

Structure of the Capital Market and an Evaluation of Its Components

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THE EFFECTIVENESS of capital markets in serving agriculture will be evaluated in this chapter. This evaluation is made by directing attention to all of the capital used in or by agriculture, regardless of the specific form in which the capital happens to be momentarily. Thus, capital in the form of people and technology is just as important, for the purpose at hand, as capital in the form of land, buildings, and other items. This broad view of resource allocation as a capital problem is needed if, for example, gaps in the markets for capital are to be analyzed — a matter of more significance than determining how well the individual capital markets do what they are designed to do. The allocation of capital among alternative uses is the focal point of interest in evaluating the capital markets.†

The thesis of the author is that existing capital markets have not been, and are not effective in providing an adequate amount or an efficient use of capital in agriculture. This statement implies that we face the challenge of being creative, i.e., creative enough, and imaginative enough, to develop means, consistent with the goals of a free and progressive society, that will bring forth a reasonably adequate demand for, supply of, and allocation of capital to agriculture and the rest of the economy. This challenge falls into three interdependent parts. These parts concern the supply of capital in the aggregate; the efficiency of existing suppliers of capital; and the closing of gaps in existing capital markets.

DIMENSIONS OF CAPITAL NEEDS OF AGRICULTURE

The dimensions of the capital needs of agriculture are explored by asking: When and how much capital is employed in agriculture? The

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†It is hoped that the context in which the word capital and related terms are used will convey the meaning intended. It has been an interesting experiment to write this chapter on the assumption that an evaluation of the capital markets can best be made by treating credit problems as inseparable from capital problems, and by treating capital problems as a matter of the allocation of all resources. Thus, the appropriate yardstick to be used in evaluating the capital markets serving agriculture is the efficiency of the allocation of capital in agriculture.

first place to look for part of the answer to this question is in the Balance Sheet of Agriculture.¹ This source indicates that the total assets of agriculture on January 1, 1959, amounted to \$203.1 billion, divided as follows:

	<u>Billions</u>
Real estate	\$125.1
Livestock	18.1
Machinery and motor vehicles	18.4
Crops	9.4
Household furnishings and equipment	13.1
Deposits and currency	10.0
U. S. savings bonds	5.2
Investments in cooperatives	<u>3.8</u>
Total	\$203.1

What other capital is used in agriculture that is not accounted for in the Balance Sheet of Agriculture? An outside observer would find, upon careful examination, that many of the people working on farms are not listed on the Balance Sheet of Agriculture. However, after his initial surprise, this observer would find that these people, at least some of them, are entered on another sheet of paper called the Income Statement for Agriculture. On this statement he finds two entries, one with reference to farm operators, and the second labeled "wages to hired labor." After considerable effort to determine what, if anything, these people are worth, he comes to the conclusion that they must be worth more than the items listed in the Balance Sheet of Agriculture.

A close examination indicates that many roads, school buildings, dams, electrical facilities, etc., were not included in the Balance Sheet of Agriculture. Further examination reveals that a great deal of activity seems to be centered on bringing farmers various things that they use to produce food and fiber. In addition, there are other people who market the food and fiber produced by farmers. Little of the capital used in these activities is accounted for on the Balance Sheet of Agriculture. Thus, a balance sheet for agriculture, coming anything close to accounting for all the capital used, would not only need to count the items included in the Balance Sheet of Agriculture, but also the people, community, and marketing facilities. Martin, Mackie, Woodworth, and Fanning examine the human aspects and their environment in evaluating capital use and investment in agriculture in Chapters 4, 22, and 23.

A last item which might bother the outside observer is how to count the technological knowledge employed in food and fiber production since it has no value explicitly imputed to it. After careful consideration this, too, would be counted because people were willing to spend money to get new technology, and thus, it must be worth something,

¹ Balance Sheet of Agriculture, Agr. Info. Bul. 214, USDA, ARS, 1959.

even though it raises a question of double counting on the distribution side.² The dimensions of capital used in agriculture are so defined.

SOURCES AND DETERMINANTS OF THE SUPPLY OF CAPITAL USED IN AGRICULTURE

The capital employed in agriculture is examined with reference to sources, and the determinants of supply.

Sources of Capital

The sources of capital employed in agriculture will be examined in terms of: (1) capital accounted for in the Balance Sheet of Agriculture, (2) capital invested in people, and (3) all other capital embodied in items such as roads, technology, etc.

Balance Sheet of Agriculture. On January 1, 1959, the liabilities of agriculture amounted to \$23.3 billion, while proprietors' equities were listed at \$179.8 billion for a total of \$203.1 billion. The liabilities were composed of \$11.3 billion in real estate debt, \$2.5 billion Commodity Credit Corporation loans and guarantees, and \$9.5 billion of short-term debt. An examination of proprietors' equity on the asset side indicates that \$45.6 billion worth of real estate was rented, \$17.3 billion from other farm operators, and \$28.3 billion from nonfarm operators. Thus, the amounts of capital identified as to source were as follows:

	<u>Billions</u>
Real estate debt	\$11.3
Commodity Credit Corporation debt	2.5
Other reporting institutions debt	5.8
Non-reporting creditors	3.7
Real estate rentals	<u>45.6</u>
Total	\$68.9

The rental of capital in other forms is also found in agriculture. If these rentals amounted to 10 percent³ of the value of livestock, machinery, and stored crops (excluding crops with CCC loans), an additional \$4.6 billion of capital moved to farm operators through the capital markets. Thus a total of some \$73.5 billion of capital, on January 1, 1959, was borrowed or rented by farm operators. This amounted to 36 percent of the total assets listed in the Balance Sheet of Agriculture.⁴

² This capital need is normally not considered in analyses of this type because thinking is restricted to the confines of distribution theory. This is a mistake. Value and growth theory is also relevant in this context.

³ An estimate based on a Great Plains study. Balance Sheet of Agriculture, p. 12.

⁴ Some double counting is involved because landlords are not necessarily debt free.

