Chapter 2

Determinants of Capital Formation—Conceptual and Factual Considerations

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A GOOD UNDERSTANDING of the capital and credit problems in a changing agriculture is secured through a recognition of the determinants of its capital formation. The purpose of this chapter is to provide a conceptual and factual background for the capital formation process in American agriculture against which the specific research findings and problems of farm capital acquisition will be subsequently explored.

This presentation has been divided into three sections: (1) a review of the meaning of capital and the process of capital formation; (2) identification of the sources of farm capital and an examination of the relative importance of these sources; and (3) a brief description of the problems considered to be of primary importance in the farm capital formation schema, considering the above theory and experience, and in connection with some current research.

PROCESS OF CAPITAL FORMATION IN AGRICULTURE

Meaning of Capital

Used in production. Probably the most common definition of capital is, simply, a tool of production. Such a meaning is concise and communicable; furthermore, it appropriately designates one of the prime characteristics of capital, namely, the use of something in production. There is little confusion about this definition except with reference to aggregations of assets. At times an accumulation of financial assets or of unused stores of equipment are included in a tally as capital. To be sure, both are savings, but savings are not synonymous with capital. Herein lies the basic fallacy of mercantilism.[1]

The differentiation between capital and financial assets is relatively simple, but a separation of unused capital goods from true capital is difficult, particularly at the firm level. Suffice it to recognize here,

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[1] Thomas Mun, "England's treasure by foreign trade," reprinted in Masterworks of Economics, L. D. Abbott (ed.), Doubleday & Company, Inc., Garden City, N. Y., 1947, p. 26.

however, that substantial amounts of unused goods in the form of land, equipment, and buildings on the farms across this nation, though considered wealth, never really enter the wealth-producing stream as capital, and hence contribute nothing to raise a depressed level of living. Thus, the simplified definition of capital (tool of production) does imply the important characterization of use in further productive effort.[2] On the other hand, it also erroneously implies that all capital takes a physical form to be used by the hand of, but apart from, man; furthermore, it leaves the origin of capital untold. Capital does not seem to have a distinctive form, but rather is distinguished by purpose of use.

Some useful differentiations are included in the following portion of an outline designed to identify capital:

I At the most general level, phenomena are either human or nonhuman environment.
  A. Within this environment, phenomena are either economic (used for satisfying man) or those not presently useful.
    (1) Within economic phenomena, goods and services are either produced by man's efforts or not produced (such as the sun's radiation).
      (a) Within produced goods and services — if indeed further delineation can be made — items are used for consumption, or for further production, namely CAPITAL. Its form is not distinctive.

Results from past production. A re-examination of the traditional tripartite factors of production as either land, labor (including management), or capital is in order. First, why was land separated from capital? Possibly the heritage of the ancestral physiocrats was too strong. If all wealth rises from the soil like geysers erupting from the bowels of the earth, then indeed, land has a distinct logical category. But is land any more distinct from capital as a factor of production than is livestock?

Land, as used since the beginning of farming, has been a produced good — produced by the endless human toil of discovery, combat against hostile elements, claiming, clearing, preparation, and painstaking improvement. Even the "free" distribution of land in the homestead grants was in recognition of such effort as one of the conditions for title. Thus, perhaps the last vestige of physiocracy should be wrested from production theory and land should take its place as an integral part of a capital base, subject to the same economic principles of acquisition and use as other capital goods.[3]

But what is the line of demarcation between labor and capital? Is capital always a physical good in the hand of labor or management?

[2] Probably recognized in true perspective first by E. V. Bohm-Bawerk in his Positive Theorie des Kapitals. See English translations in S. H. Patterson, Readings in the History of Economic Thought, McGraw-Hill Book Co., Inc., New York, 1932, pp. 353-78.

[3] Alfred Marshall, Principles of Economics, 8th ed., Macmillan & Co., Ltd., London, 1946, Book IV, p. 144.

