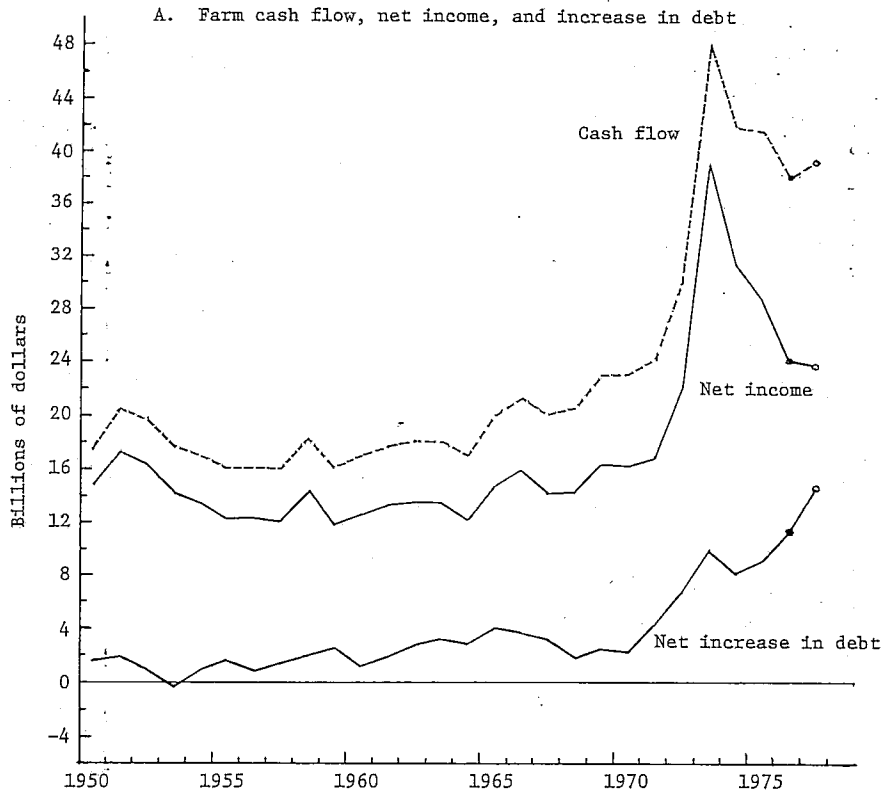
Debt financing compared with capital formation



Note: Capital formation consists of expenditures for machinery, buildings, and land improvements plus the net change in financial assets and in livestock and crop inventories.

Chart 5

Debt financing compared with income flows



Note: Cash flow is net farm income plus capital consumption allowances at replacement cost.

Table 1

Percentage of banks reporting a slower rate of farm loan repayments

Date of survey	Federal Reserve District				
	5 Richmond	7 Chicago	9 Minneapolis	10 Kansas City	11 Dallas
1972--January	-	12	18	-	-
April	-	6	12	-	-
July	-	4	7	-	-
October	-	3	2	-	-
1973--January	-	22	0	-	-
April	-	9	2	-	-
July	-	7	1	-	-
October	-	6	3	-	-
1974--January	-	6	4	-	-
April	-	8	6	-	-
July	-	27	23	-	-
October	-	28	35	-	-
1975--January	-	37	52	-	-
April	-	44	50	-	-
July	-	30	34	-	37
October	31	15	21	-	25
1976--January	21	21	31	34	28
April	20	18	42	31	21
July	0	15	35	26	15
October	11	19	60	56	28
1977--January	24	28	75	68	28
April	6	30	75	64	26
July	11	40	62	67	31
October	24	52	74	65	38

Source: Federal Reserve Bank surveys of agricultural credit conditions.

Note: In Districts 5, 9, and 11, respondents are asked to compare "current" experience with "usual" experience. In Districts 7 and 10, respondents are asked to compare experience during the past quarter with that of a year earlier.

Table 2

Percentage of banks reporting greater demand
for loan renewals or extensions

Date of survey	Federal Reserve District				
	5 Richmond	7 Chicago	9 Minneapolis	10 Kansas City	11 Dallas
1972--January	-	15	15	-	-
April	-	10	15	-	-
July	-	7	8	-	-
October	-	8	5	-	-
1973--January	-	26	4	-	-
April	-	14	6	-	-
July	-	12	5	-	-
October	-	8	2	-	-
1974--January	-	10	5	-	-
April	-	13	10	-	-
July	-	30	16	-	-
October	-	32	24	-	-
1975--January	-	41	45	-	-
April	-	51	45	-	-
July	-	33	41	-	47
October	28	19	24	-	35
1976--January	27	23	38	31	34
April	20	26	42	38	27
July	3	18	34	31	20
October	9	20	47	54	26
1977--January	29	34	69	66	33
April	11	34	64	66	35
July	14	45	55	69	31
October	30	56	61	67	44

Source: Federal Reserve Bank surveys of agricultural credit conditions.

Note: In Districts 5, 9, and 11, respondents are asked to compare "current" experience with "usual" experience. In Districts 7 and 10, respondents are asked to compare experience during the past quarter with that of a year earlier.