Analysis of the allocation of this borrowed capital indicates that 45.5 percent of all real estate capital was borrowed, while 28.1 percent of all other capital, excluding financial assets, was borrowed.⁵

Capital invested in farm people. No attempt will be made to put an exact price on the heads of the agricultural population for several reasons, not the least being the problem of choice of method—cost of production; cost of replacement; earnings, discounted after maintenance and depreciation, in agriculture; possible earnings outside agriculture; and the like. It is clear that some 5 million farm families are involved and that the capital so invested in these people exceeds the amount accounted for in the Balance Sheet of Agriculture. Capital for investment in people comes largely from household income and government tax expenditures, through the provision of such services as education, health, and welfare. Martin presents data on these types of investments in Chapter 4.

Other capital invested in agriculture. Significant amounts of capital are used in agriculture for the development of new technology, community facilities, and the marketing of farmers' products and supplies. The capital used to support these activities comes from various sources. Support for the development of new technology is largely provided by government and the suppliers of inputs sold to farmers. Both private and public funds are used in financing community facilities. In these cases, most of the capital is supplied out of income, earnings, or taxes, though the credit and financial markets are sometimes the immediate sources of supply. In the case of firms engaged in the marketing of agricultural products or supplies, the sources of capital are similar to those generally available to businesses in other parts of the economy.

Determinants of Capital Supply

The supply of capital available for agriculture is examined with reference to the total supply of capital for the entire economy and in relation to the share of this capital that can be directed to agricultural uses.

Aggregate supply of capital. The determinants of the total amount of capital that a society is willing to hold, and of the increments it is willing to add to these holdings each year, are complex. A list of these determinants would include such items as income—including the total amount, changes, and its distribution; the structure of institutions; customs, the values of the people; interest rates. The major variable among these determinants in the short run is the interest rate or the price that people will be paid for the use of capital.

Little information is available regarding the price elasticity of

⁵ The 28.1 percent figure would be reduced had the \$19 billion of financial assets been included and the \$2.5 billion of CCC loans and assets been excluded. CCC loans are more nearly sales of commodities than regular indebtedness in the usual meaning of the term.

supply of savings in the aggregate.⁶ Two general types of information which bear upon this question are available. One type concerns the relationship between income and savings, while the other centers upon the differences in the behavior of people where the returns for use of savings differ. Both types of data suggest that the short run price elasticity of supply for savings is very low. The logic of this conclusion is fairly simple.

When income and its distribution and changes therein are related to savings and changes therein, significant relationships are observed. Thus, to the extent capital accumulation can be explained in terms other than the interest rate, the interest rate cannot be the explanatory variable. An examination of cross-sectional data shows that farmers and small businessmen save significantly higher percentages of (about double) their incomes than do other people of comparable ages in comparable income groups. These farmers and businessmen are also the people who have opportunities for obtaining the highest marginal yields on capital. Many farm operators can obtain marginal yields on capital of 50 to 100 percent per year. This same situation may well exist for many businessmen. For example, Schweiger reports that small manufacturing corporations in 1957 earned, on the average, at least 16 percent on net worth after taxes plus, probably, several percentage points accruing from understated earnings. He also indicated that the average return to capital "...tends to be much lower than the return possible on marginal capital."⁷ It can also be observed that small businessmen and farmers often fail to take advantage of cash discounts at an interest cost of usually 24 to 36 percent per year. Thus, if marginal yields on capital amount to between 25 and 100 percent and the percentages of income saved by people with these opportunities are double for these groups (unincorporated businessmen, 17 percent) compared with all urban units (12 percent) in the same income group (\$7,500 to \$10,000),⁸ and the yield on savings for the latter group is in the 3 to 5 percent range, fairly low price supply elasticities are suggested.⁹ Thus the capital markets appear to have little, if any, effect on the total supply of capital in the short run.

In the long run the situation may well be very different. The establishment of new credit institutions and of other enterprises, such as life insurance companies, may significantly affect the total supply of capital available to a society.

⁶ The concern here is with real savings, not with measures that result in encouraging the use of, for example, idle cash balances. This does have an impact on real saving through increasing prices or inducing other action to restrain prices, or through changes in the level of employment.

⁷ Irving Schweiger, "Adequacy of small business financing: another view," *Financing Small Business*, Part I, Vol. I, Background Studies, Federal Reserve System, 1958.

⁸ Figures in problem taken from Schweiger article drawn from the 1950 B. L. S. Wharton study.

⁹ These figures are at best only suggestive in that the same person will often have a savings account with a 3 or 4 percent return and yet borrow money on, for example, a car at perhaps 36 percent.

Share of capital available to agriculture. The supplies of credit available to agriculture from some lenders appear to be unlimited at going interest rates if the quality requirements of the lenders are met. There appears to be a general agreement on this point in Part III. Over time the supplies of credit also appear to be infinitely elastic, though interest rates, along with quality requirements, change. These changes appear to occur in step with the changes experienced by other borrowers. Thus the credit markets appear to be extremely effective and efficient in obtaining credit for farm operators from both local and national sources. This view is also held by Baughman and Wetmore in Chapter 12 and Engberg in Chapter 16. This evaluation should not be interpreted to mean that existing interest rates, quality standards, etc., do or do not make economic sense, but that, given the policies and traditions of lenders and the legal restraints under which they operate, they are highly efficient in obtaining credit for agriculture.

The noncredit capital markets for agriculture, largely concerned with rental agreements, are much more difficult to evaluate than are the credit markets. However, these markets seem to be fairly efficient in the specialized areas in which they operate. On the other hand, equity capital obviously is not available to agriculture in the forms that can frequently be obtained by nonagricultural firms.

THE SUPPLIERS OF CAPITAL TO AGRICULTURE

An evaluation of the effectiveness of the capital markets is made by focusing attention upon those institutions which supply capital to agriculture through credit and other means. Questions concerning these suppliers are centered upon the magnitude of their activity, their sources of capital, the parts of the capital market served, lending policies and practices, and the efficiency of their operations with respect to the costs of lending and the needs of borrowers.

