

FINANCING AGRICULTURE'S FUTURE--PROSPECTS AND PROBLEMS

Emanuel Melichar  
Board of Governors of the Federal Reserve System

June 25, 1971

A look into the financial future of agriculture is necessarily based on an analysis of past experience and of the forces that shaped that record. Projection of future trends and problems then becomes a matter of deciding to what extent the various factors that influenced the recent past are likely to continue into the future, and what new factors might arise. Though such efforts later often prove to have missed the mark, the analytical exercise itself is often enlightening and worthwhile. Thus I have approached my assigned topic in this fashion, rather than choosing to report the results of simply extending trend lines or to report the results that others have obtained by doing this. I think that you will find some of the thoughts and projections that come out of such analysis interesting and stimulating.

Let me first give you a brief statement of the broad results of the analysis. The following prospects and problems appear likely:

- 1) Both the amount of capital being used in agriculture, and annual capital flows that are required, will continue to increase significantly. My projection comes out at annual growth of around 4 per cent for both stock and annual flow, which would result in total growth of around 50 per cent over this decade.

arrangements, or may seek faster growth in effective bank size through merger, branching, or affiliation with holding companies.

Rural banks have been facing these problems for some time now and you have undoubtedly heard them discussed before--perhaps most often in the context of improving correspondent relationships and permitting banking structure changes. The panelists that follow me, I note, will be discussing other, and I think newer, strategies. In the remainder of this paper, I hope to provide some helpful insights into the circumstances and problems to which these strategies are addressed.

For over a decade, we have been in a period of rising annual farm credit demands. First, in the late 1950's, farmers reduced their savings rate and began to utilize more debt financing. Then, in the middle 1960's, we experienced coincident increases in the growth rates of practically all of the major types of farm capital requirements. We need to be aware of the factors responsible in each instance, to be able to make informed projections.

#### Real Estate Farm Capital Requirements

Real estate transfers. The standard discussion of capital requirements posed by farm real estate points to the increase in value and implies that this determines credit demands associated with ownership of land. This analysis is incomplete, however. For instance, if all farms were passed to heirs that stayed in farming, no capital flows or credit demands would arise regardless of what the land was valued at. Thus how much capital must be raised by agriculture to finance the transfer of farms from one generation, to the next really depends on such factors as how long each generation farms, how many farmers sell out and enter the nonfarm economy (either as workers or retired persons), and what proportion of the estates of farmers are inherited

by nonfarmers. Hardly any information is available on these factors, so my series on capital flows required each year to effect real estate transfers, shown in Chart 1, is based mainly on the value of real estate and on data showing the percentage of farms transferred annually.

The value of farm real estate in turn is virtually completely determined by changes in its price, because in recent years additions to farm land and land improvements have been largely offset by depreciation and land moving to nonfarm uses. As we all know, land prices have been rising significantly for an extended period. Chart 2 shows some of the factors thought responsible for this trend--first, the fact that the general price level has been rising; second, that technological developments have allowed (or forced) farmers to seek to enlarge their farms, so that this facet of demand for land has been very strong; and third, that technological improvements in crop production has been raising output per acre, and some of these gains in production efficiency are being capitalized into the price of land. Looking ahead, there is little reason to expect near-term diminution of these particular forces that are tending to raise land prices.

Machinery purchases. Though the value of machinery on farms is only a fraction of the value of real estate, the "turnaround time" is much shorter, and it turns out that capital flows for machinery purchases have lately been running about equal to those I estimate as required for real estate transfers. However, machinery purchases exhibit considerable cyclical quality, as shown in Chart 3. Analysts who looked only at the value of machine stocks on farms missed the fact that annual purchases, which represent the capital need, were in a downtrend during much of the 1950's before booming at an obviously unsustainable rate in the mid-1960's. We are now again in the downward phase of the machinery cycle. An important factor to

to think about in trying to predict the cycle is that even now machinery purchases are running between \$4 and \$5 billion annually. Though this is only enough to replace the equipment that wears out, it does permit a significant amount of updating to take place even while total purchases are stable or falling.

As Chart 3 also shows, a goodly portion of the rise in capital going into machinery purchases has been caused by a persistent, and lately an accelerating, rise in machinery prices. The course of these prices is determined largely by events in the nonfarm economy, and it seems that further increases should be expected, though hopefully at a much lower rate than those of the past two years.

Net additions to the physical stock of machinery occurred in the early postwar years and again during the 1960's. Using econometric techniques, I have found it possible to explain the course of both the physical stock and the USDA index of machinery inputs during 1950-69 as being due to the influence of the three factors shown in Chart 4. Changes in the amount of cropland under cultivation seem to have a small but understandable influence. More importantly, during this period, purchases and use of machinery have increased when machinery prices declined relative to farm wage rates--which was our experience during the 1960's. The statistical analysis also finds that increases in machinery use and stocks are associated with the decline in the number of farms. The key to this relationship may be that technological developments in farm machines permit enlargement of crop farms.