Certainly these are crucial contemporary issues in capital theory which need clarification. A related theoretical dilemma plagued political economy for years – namely, the labor theory of value representing labor as the sole source of economic value. Remnants of this postulate may still survive to confuse the above question.

The traditional distinction between capital and labor is apparently a recognition of the "natural class" differences between human and non-human elements, a difference not so clear in the production process. In addition, the traditional distinction between consumption and production, or investment, is whether an economic good or service goes the route of direct human use or the route of use in a production process. Perhaps a more accurate representation of consumption is maintenance of labor and management.

A unique part of consumption vital to both labor and management is knowledge, both technological and general. Knowledge certainly originates from past productive effort, and is indeed used to further production. Improvement in knowledge is hardly mere maintenance; labor and management could continue at a given level of production without it. One important means for improving the productivity and level of living of many farm people is that of their learning about capital use and production technology, alternative skills and jobs, and even political and social organization (cf. Chapters 4, 22, and 23). These uses of past production for improved labor and management, though commonly termed consumption, seem clearly to possess the afore-identified characteristics of capital.[4]

Saved from consumption. A recognition that the raison d'etre of production (or income) is partly consumption leads to a final prime characteristic of capital, namely, a rescue of past production from consumption. If all production is consumed (used for maintenance), the chances for capital formation are negligible. Economic goods not so consumed are indeed saved from consumption, but all goods saved do not become capital. At both the micro- and macro-levels, saved production can terminate in deterioration, obsolescense, or nonuse.

A definition of capital proposed. Could a working definition of capital for these discussions on capital problems of agriculture now be hazarded? Capital is produced goods and services saved from consumption (maintenance and direct satisfaction of man) and used by, or as a part of, the human agent in further production.[5] The difficulty of separating the use of goods and services as consumption for labor and management on one hand and as capital (education) for improvement in the agent on the other is again emphasized. However, this distinction

[4] M. Abramovitz, Resource and Output Trends in the United States Since 1870, Occasional Paper 52, National Bureau of Economic Research, 1956.

[5] The combined meanings of capital as offered by two contemporary theorists approximate this definition though each seems to leave out an important and different aspect. K. E. Boulding, Economic Analysis, Revised ed., Harper & Brothers, New York, 1948, pp. 654f; P. A. Samuelson, Economics; An Introductory Analysis, 3rd ed., McGraw-Hill Book Co., Inc., New York, 1955, pp. 40f.

seems vital enough to the future economic well-being of the farm population to advance it. To consider improvement in the human agent as capital seems most functional when the investment is made by a firm, by individuals for themselves, or by the general public. Such expenditures for children by a family or local government seem impossible to handle functionally except as consumption for maintenance, discharge of responsibility, and enjoyment.

Capital formation itself can be viewed as either net or gross. Though all capital is product saved from consumption and used in further production, an important portion of it replaces each time the previously existing capital that has been "used up," has depreciated, or that has otherwise lost its value as a productive agent. Thus all savings actually being transferred into productive use are considered gross capital formation; that portion of the gross capital which adds to the total value of the capital base is net capital formation.

Capital Formation Process

The level of capital formation in an economy, as now defined, is dependent upon certain processes: production of goods or services (for both direct enjoyment and as intermediate products); an excess of such production over consumption (savings); and utilization of this saved product in further production (investment).[6] A failure at any stage can thwart the capital formation process. A closer examination of certain segments of the capital formation process is presented below so as to secure a better understanding of the farm capital problems.