The Suppliers of Credit

The relatively minor role that suppliers of credit play in supplying agriculture with capital is suggested by the data in Table 3.1. These figures, of course, tend to exaggerate the relative roles of these lenders since the Balance Sheet of Agriculture accounts for only a small percentage of the capital used in agriculture.

These suppliers of credit obtain the capital they provide to agriculture from different sources. The groups classed as individuals and others, and as commercial and savings banks, obtain their funds largely from local sources, while the Farmers Home Administration and the Commodity Credit Corporation obtain their funds largely from the Federal treasury in amounts determined by Congress. The Federal Land Banks and the Production Credit Associations obtain their funds

Table 3.1. Nature of Agricultural Credit Extension by Lenders

Type of lender	Percentage of all debt outstanding held by various lenders		Amount of debt outstanding held by various lenders as percentage of assets used in agriculture and accounted for on the Balance Sheet of Agriculture
	Farm mortgage debt	Nonreal estate debt	
Federal Land Banks	18.1	--	1.0
Farmers Home Administration	3.2	4.5	.4
Life insurance companies	24.5	--	1.4
Commercial and savings banks ^a	13.5	41.6 ^b	2.9
Individuals and others	40.7	36.0 ^c	4.2
PCA's and FICB's ^a	--	9.8	.5
Commodity Credit Corp., loans held	--	8.1	.4
Total	100.0	100.0	10.8

Source: Agricultural Finance Review, ARS, FERD, Washington, D. C., Vol. 21, July, 1959, pp. 121, 134, 135, 145. (Percentages calculated by author.)

^aIncluding CCC loan guarantees.

^bAll operating banks.

^cNonreporting creditors.

from national capital markets. The life insurance companies obtain their funds as a by-product of the sale of insurance. These latter agencies — the Federal Land Banks (FLB's), Production Credit Associations (PCA's), and the life insurance companies — as far as farmers are concerned, are able to provide unlimited amounts of credit. In other words, the supply of credit may be treated as infinitely elastic from the point of view of borrowers, as long as the lenders' quality standards are met. The rationing of funds by these agencies is on a quality basis, almost exclusively, rather than on a price basis. The supply of credit provided by banks and individuals cannot normally be thought of as infinitely elastic; therefore, it is rationed on both a price and quality basis.

Federal Land Banks. The portion of the market the Federal Land Banks stand ready to serve is, and traditionally has been, restricted to high-quality real estate mortgages. Their quality standards have been such that their loss rates have been negligible on loans made since the Great Depression. Loss rates for the period of 1917 through 1940 never exceeded 1 percent of outstandings and have averaged about one-half of one percent of outstandings (Table 3.2). Loss rates since 1940 have been lower than those in the earlier period.

A further indication of the quality of Land Bank loans can be gained by an examination of the loss experience of the Federal Farm Mortgage Corporation. Many second mortgages were made on Federal Land Bank first mortgages as well as first mortgages involving more risk than the Land Banks were permitted to take. Losses of the Federal Farm Mortgage Corporation on cumulative outstandings amounted to only 0.42 percent for the 1933-40 period, and 0.57 percent for the

Table 3.2. Federal Land Bank Loss Rates, 1917-1940

Year	Cumulative losses to end of year as a percentage of cumulated year-end outstandings ^a	Annual losses as a percentage of year-end outstandings
(Percent)		
1929	0.13 ^b	0.42
1930	0.16	0.40
1931	0.21	0.60
1932	0.27	0.95
1933	0.29	0.52
1934	0.29	0.26
1935	0.84	0.70
1936	0.38	0.73
1937	0.41	0.76
1938	0.46	0.93
1939	0.49	0.94
1940	0.51	0.80

Source: R. J. Saulnier, Harold G. Halcrow, and Neil H. Jacoby, *Federal Lending and Loan Insurance*, Princeton University Press, Princeton, N. J., 1958.

^a Losses also include: throughout, charge-offs of principal and interest on mortgage loans; from 1935 through 1937, net increases in valuation reserves maintained against farms owned outright or in process of acquirement; and from 1938 on, net increases in valuation reserves covering both loans and real estate transactions. Losses are given net of recoveries from national farm loan associations resulting from their endorsement of loans.

^b From year of organization, 1917.

1941-51 period. Another measure of the high quality of Land Bank loans is suggested by their appraisal and lending policies. Since the Great Depression their lending policies have been tied to appraisals based on normal agricultural value. In terms of the current purchase prices of the properties, it has been unusual for the farmer to close a loan with less than a 50 percent equity. Thus, the Land Banks have restricted their lending to the low-risk portion of the market.

The cost of borrowing from the Land Banks in terms of interest and service charges, not necessarily income foregone by the borrower through a restriction on the amount borrowed, has been less than for most other lenders. The second form of leadership shown by the Land Banks is in the length of loan. Land Bank loans have traditionally been for much longer periods than those of any other lenders with the exception of certain subsidized loans of the Farmers Home Administration. The efficiency with which the Land Banks have performed their job, in terms of costs per dollar loaned or outstanding, leaves little to be desired. In fact, their long-term record has been improved in recent years.

Life insurance companies. The segment of the market served by the life insurance companies more nearly overlaps that of the Land

Banks than is the case with any other lenders. The major differences between the two are that the life insurance companies restrict their lending to the less risky types of agriculture, usually on a geographical basis; require less equity on the part of borrowers; charge interest rates slightly higher than the Land Banks; make loans of a larger average size and for shorter periods. They, too, have had negligible loss rates on loans made since the Great Depression. The loss record of the life insurance companies was higher than that of the Federal Land Banks during the 1920's. This resulted, in a large measure, from the fact that they made a sizable number of mortgages on the basis of World War I prices and expectations. The Land Banks were just getting organized during this period, and consequently had lower losses than otherwise would have been the case.