Additions to livestock inventories. Capital requirements for purposes other than land transfers and machinery purchases are decidedly minor, together accounting for less than a fourth of capital flow. Of these, I thought it best to give some attention to livestock, to ascertain why

capital requirements here have not been increasing as rapidly as one might suppose from looking only at livestock production or at the total value of livestock inventories. As Chart 5 indicates, livestock production has been rising fairly steadily; however output per breeding unit has increased even a little faster. Thus the number of breeding units, which represents a significant part of livestock inventories, has actually been in a slight downtrend.

Second, as Chart 5 also shows, the market value of livestock inventories has experienced severe cyclical fluctuations, most recently in a sharply upward direction, but these fluctuations have resulted primarily from price changes. A capital flow requirement arises only from physical additions to inventories, which have been more moderate. Of course, rising livestock prices raised the cost of making these additions, but the dollar amounts involved annually are far smaller than the large change shown in the market value of livestock inventories in many years.

Other capital requirements. Additional capital flows include expenditures for buildings and land improvements, which were in a downtrend until 1965, but since then have been rising probably because of higher prices for material and labor. The expenditures are plotted in Chart 6, along with my projection of a continued slow rise. As I have noted, the present volume of these expenditures is not resulting in net capital formation of this type, as the annual expenditures are now approximately equal to annual depreciation. Physical changes in farm inventories of stored crops, now worth about \$11 billion, are a source of severe fluctuations in annual capital requirements. There has been no particular trend in recent years, however, nor much reason to expect one to develop.

Changes in liquid working capital held by farmers were negative in the 1950's, but more recently an upward trend has developed. I include currency, demand deposits, time deposits, and U.S. savings bonds in my calculations. While rising prices and more use of purchased inputs should be tending to increase working balances, migration out of agriculture has undoubtedly tended to offset these effects.

As shown by Chart 6, I project that the sum of additions to inventories and money balances may rise by enough to average over \$1 billion annually around 1980. I expect that the largest components would be additions to cattle numbers and to time deposits. But these capital flows are so small relative to the total that even a major deviation from this projection would not exert much effect on total capital flow.

Projected capital flow. In marked contrast, it is readily apparent from Chart 6 that even relatively small percentage deviations from the projection for either machinery purchases or real estate transfers can cause a large "error" in the total capital flow projected. Any substantial change in the basic trend for either series would have profound implications for the credit projections that follow. The primary projections that underlie the capital flows shown are land price appreciation of 5 per cent annually, thought consistent with general price inflation of 2 per cent per year, along with real estate market pressures and activity associated with reduction in farm numbers from the present 2.8 million to 2.0 million by 1980; machinery price increases of 2.5 per cent annually, which was the average rate over 1950-1968; and physical additions to machine stocks at the rate of 1.75 percent per year, based on the reduction in farm numbers, a faster rise in wage rates than in machinery prices, and some increase in cropland being cultivated.

It seems equally important to note the pronounced effects that shorter-term cyclical variations, which appear most apt to occur in machinery purchases, can have on total capital requirements, and to try to keep these in perspective when they occur.

My estimate of total capital flow in 1970 is \$12.6 billion, and my projections of capital flows in 1980 sum to \$18.3 billion. This would be an increase of 45 per cent over the decade, or an average annual increase of 3.8 per cent.

#### Financing Capital Flows

The graph and projection of total capital flow is repeated in the middle of Chart 7, which examines how this flow has been and may be financed. There are two principal sources of financing:

- a) internal--from farmers' income flow-- and
- b) external--by additional borrowing, which increases outstanding debt.

As the chart shows, in the mid-1950's capital flows were largely financed internally, which has also been the case during most of the history of American agriculture. During those years, farmers were allocating just over a fourth of their total cash flow toward meeting capital requirements.

In the late 1950's, however, farmers reduced their saving rate, and it stayed around 22 per cent of total cash flow through the 1960's. Noticeably greater use of external financing thus became apparent in the late 1950's. Then, as capital flow requirements rose faster than cash flow during the 1960's, farmers financed the difference by borrowing rather than by stepping up their savings rate. About a third of the capital flow of the last decade was financed by increasing debt, compared to 12 per cent in the early 1950's. Such a degree of reliance on credit financing has been rare in the known financial history of American agriculture. The only previous period of such behavior occurred during the land speculation boom of World War I.

The annual increases in debt, past and projected, shown at the bottom of Chart 7, translate into the growth of total outstanding farm debt shown by Chart 8. It turns out that outstanding debt would grow by 7.0 per cent annually, for a total gain of 96 per cent over this decade. Outstanding debt would reach \$108.7 billion in January 1980.