Savings process and the farmer. Generally, production or income can be viewed as terminating in either consumption or savings.[7] They are complements for each other. The relevant question, then, is: What determines the size of either? Few questions have plagued the economic theorists more. However, the preponderance of evidence seems to point to consumption as the independent element – a propensity to consume. What is not consumed is savings, a residual.[8] Numerous factors, such as (1) expectations of future price levels and earnings, (2) cultural heritage, and (3) past experience of consumption, affect this tendency to consume, but probably the dominant factor is the level of income or production. Viewing the relation of individual earning and spending units, the higher the income, the smaller the proportion of income

[6] The effort here is not to offer a complete, thoroughly integrated, and fully documented theory of capital formation; such far exceeds the needs of, or space allotted to, this discussion. It might be simply indicated that the following factors, in addition to amount of capital, affect production: quality of original resources, level of knowledge and technology, values of population, stability of socio-politico-economic system, and historic chance.

[7] A third alternative is public taxation and expenditure which can affect the level of economic activity and, hence, capital formation. However, production and income here are exclusive of taxes, over which the private sector, individually, has little control.

[8] J. M. Keynes, General Theory of Employment, Interest, and Money, Macmillan & Co., Ltd., London, 1936, Books I and III.

consumed. So much income is "needed" to maintain labor, management, and family replacements and to achieve the current socially acceptable level of living; only then do affluency and excess income appear.

Thus, farmers' potential for capital formation or savings is substantially influenced by their levels of income. Farmers' incomes are low by comparison with most other producing units in the economy, as has been pointed out in Chapter 1. Low income not only hampers the formation of capital goods, but also that capital which takes the form of education and technology. What is most surprising is the magnitude of the capital formed in agriculture in spite of the dearth of savings potential. This herculean feat among farmers calls for a modification in the usual concept of the propensity to consume. Evidence points to a tendency of lower consumption by farm earning units at given levels of income when compared with nonfarm families.[9] Due to divergent values, unique social environment, or perhaps investment and replacement obligations, farmers' decisions on allocation of income result in a higher savings rate. However, it is doubtful that such a practice can offset the low levels of farm income. Agriculture may well have to look to nonfarm sources of saved production for a part of its needed future capital.

Availability of savings to agriculture. A second aspect of the capital formation process important to agriculture is the availability of savings for use as farm capital. Savings must precede capital formation, but it does not follow that the investor must be the source of savings. The saver may be unwilling or unable to use his savings for capital, yet willing to allow others to use these savings if paid for foregone liquidity and for risk. The separation of saver and investor is much less prevalent in farming than in the urban, industrial economy. The savings of nonfarmers are certainly a potential source of farm capital. Furthermore, during the life cycle of the farm family, the period of highest capital needs coincides with the period of highest consumption needs and lowest income. Conversely, as savings accumulate over the period of active farming, the possibilities for profitable use of increasing capital diminish.

Existence of uncommitted savings within or outside the farming segment, however, does not automatically guarantee its availability to the farm operator. Apart from the question of the comparative marginal net productivities of capital in farm and nonfarm use, which is beyond the scope of this analysis, there is the vital question of the route that attracted savings must travel to get to agriculture. The saver and farm investor could negotiate directly; yet the relative isolation of the farm operator from the mass of potential lenders certainly reduces the availability of savings to the farmer as compared with the urban entrepreneur. Of course, this is the purpose of financial institutions — banks, insurance companies, and finance corporations.

Until recently, institutional credit sources have tended to be urban

[9] Agricultural Statistics, 1951, USDA, Washington, D. C., p. 599; Statistical Abstract of the United States, 1953, U. S. Dept. of Commerce, Washington, D. C., p. 290.

in location, ownership, and outlook. Even farm savings not invested directly, such as those of older farmers, must be channeled to other farm users via these same urban businesses. Furthermore, the rapid emergence of the mutual fund and industry-wide retirement program may well tend to carry savings even farther from agriculturally-oriented institutions. The availability of either farm or nonfarm savings to supply the future capital needs of agriculture is restricted to the extent that the credit institutions are (1) not readily accessible in location, (2) unfamiliar with the individual farmer's enterprises and organization, (3) unduly fearful of farming risks, or (4) unwilling to arrange loan terms suited to the needs of farming.[10]

The investment effort and the farmer. Capital is not formed until savings are transformed into productive goods. This third phase of the capital formation process raises another question pertinent to agricultur Will the farmer seek out and invest all of the credit that might be profitably used in combination with his labor and management?