Insurance companies have been highly efficient in providing agriculture with credit. The service charges are reasonable by any standard applied. In fact, the farm mortgage departments of life insurance companies usually return a net yield somewhat less than the departments making home mortgages.

Production Credit Associations and Federal Intermediate Credit Banks. The market served by the PCA's and the FICB's overlaps that served by commercial and savings banks in the nonreal estate market. Loans by the PCA's can be for periods up to five years, though in general the terms are much shorter. The PCA's grant loans that are significantly larger on the average than comparable bank loans.¹⁰

The quality of PCA loans has been high. Their loss rates have been favorable as compared with the losses of national banks and country national banks.¹¹ (Table 3.3). These data suggest that the PCA's serve the well-established farmers, though these data alone are not inconsistent with other conclusions. No detailed data are presented on the lending costs of the PCA's, though their record of efficiency is also outstanding.

Bank lending. Loans to agriculture by the banking system involve the extension of both real estate and production credit. Many serve the real estate market in a double role. They originate mortgages which are later sold to insurance companies and others. They also grant mortgages which they hold in their own accounts. In the nonreal estate credit markets, the banks' outstanding loans amount to over 40 percent of the market; thus, they serve several times as much of the market as the PCA's and FICB's. There is little reason to believe that the operating costs of these lenders are out of line and that they are anything other than highly efficient in both their real estate and nonreal estate lending activities.

Commodity Credit Corporation and Farmers Home Administration. These government agencies provide special credit services to agriculture. The credit operations of the CCC are a by-product of the

¹⁰ Saulnier *et al.*, *op. cit.*, Table 34. (See Table 3.2, this volume.)

¹¹ *Ibid.*, Table 38.

Table 3.3. Comparative Loss Rates of All National Banks, Country National Banks, and Production Credit Associations, 1936-1950

Year	Total losses of all national banks ^a	Net losses of country national banks ^b	Net losses of PCA's ^c
	(Percent)		
1936	1.87	1.37	0.68
1937	0.82	0.48	0.28
1938	0.95	0.42	0.88
1939	0.74	0.33	0.46
1940	0.58	0.31	0.22
1941	0.44	0.16	0.14
1942	0.42	0.05	0.12
1943	0.43	0.15	0.12
1944	0.36	0.22	0.06
1945	0.21	0.19	0.03
1946	0.26	0.12	0.06
1947	0.34	0.06	0.10
1948	0.21	0.10	0.11
1949	--	0.18	0.22
1950	--	0.09	0.08

Source: Saulnier *et al.*, *op. cit.*, Table 38. (See Table 3.2, this volume.)

^aCalendar-year losses (before deduction for recoveries) as percentage of December 31 outstanding.

^bFor 1936 and 1937 fiscal-year losses as percentage of June 30 outstandings; thereafter, refers to calendar-year losses and December 31 outstandings. Except for 1936 and 1937 (when banks in 14 to 21 cities with less than three banks are included), the data are restricted to national banks other than those in reserve or central reserve cities.

^cActual plus estimated net losses for calendar year as percentage of average of month-end balances, with the 1949 and 1950 losses of taxable PCA's adjusted for the "general provision for undetermined losses."

government price-support program. The nonrecourse loans and loan guarantees of the CCC are in general more in the nature of income than of borrowing. The FHA operates several credit programs, none of which are directly competitive with programs of other lenders. These programs were originally intended to be a means of filling one of the capital "gaps" in agriculture — that of providing credit to farmers who could not get credit elsewhere to establish reasonably efficient farming units. Borrowers were also provided with farm management services of a nature private lenders normally do not, and likely cannot, provide. Woodworth and Fanning, Hopkin, Engberg, Diesslin, Tootell, and Shepardson indicate in following chapters that such services are now being offered by private lenders, and the great need for expanding this assistance is prudent business and offers remunerative returns.

The programs of the Farmers Home Administration have tended to shift in purpose, becoming similar to regular credit operations and losing their original purpose of aiding in the development of efficient farm firms. Murray presents a different viewpoint in Chapter 11.

FHA losses have varied widely among the various FHA programs. However, its record for low losses and low operating costs is impressive to even the most economy-minded persons when recognition is taken of the nature of the programs that were implemented.

Individuals and others. Individuals and others supply 4.2 percent of the capital, accounted for in the Balance Sheet of Agriculture, used by farmers. This amounts to almost 41 percent of all real estate credit and 36 percent of all nonreal estate credit.

The sectors of the market that individuals and others serve include low equity real estate loans and the financing of equipment, feed, and other items. No adequate picture is available, for the entire country, of how these credit suppliers fit into the capital markets serving agriculture.

All suppliers of credit. An evaluation of the performance of the groups supplying credit to agriculture reveals that they provide about 11 percent of the total capital used in agriculture accounted for in the Balance Sheet of Agriculture. These groups effectively and efficiently serve the sectors of the market they try to serve. On the other hand, most lenders simply are not equipped to provide capital to agriculture on terms required to achieve an optimum allocation of capital. They often leave unserved such capital needs that cannot be adequately secured in terms of marketable assets. Thus, from the point of view of an optimum allocation of capital, there is little likelihood of a situation being realized where the costs of credit will come close to equaling the marginal returns from the use of credit.

Other Suppliers of Capital

The noncredit sources of capital used in agriculture can be largely traced directly to (1) various types of rental arrangements and (2) retained earnings along with gifts, inheritances, and capital gains. Capital originating from these sources passes through and is influenced by the capital markets in varying degrees. The major question posed is: How effective are the capital markets in bringing about an optimum use of the capital originating directly from these two sources?

Capital provided through rental agreements. The rental markets for agricultural land and other inputs are generally local and of great variety. Raup deals with this subject in greater detail in Chapter 9. The connections among these markets are indirect and exist through the national credit markets serving agriculture and the investment alternatives open to the people owning and renting these inputs. The capital provided to farm operators through rental agreements presumably must meet capital needs that are qualitatively different from the needs met by the national institutional lenders since their supplies of credit are infinitely elastic.