A comparison of debt with assets is customary. Total assets that I have enumerated would be valued at \$442.4 billion in 1980 after rising by 51 per cent over the decade. The debt/asset ratio would rise from .189 to .246.

#### Meeting Credit Demands

Farm credit is provided by a variety of lenders, which I have found analytically useful to group into the four categories shown in Chart 8: sellers of farms, life insurance companies, rural commercial banks, and all the rest, which I refer to collectively as the "money market lenders." (However, Chart 8 deviates from this grouping by showing data for money market banks combined with data for other banks.) Trends in the amount of credit provided by each of these groups is affected by certain factors unique to that group.

The proportion of farm credit provided by sellers of farms can be expected to be directly related to the level of activity in the real estate market and to the trend in land prices. To some extent, therefore, we can anticipate an "automatic" adjustment: if capital requirements associated with land transfers rise faster than projected, so will the amount of credit that should be forthcoming from sellers of farms. An added factor is the relative attraction of farm mortgages or land contracts to retiring farmers for tax considerations and/or investment purposes.



Similarly, I isolate life insurance companies as a separate group because of the unique factors that determine the amount of farm credit they provide: first, the trend of and cyclical fluctuations in their cash flow, depending on policy premiums, policy loans, and repayment of loans previously made; second, the fact that for insurance companies farm loans, with their relatively short commitment period compared to that of commercial loans, are a "swing" investment area from which funds can be withheld when necessary to meet outstanding longer-term commitments in commercial and industrial lending; and third, the relative attraction of farm mortgages compared to other investments, in which insurance companies are increasingly seeking to obtain equity participation. If the companies continue their recent pattern of seeking out the higher-risk investments in which they can get equity participation (and it remains to be seen whether they will succeed in getting a "share of the action" in acceptable risks during periods when money is easier), they might choose to reduce their role in farm lending. Given the relatively low risk in farm mortgages while land prices are in an uptrend, the excellent access of the Federal Land Banks to the national money market, and the availability of credit from many sellers of farms, there presently appears to be no reason for farmers to give equity participation to an insurance company in order to get financing, except in special and probably speculative circumstances.

The situation of rural commercial banks somewhat resembles that of the insurance companies, in that these smaller banks also have limited control over their inflow of funds, which is pretty much restricted to the growth of local demand and time deposits. On the investment side of their ledger, they too must decide among farm loans, nonfarm loans, and money

market securities. However, banks have an incentive to favor local loans even when money market instruments yield a greater immediate return, as more local lending should improve local economic conditions and growth.

The "money market lenders" have in common their ability to obtain their loanable funds in the national capital and money markets, or from large banks that participate in those markets. The group includes the cooperative Farm Credit System (Federal Land Banks and production credit associations), the Farmers Home Administration, large commercial banks that can sell their liabilities in money markets, and farm supply corporations that extend trade credit to farmers and who are able to get money market funds either directly or by borrowing from money market banks.

These lenders, among which the dominant position is held by the Farm Credit System, are able to offer farm credit in amounts that are not restricted by the types of factors that I have listed as influencing the amounts that the other lender groups can make available to farmers. The price of this credit will closely reflect national money market conditions, and at times may be rather expensive. Within this restraint, however, the money market lenders provide agriculture with a very elastic source of credit, because agriculture's borrowings represent a small portion of the funds flowing through the money centers. For over a decade, through tight as well as easy money periods, money market lenders have been able to channel rapidly increasing amounts of funds into agriculture, as Chart 8 readily demonstrates. My projection of credit demands, representing a slowdown from the rate of that expansion, should present them with no problem. If the projection is too low, they should be able to make up the difference if the other lender groups do not. In an aggregate sense, the money market lenders are able to fill gaps created by either temporary or longer-term reductions

in the farm lending capability of the other lender groups.

Farm Lending Prospects and Problems of Rural Banks

If outstanding farm debt does increase by only 7 per cent annually as the projections I have presented indicate, and rural bank time deposits continue to grow anywhere near as rapidly as they have for a decade, banks on average would be able to maintain their relative role in farm lending without further increasing loan-deposit ratios, as long as they continued to allocate the present percentage of their loanable funds to farm loans. Whether they would choose the latter behavior would depend heavily on the relative strength of competing loan demands.

Within this average picture of the overall banking system, there would be many banks experiencing above-average farm credit demands because of local conditions. Entire regions may also experience such credit demands, perhaps even over extended periods. For these reasons, as well as to support growth of nonfarm lending in rural areas, it appears desirable that rural banks achieve, or be provided with, some of the fund-raising capabilities currently possessed by the larger banks and other "money market lenders."

Furthermore, the projections indicate that credit demands per farm may expand by 10.8 per cent annually over this decade, which means they would nearly triple by 1980. This is an old problem for rural banks, and one that seems unlikely to go away.