The saver prefers to keep his funds in a safe but liquid form, unless he can get a return commensurable to the degree of nonliquidity and risk coincident with lending. However, the payment required to satisfy this desire does not appear to be very high for normal investment outlets. For the borrower to be able to appropriate the savings with some given cost, there must be (1) knowledge about the role and use of credit in an enterprise economy, (2) understanding of the production process to be used in employing the additional capital, (3) possibility of enhancing net productivity enough by the use of borrowed capital to cover its cost, the risk, and a minimum desired margin of added income (affected by effective demand for a product), and (4) willingness to accept the uncertainty and any stigma attached to indebtedness. Only when these conditions of lender and borrower are fulfilled will capital be formed.

Aside from the question of the marginal value productivity of capital in farming today – overshadowed by inelastic product demand, underemployed labor, inflated factor costs, and other issues beyond the scope of this analysis – a relevant concern is the adequacy of farmers' knowledge and necessary credit decisions for actual capital formation in agriculture. This important problem is discussed further in Chapters 15, 16, 20, 21, and 23. To the extent that farmers do not consider credit to be a satisfactory tool of production, that their knowledge of credit source and use is deficient, and that their beliefs about indebtedness, risk-bearing, and good management are incompatible with credit expansion, farm capital formation can certainly be thwarted. Even farmers' beliefs about the merit of education and personal enlightenment can affect the expenditures made to better the educational opportunities for their children (cf. Chapters 4 and 22). The credit and capital problems in agriculture may well be shortcomings in farmer demand rather than deficiency in credit supply.

[10] H. G. Diesslin, "Effect of urban and industrial development on agricultural finance," Jour. Farm Econ., Vol. 40, Dec., 1958, p. 1149.

Research, technology, and inheritance. Capital formation generally follows the trail-blazing path of research and new technology. Since consumers derive less satisfaction from additional units of given goods and services, a prerequisite of any continued increase in production and capital formation is the creation of new goods and services. Furthermore, since demand for the farmer's product is highly inelastic both price- and income-wise, more inputs are hardly needed except for population growth. Thus, a substantial portion of new farm capital resulting from research and technology is substituted for labor. Capital formation in agriculture will be allied closely with the withdrawal of a plentiful labor supply to other uses.

A final consideration important to the capital formation process in agriculture relates to two characteristics of an enterprise system. Whatever levels of capital accumulation are achieved by the previously explored process tend to be perpetuated by the inheritance process. No generation begins at the same point; in fact, inheritance looms large as the dominant source of farm capital. Such perpetuation of capital levels also affects further capital formation. An enterprise system tends to return value for productivity not only to the human factor, labor and management, but also to capital goods. Hence, a farmer's total income is enhanced somewhat in proportion to the extent of his inherited capital, thereby further bolstering savings out of which new capital can be formed. Divergent capital holdings among farmers may well become fixed, if not further magnified, over time.

SOURCES OF CAPITAL AND ITS FORMATION IN AGRICULTURE

Capital formation in agriculture can be examined in two ways, each with merit, namely: (1) the aggregate capital structure of all farms; and (2) the capital formation process for the individual farmer.

Aggregate Farm Capital Formation

Probably the most complete research undertaken on this subject was recently completed by A. S. Tostlebe for the National Bureau of Economic Research. The data contained in this publication will serve as an empirical basis for the discussion that follows.[11]

The data in Table 2.1 indicate the magnitude of total farm capital used over the years. The total farm capital in 1950 — measured by physical assets of land, buildings, implements and machinery, livestock and poultry, and crop inventories — reached the impressive value of $107 billion.