An evaluation of the efficiency of rental contracts involves many considerations, though two seem to be of major importance, viz.,

(1) a farm operator is usually able to obtain more capital through rental agreements than in any other way, and (2) the difficulty of designing a rental agreement for the parties involved to share production costs and outputs in ratios that will lead to farm firms organized with maximum efficiency. The efficiency with which capital is allocated through the rental markets can in part be evaluated by inference, subsequent to noting several trends.

Since the pressure for increases in the size of farms is great, the renting of farms could be expected to increase. However, this has not occurred. Thus it appears that the disadvantages of renting must have outweighed the potential efficiency. Moreover, even if the decrease in farm tenancy occurred as a direct result of relatively high farm incomes during and following World War II, the fact remains that most farms are less than the optimum size.

Capital provided through retained earnings. Most of the capital used in agriculture has been acquired from the earnings of farmers, including capital gains, along with inheritances and gifts. Spitze presented data on this subject in Chapter 2. A complete analysis of how efficiently these assets are used would need to include a consideration of both household and firm problems. At one extreme the position is taken by some that since people use their capital in the way they do by their own free choice, an optimum use of the capital, all things considered, must exist. While this view has its own logic, it ignores the existence of imperfect knowledge, markets, and the like, and further assumes away the resource allocation and equity problems flowing from accidents of birth, luck, etc. This situation does not exclude the possibility or the desirability of changes in capital markets or other institutions that will lead to a more efficient allocation of capital without any loss of freedom by farmers to do just as they please with their capital. This opportunity is an important part of the over-all challenge.

ADEQUACY OF THE CAPITAL MARKETS FOR AGRICULTURE

The capital needs of agriculture are examined from the standpoint of (1) the needs of individual farm firms; (2) the need for investment in people; (3) the needs of firms marketing agricultural products and supplies; (4) community needs; (5) the need for accumulating capital in the form of new technology; and (6) the needs of the agricultural industry as a whole.

Individual Farm Firm Needs

Numerous studies indicate that most farms in the United States — both commercial and low-income — are of less than the optimum size and/or are out of balance with respect to their capital-labor ratios. Thus, most farm operators are underemployed, secondary to

(1) unrealized economies of scale and/or (2) a shortage of capital relative to labor, a matter of variable proportions.¹² In cases where underemployment of labor is secondary to unrealized economies of scale, other inputs are also underemployed.

Elimination of underemployment of the first type requires more inputs of all types in individual firms, while correction of the second type of underemployment requires more capital or less labor in the farm firm.¹³ These problems have not been solved through the efficient operation of the capital markets. Moreover, existing capital markets likely offer little hope of meeting these problems — a conclusion suggested by the long period over which these underemployment problems have existed, and reinforced by new technology being developed for use in agriculture (cf. Chapters 14, 22, and 23). Thus it is concluded that existing capital markets have failed to come close to bringing about agricultural firms that either are of optimum size or that use the proper proportions of various inputs.¹⁴

Capital Needs for Investment in People

The amounts of capital needed for investment in people will vary depending on the tests of need applied. If people in agriculture are considered as only economic inputs with no mobility, and thus no alternative use, then the amount of capital invested in them is excessive. It is also likely true that agriculture would be more efficient if the existing capital in people were concentrated in a smaller number of people. By this measure of need, more resources are being devoted to the health, education, etc., of rural people than is justified.

If the assumption of immobility is relaxed, an inadequate amount of capital would seem to be invested in rural people. However, it would be economical to make additional capital investments in only those people who would be shifted to an alternative employment and in only the minimum amounts required to shift them. By this test of need, more capital should be invested by the local community in people in only those special cases where the marginal value product of rural people to the members of the community is negative; or by lenders only when it represents the most profitable investment alternative; or by the state or nation if a transfer of these rural people will contribute to the interests of the larger community by an amount greater than would any other investment of the required capital. Chapters 23 and 24 deal with this problem in greater detail.

¹² The third type of underemployment, secondary to an overexpanded industry, would exist in pure form if all agricultural firms were of optimum size, using inputs and producing outputs in optimum ratios.

¹³ The logical alternative of reaching an optimum capital-labor ratio through a reduction in the amount of labor used in individual farms will seldom be appropriate because of the scale problem.

¹⁴ Studies of the causal factors of why farmers use too little capital often reveal an unwillingness by farmers to use credit that is available. Thus, the problem is that of changing farmers' attitudes and/or changing the terms, etc., on which capital can be obtained.

If rural people are considered as more than economic inputs or as ends, in an equalitarian society, the appropriate test of need for capital investment in people is changed. By this test the usual welfare criteria apply, and there seems to be little doubt that more capital should be invested in rural and nonrural people.

Existing capital markets have not achieved adequate investment in people, nor do they appear likely to do so in the future. The reasons are several. First, people are "free" and cannot be bought, sold, or mortgaged as can other economic inputs. Thus the lenders of capital would have little security. This fact alone means the capital markets cannot operate effectively in this area. Since the usual capital markets cannot meet this need, most capital investment in people must come out of household income, either directly or indirectly, through taxation. This situation has not been brought about, nor does it seem likely to bring about, an adequate supply of capital for investment in people.

Agricultural Marketing Firm Needs

The conclusions regarding the effectiveness of the capital markets in bringing about an optimum use of capital in agricultural marketing are not as clear-cut as is the case with individual farm firms and people. Two facets of this question are of interest, viz., that which concerns the scale and variable proportions problems within marketing firms and that which concerns the number and capacity of such firms in the aggregate.