Table 3

Average loan/deposit ratio at banks surveyed
(Per cent)

Date of survey	Federal Reserve District				
	5 Richmond	7 Chicago	9 Minneapolis	10 Kansas City	11 Dallas
1972--January	-	54	58	-	-
April	-	54	58	-	-
July	-	55	60	-	-
October	-	55	59	-	-
1973--January	-	54	58	-	-
April	-	54	58	-	-
July	-	55	61	-	-
October	-	56	61	-	-
1974--January	-	55	61	-	-
April	-	54	63	-	-
July	-	58	63	-	-
October	-	57	65	-	-
1975--January	-	57	64	-	-
April	-	56	63	-	-
July	-	56	63	-	58
October	64	57	63	-	55
1976--January	60	57	63	56	54
April	61	56	63	57	55
July	64	58	65	59	58
October	62	59	66	62	60
1977--January	62	59	64	61	57
April	64	59	63	62	58
July	66	61	66	65	62
October	65	64	68	64	63

Source: Federal Reserve Bank surveys of agricultural credit conditions.

Table 4

Percentage of banks with a loan/deposit ratio that is higher than desired

Date of survey	Federal Reserve District				
	5 Richmond	7 Chicago	9 Minneapolis	10 Kansas City	11 Dallas
1972--January	-	17	13	-	-
April	-	14	12	-	-
July	-	19	13	-	-
October	-	14	6	-	-
1973--January	-	17	6	-	-
April	-	17	7	-	-
July	-	20	15	-	-
October	-	22	15	-	-
1974--January	-	20	15	-	-
April	-	17	11	-	-
July	-	27	27	-	-
October	-	32	39	-	-
1975--January	-	32	34	-	-
April	-	28	19	-	-
July	-	22	21	-	20
October	10	22	18	-	16
1976--January	9	23	16	37	17
April	6	20	16	34	15
July	15	24	26	39	19
October	9	25	26	51	26
1977--January	0	26	18	48	16
April	17	28	20	52	17
July	24	38	29	59	26
October	15	46	35	51	28

Source: Federal Reserve Bank surveys of agricultural credit conditions.

Table 5

Percentage of banks referring more farm borrowers
to correspondent banks

Date of survey	Federal Reserve District			
	5 Richmond	9 Minneapolis	10 Kansas City	11 Dallas
1972--January	-	6	-	-
April	-	5	-	-
July	-	6	-	-
October	-	2	-	-
1973--January	-	7	-	-
April	-	7	-	-
July	-	7	-	-
October	-	6	-	-
1974--January	-	5	-	-
April	-	4	-	-
July	-	9	-	-
October	-	7	-	-
1975--January	-	8	-	-
April	-	6	-	-
July	-	6	-	13
October	0	2	-	12
1976--January	3	6	19	13
April	0	5	18	11
July	3	10	16	11
October	3	8	21	18
1977--January	3	6	29	14
April	0	9	27	10
July	0	13	28	17
October	0	8	34	20

Source: Federal Reserve Bank surveys of agricultural credit conditions.

Note: Respondents in Districts 5, 9, and 11 are asked to compare "current" experience with "usual" experience. Respondents in District 10 are asked to compare experience during the past quarter with that of a year earlier.

Table 6

Percentage of banks referring more farm borrowers
to nonbank credit agencies

Date of survey	Federal Reserve District			
	5 Richmond	9 Minneapolis	10 Kansas City	11 Dallas
1972--January	-	5	-	-
April	-	8	-	-
July	-	3	-	-
October	-	2	-	-
1973--January	-	2	-	-
April	-	2	-	-
July	-	3	-	-
October	-	5	-	-
1974--January	-	3	-	-
April	-	2	-	-
July	-	6	-	-
October	-	19	-	-
1975--January	-	24	-	-
April	-	27	-	-
July	-	11	-	22
October	13	9	-	20
1976--January	9	16	26	18
April	13	13	20	13
July	3	12	19	7
October	3	14	25	9
1977--January	3	27	34	15
April	9	33	37	22
July	10	28	37	21
October	16	25	50	29

Source: Federal Reserve Bank surveys of agricultural credit conditions.

Note: Respondents in Districts 5, 9, and 11 are asked to compare "current" experience with "usual" experience. Respondents in District 10 are asked to compare experience during the past quarter with that of a year earlier.

Table 7

Percentage of banks actively seeking new farm loan accounts

Date of survey.	Federal Reserve District			
	5 Richmond	9 Minneapolis	10 Kansas City	11 Dallas
1972--January	-	67	-	-
April	-	69	-	-
July	-	68	-	-
October	-	72	-	-
1973--January	-	75	-	-
April	-	78	-	-
July	-	71	-	-
October	-	62	-	-
1974--January	-	69	-	-
April	-	76	-	-
July	-	46	-	-
October	-	27	-	-
1975--January	-	30	-	-
April	-	43	-	-
July	-	51	-	40
October	63	61	-	44
1976--January	62	62	58	49
April	71	63	51	51
July	59	54	51	50
October	65	55	35	45
1977--January	71	54	37	50
April	82	56	30	49
July	72	58	31	44
October	68	58	25	39

Source: Federal Reserve Bank surveys of agricultural credit conditions.

Table 8

Percentage of banks that refused or reduced a farm loan request
in the preceding quarter because of a shortage of funds

Date of survey	Federal Reserve District			
	5 Richmond	9 Minneapolis	10 Kansas City	11 Dallas
1972--January	-	4	-	-
April	-	5	-	-
July	-	2	-	-
October	-	2	-	-
1973--January	-	2	-	-
April	-	5	-	-
July	-	5	-	-
October	-	9	-	-
1974--January	-	6	-	-
April	-	4	-	-
July	-	18	-	-
October	-	35	-	-
1975--January	-	27	-	-
April	-	13	-	-
July	-	11	-	11
October	8	8	-	12
1976--January	3	5	13	8
April	3	7	14	7
July	3	9	11	7
October	0	10	20	13
1977--January	0	10	23	10
April	0	7	22	10
July	0	12	26	15
October	0	11	27	9

Source: Federal Reserve Bank surveys of agricultural credit conditions.