One evidence of an ineffective allocation of capital to agricultural marketing firms is the fact that farmers own sizable equities in agricultural marketing cooperatives. Since many individual farmers are inadequately supplied with capital and yet find it profitable to invest in marketing cooperatives, supplies of capital may be inadequate for this type of marketing firm. On the other hand, private marketing firms and individuals provide most of the inputs purchased by farmers and market most of the outputs produced by farmers. These firms, of great variety and size, have access to the same capital markets as other comparable businesses, which suggests no special problem in agriculture. This fact suggests that if a reconciliation is attempted, the capital markets serving nonagricultural industries will prove to be as inadequate in bringing about an optimum amount and use of capital as are the capital markets serving agriculture.

Little information is available for evaluating the extent to which capital markets have progressed in supplying adequate capital to all marketing firms serving agriculture. However, if these marketing firms were optimally organized, one would probably find that a more than adequate amount of capital has been allocated to this sector of economic activity. Thus, the problem, to the extent it exists, may well be an oversupply of capital to all such marketing firms in the aggregate but an undersupply to individual firms.

Community Capital Needs

People engaged in farming, as well as others living in rural areas, place demands upon the supply of capital as members of a group distinct from their individual needs. These capital needs are classified into three types: (1) demands by local government; (2) demands for resource development, of types exemplified by some programs of the Department of the Interior and the Rural Electrification Administration; and (3) needs for the development of new industry in low-income agricultural areas. Sizable capital outlays are required for consumption, production, and capital accumulation to provide services to the members of a community.

Local government needs. Capital requirements are primarily for roads and education. Local outlays for education — capital investment in people — can be used to illustrate a part of the capital problem in agricultural communities. Investment in education tends to increase underemployment for two reasons. First, resources devoted to taxes will decrease the amount of resources available for use by farm firms, and second, at a later date the capital requirements of optimum-sized firms will increase secondary to a new generation of more able farm operators. This, however, is not the end of the story, since higher levels of education will tend to increase labor mobility, thus setting the stage for the movement of people from agricultural to nonagricultural employment. Underemployment of the third type (secondary to an oversized industry) will then be decreased.

The flow of capital into education is almost exclusively determined by the incomes of the members of the community, yet the yield from such investments is likely negative in its correlation with community income. Therefore, capital investments by community groups are not likely to be allocated among communities in anything close to an optimum pattern. Nor, given existing capital markets, does it seem likely any significant improvement can be made. As a whole, existing capital markets are unable to cope with this type of capital need. This conclusion is similar to Mackie's in Chapter 22.

Community resource development needs. These needs have been met historically by many blends of private and government activity. At one extreme is the direct government program where the funds have been provided by the federal government, e.g., the Rural Electrification Administration; at the other extreme are the private endeavors. Between these extremes are a great variety of programs involving differing amounts of public aid, such as land grants to the railroads, federal credit programs, and the like.

Any attempt to evaluate whether too much or too little capital has been directed into programs of these sorts would be a major undertaking. This is an area where the private capital markets can play an important role, especially when varying types of federal loan insurance and loan guarantees can be employed.

Capital needs for new industry. These needs reflect an opportunity

to increase efficiency by moving employment to people rather than by moving people to employment. That such opportunities are available is not a question of doubt. The real questions are how much, in what places, at what rates, and by what methods shall capital be invested in new industries. It is clear that the capital markets have not operated in the past to prevent the problem of bypassed low-income communities. The extent to which existing capital markets can meet this type of problem is not so clear. Perhaps the question of greatest interest centers on the measures that can be taken to make the capital markets more effective in bringing about an adequate total supply and distribution of capital to ameliorate this type of problem.

Needs for New Technology

The capital devoted to the development of technology employed in agriculture is generally recognized as highly productive. In fact, the income woes of agriculture are now quite commonly ascribed to the high rate of technological development (cf. Chapters 6 and 7). This view is correct in a superficial way in that an absence of modern agricultural technology would increase the prices of agricultural commodities. In a meaningful economic sense this view is incorrect because it implicitly assumes no alternative use for other agricultural inputs.

The amount of capital allocated to the development of technology is either excessive or inadequate, depending on the yardsticks employed. It is excessive if we consider how primitive the technology of food production should be, assuming no outward mobility of inputs used in agriculture, if returns to people employed in agriculture are to be similar to that earned by others in nonagricultural employment. On the other hand, assuming perfect mobility of agricultural inputs, the flow of capital to the development of technology has been inadequate in the past. An adequate evaluation of the extent to which capital needs of agriculture for the development of new technology are being met requires, in addition to the usual costs and returns calculations, analysis of the costs of increasing input mobility, especially people. Such an analysis would indicate an inadequate accumulation of technological capital and an inadequate flow of capital for the development of new technology.

Agricultural Industry Capital Needs

The total capital need of agriculture is examined with reference to two measures of capital need, viz., (1) capital requirements for the production of adequate supplies of food and fiber, and (2) the over-all problem of an efficient organization and structure for agriculture.

Capital needs for an adequate supply of food and fiber. Given the existing supply and demand for food and fiber, the amount of capital

used in agriculture is more than adequate. This is an implication (by definition) of existing agricultural surpluses, since a surplus in a meaningful economic sense can exist only when the allocation of resources is excessive in the sector of the economy under consideration.¹⁵ To the extent that surpluses exist, the capital markets have not operated in a way to bring about an allocation of capital to agriculture in an optimum total amount.

Capital needs for an efficient agriculture. Assuming that changes were to be made so that the optimum number of firms would be in agriculture, that each firm would be of optimum size, and that each firm would employ inputs and produce outputs in optimum ratios, major changes would be required in the allocation of capital. These changes in capital allocation would require shifts within agriculture and between agriculture and the rest of the economy. The exact picture of an agriculture in equilibrium cannot be specified, nor is such an exact specification needed in this context. This much of the picture seems clear and useful for the purposes at hand: (1) fewer people would be employed in agriculture, though the amount of capital invested in each of these people would be increased; (2) most land would continue in use since its alternative uses are few; (3) improvements on land, except for the housing of farm people whose numbers would decrease, would likely increase; and (4) the use of capital in other inputs would increase. Thus, the major adjustment requirement within agriculture is that of increasing the average size of farms, while the major need between agriculture and the rest of the economy is a transfer of people out of agriculture.

Major gains in the efficiency with which capital is allocated requires, in addition to the movement of people out of agriculture, increased amounts of capital on terms not now available and for purposes not being met. The new terms must be such that potential marginal yields from the use of capital will serve as the major rationing principle rather than tests such as equity ratios. This problem is most likely as difficult to solve on the demand side as on the supply side of the market, as is evidenced by farmers' reluctance to borrow even when marginal yields are high. Methods must also be worked out so that more capital will be available in adequate amounts for such neglected purposes as investment in people, the development of new technology, resource development, etc.

When answers to this challenge are being sought, likely first places to look will include methods whereby (1) the total supply of capital can be made responsive to changes in demand, (2) gaps in the capital markets can be closed, and (3) greater efficiency can be achieved in the operations of individual suppliers of capital. This is a major challenge, probably one that cannot be met by existing capital markets.

¹⁵ This seems to be the level of sophistication at which people are thinking when they suggest fewer resources should be devoted to the development of new technology, that credit or education should be restricted, etc.

Discussion

IVY W. DUGGAN*

In determining capital needs of agriculture, Brinegar includes not only the capital items in the Balance Sheet of Agriculture, but also adds capital embodied in people, community facilities (such as schools, roads, and dams), marketing facilities, technology, and certain activities centered in bringing farmers various items used to produce food and fiber. He carries these non-Balance Sheet items all the way through his discourse, which makes it difficult for this discussant to comment on them briefly and devote adequate time to the discussion of capital items in the Balance Sheet.

People reared and educated on the farm have required income that would have been used in other ways had they been reared and educated elsewhere. Investment in the numbers of people who have left the farm has drained capital away from agriculture. The cost of rearing and educating the children of workers in a textile mill is paid for from the income of the workers and is not capitalized in the mill capital. Also, to an increasing degree, many of the states are collecting more taxes for education from the general public and allocating the funds on a pupil — or similar — basis. The capital embodied in people is considered in greater detail in Chapter 22.

The assembling, transporting, warehousing, processing, and distribution of food and fiber are not generally performed by the farmer. Businesses carrying on these activities are important and require capital, but, with the exception of cooperatives, farmers generally have little, if any, capital invested in them. The same holds true for the businesses supplying farmers with inputs used in agricultural production.

The remainder of this discussion is confined to the structure of the capital market for agriculture as an industry and primarily the commercial farms in the industry. Also, pertinent remarks will be confined to only the items included in the Balance Sheet of Agriculture. The Balance Sheet of Agriculture includes the capital of part-time, low-income, and subsistence farmers. However, I would assume that the capital of the commercial farms represents a rather high percentage of the total capital accounted for in the Balance Sheet.

Sociologically, subsistence and part-time farmers and nonfarm rural people are important, but their hope of betterment is mostly outside of commercial agriculture, as indicated in Chapters 14 and 22. These people contribute little to the agricultural industry.

In the second paragraph, Brinegar states "...that existing capital markets have not been, and are not effective in providing an adequate

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amount for achieving an efficient use of capital in agriculture." It appears that capital markets have contributed to the sharp reduction of manpower on farms from 1910 to 1959. At the same time, total output has almost doubled. During this period, farms increased in acreage and intensity of cultivation, and there was a rapid increase in the use of mechanical power and machinery, fertilizer, and other purchased inputs. This subject is developed in Chapters 6 and 7. Capital allocation contributed to all of these changes. Of course, research, education, and technology made their contribution to the dynamic changes that took place.

Productive gains in agriculture compare most favorably with the most progressive industries in the country. Efficiency in agriculture has increased for a number of years at a rate in excess of 2 percent a year. While capital is important, it appears that Brinegar overemphasized the role of capital in bringing agriculture to optimum efficiency and in achieving optimum allocation of resources (including people) within agriculture.

I am not too concerned about the lack of "know-how" in marketing capital, and especially credit. If the profits are high and if the risks are not too great or even supposed not to be, suppliers of credit will find ways of marketing their services. When banks were ultraconservative, they wanted little of the consumer credit business or installment loan business. In the meantime finance businesses have grown up all over the country and some have become national in scope. Banks are competing intensely to put personal loans and installment loans on their books, as demonstrated by the ads in newspapers, on radio and television, and in mailed literature.

Banks formerly contended that such loans were too expensive to make and serve, and that they were too risky. They have found that installment loans are more profitable than some of their other business. If the profit is there, someone will learn how to get it and will take the risks involved.

Let us return to the question of the importance of capital allocation to and within agriculture. Capital is drawn by conditions in an industry; it does not make the conditions. Rate structure design for public utilities, tariff laws, tax laws, price supports in agriculture, and fair trade laws all affect anticipated income and profits, which in turn affect the amount of capital which will be made available.

Institutional lenders are extending to agriculture types of credit which they did not extend only a few years ago. Some may be indirect, as in the case of integration. Large amounts of credit are supplied to feed mills which, in turn, extend credit to broiler producers. Broiler production in Georgia increased from 500 thousand birds in 1935 to 303 million birds in 1959. The two most important factors contributing to this increase were the capital and management supplied by the integrator. Integration will probably continue to have even more effect on allocation of capital to and within agriculture. This subject is covered more fully in Chapter 8.

It appears that Production Credit Associations and other suppliers of short-term credit are giving more weight to earning prospects and less to security offered than they have in the past. However, there are some indications that commercial banks are not going as far as Production Credit Associations.

As Brinegar stated, most of the capital used in agriculture has been acquired from the earnings of farmers, including capital gains, along with inheritances and gifts. Farmers, as a group, are willing to save a larger portion of their earnings than other groups. It is likely that farmers will continue to acquire a rather large proportion of equity capital from retained earnings in the future.

It would seem that improving the allocation of short-term credit to commercial agriculture in order to meet future needs should not be too difficult, provided farmers can earn reasonable returns on their labor, management, and capital. Improving the allocation of long-term credit will probably be more difficult. One way that might be worthy of exploration would be to extend the length of mortgages or move in the direction of permanent farm-mortgage debt and smaller annual payments, as suggested by Diesslin in Chapter 13. Of course there are other ways.

Improving the allocation of equity capital may be even more difficult. Inflation, partly due to overallocation of capital to land, that has resulted in high land prices compared with returns on land; the over-expansion of the agricultural plant in relation to present effective demand; the accumulation of surpluses; the declining farm income; the large amount of operating funds required in farming today; the drain on capital by children leaving the farm; and the settlement of the estates of farmers are all problems that evidently are not easily solved. It is to be hoped that the land-grant colleges, the Farm Credit Administration, the insurance companies, and others will carry on much additional research regarding equity capital allocation to and within agriculture.

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Brinegar's discourse deals with an evaluation of the structure of the capital market relative to our present and future needs. It starts with an inspiring challenge to be creative and imaginative in developing means of meeting our capital problems. It concludes by stating that the existing capital markets have not been effective in meeting these needs, but disappointingly turns to the "people with an interest in capital markets to carry leadership in meeting this challenge." This understates the responsibility and role of agricultural economics research in the land-grant colleges and the U. S. Department of Agriculture.

Chapter 3 is thorough and rigorous with respect to the framework within which it analyzes the sources, suppliers, and needs of capital in agriculture. By confining the analysis within the framework of long-run

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equilibrium and by retaining a relatively high degree of aggregation, however, Brinegar excludes many important operational questions. The conclusions about the role that credit can play in agricultural adjustment problems is, I think, significantly different as well.

Capital needs are measured against the requirements of a complete equilibrium adjustment in the long-run sense. In the long-run equilibrium sense, we can accept the conclusion that "the major adjustment requirement within agriculture is that of increasing the average size of farms, while the major need between agriculture and the rest of the economy is a transfer of people out of agriculture." If we shorten the time period to the life span of those people now engaged in farm production, however, I feel we would reach different conclusions as to what can be done. This problem is then approached from the starting point of the existing situation of resource availability and use in agriculture. From there one proceeds into a relatively large number of categories of farmers classified according to their potential opportunities.

We can expect a continued, if not more rapid, increase in the average size of farm within the so-called commercial sector of agriculture. But people can be expected to move out of agriculture primarily as young people are discouraged from entering farming, or we might say, by failing to replace the loss of operators through retirement and death. A secondary movement will occur, of course, as people currently employed in agriculture enter nonfarm employment, either directly or through part-time farming, but this opportunity is limited by the age and training of the farm people involved. Even if direct movement of underemployed people out of agriculture were not limited for these reasons, we could not expect to create the several million additional new jobs that would be necessary to employ all people who could be released from agriculture. In dealing with the adjustment problem, then, we need to recognize the fact that a large portion of the people who are now underemployed in agriculture are going to make changes within a rather restricted context. In some areas the low-income group is a very significant portion of the total farm population. The quantity of capital needed by this group is not large, but the manner in which it is made available is very important.

Looking at the problem from this point of view, the challenge is to create economic opportunity for people now underemployed in agriculture. To be consistent with the total requirements of adjustment, these opportunities must be considered in four general areas: developing economic-sized farm units, moving into completely nonfarm opportunities, transitional or partial movement to nonfarm opportunities through part-time farming, and what might be called a salvage or rehabilitation operation for those who are restricted from the first three. The role of credit in this approach to adjustment has been defined in the concept of development credit.

While the creation of economic opportunity is the defined essence of development credit, it usually involves some method of providing

management along with credit to assure the achievement of potential productivities and to permit loans to be based primarily on future productivities rather than on present equities. Both of these components are recognized by Brinegar, but are not brought effectively to bear on the role of credit in agricultural adjustment.

If this alternative standard of reference is used in evaluating the job being done by suppliers of credit, loss ratios, interest rates, and efficiency of internal administration become quite secondary measures of effectiveness. In fact, these measures in many cases have been kept to "high quality" standards through conservatism, which restricts economic opportunity. Many pioneers among commercial bankers and the Federal Land Banks tend to lend by conservative standards. The Production Credit Associations in some areas are also more reluctant to offer development credit even though they have a field staff to service such credit ventures. They have, instead, significantly expanded so-called high quality loans by picking up accounts receivable from farm supply businesses. On the other hand, the Farmers Home Administration and its predecessors, from the time of relief and rehabilitation loans of the 1930's through development and expansion loans of the 1940's to adjustment loans in 1959, have created superior economic opportunity for those whose security does not meet commercial standards. Their role in development credit certainly cannot be measured by their percentage share of the total credit market alone.

The pioneering venture of the Farmers Home Administration has shown that the idea of development credit can work. Lenders and agricultural economists should be equally concerned with methods of applying this valuable experience in developing a completely commercial service that will give all farmers the benefit of what has been learned. This is largely a matter of how to incorporate management assistance with credit in an effective working package. This problem is not a simple choice between the slow but sound method of farm management education, on the one hand, and the quick but less desirable method of contract farming, on the other. The subject is developed more fully in Chapters 11 and 23.

It is encouraging to see rental agreements treated as another source of agricultural credit in a broader context of resource acquisition, much as was done by the late Professor Hibbard in his work on credit and leasing. The conclusion that leasing or rental arrangements are not now serving as an effective means of resource acquisition is difficult to refute although the percentage of farms held by lease may bear little relationship to the function being performed by leasing in resource acquisition. The fact that leasing is discarded immediately as an effective means of resource acquisition characterizes a common restriction of effective opportunity arbitrarily imposed by the researcher. This, in fact, concedes that because leasing has not performed an effective function it will not do so. One of the major challenges in the field of resource acquisition and resource allocation lies in changing these institutions to enable them to serve the requirements of an economically adjusting agriculture.