Effects of inflation. A substantial proportion of the increase over

[11] Alvin S. Tostlebe, Capital Formation in Agriculture: Its Formation and Financing Since 1870, Princeton University Press, Princeton, N. J., 1957.

the years is attributable to the changing price level, most specifically to the highly inflationary forces since 1940. During the period of 1910-14 to 1950, $53.7 billion of the current value of farm assets, or exactly one-half, were added by the inflated price level alone (Table 2.1).

Table 2.1. Total Value of Physical Farm Assets, United States, Census Years 1870-1950 (billions of dollars)[a]

	1870	1880	1890	1900	1910	1920	1925	1930	1935	1940	1945	1950
Prevailing prices	11.9	13.4	17.5	21.8	43.3	83.8	60.7	60.5	40.4	43.9	75.0	107.4
Constant prices (1910-1914)	19.8	27.8	33.7	40.3	45.4	49.8	48.0	49.2	47.2	48.6	51.4	53.7

Source: A. S. Tostlebe, Capital Formation in Agriculture: Its Formation and Financing Since 1870, Princeton University Press, Princeton, N. J., 1957, pp. 54, 66.
[a] Physical assets include land, buildings, implements and machinery, livestock and poultry, crop inventories.

In aggregate terms, it could be concluded that inflation is a means by which agriculture can acquire its capital base since the price index of farm land — as one important indicator of farm asset value — increased more over the above 40-year period than the general price level.[12] However, this gain can be somewhat illusory for the individual farmer, since the gains of one generation via inflation must be paid for by the next generation in higher initial cost. Perhaps some of the gain is retained by farmers in the inheritance process. Furthermore, farmers could gain through inflation if all their debts were incurred in periods of depressed prices and paid off in subsequent booms. Unfortunately, this does not seem to be the case. Substantial borrowing by farmers during the 1900 to 1920 period had to be repaid during the depressions of the 1920's and 1930's, or was liquidated through foreclosure resulting in capital loss to the individual.[13] An appreciable amount of the borrowing during the late 1930 to early 1940 period worked to the advantage of farmers as a result of inflation after World War II.

Land grants a source. What was the source of the real capital (1910-14 prices) base of $53.7 billion held by farmers in 1950? One important source of this farm capital was the acquisition of large portions of the public domain via homesteading, "squatters' rights," special grants, and purchase directly or indirectly from grantors at low prices.

Approximately 13 percent of the total land area of the United States, or 21 percent of the land in farms (in 1954), was homesteaded subsequent to 1870.[14] Hence, the total farm physical assets in 1900 (valued at $40.3

[12] Historical Statistics of the U. S., 1789-1945, GPO, Washington, D. C., 1949, p. 231; Economic Report of the President Transmitted to the Congress, January 1960, GPO, Washington, D. C., 1960, p. 196; The Farm Real Estate Market, USDA, Oct., 1959, p. 28.
[13] Tostlebe, *op. cit.*, pp. 136-39.
[14] B. H. Hibbard, A History of the Public Land Policies, The Macmillan Co., New York, pp. 396-402; Agricultural Statistics, 1956, USDA, Washington, D. C., 1957, p. 426.

billion, 1910-14 prices) were largely the result of the productive effort of the entire economy in acquiring the public domain, and of the effort of the pioneering generations in wresting the resources from their native state and former users.

Savings from gross income. This still leaves unexplained the $13.4 billion increase in real farm capital from 1900 to 1950. Aggregate data indicate that the major portion of this farm capital was derived directly from savings out of prevailing net farm income. The role of farmer personal savings as a source of capital becomes even more convincing when gross capital formation over the entire 1870-1950 period is examined. Not only was there a $33.9 billion increase in real farm capital during these 80 years (1910-14 prices), but at least an estimated additional $57.7 billion of capital went into depreciation for farm buildings and machinery. Of this combined gross capital formation, an estimated seven-eighths came from the farmers' own gross savings, while one-eighth came from credit.

Limitations in the aggregate data analyzed here could result in an underestimation of the importance of certain phases of the farm capital formation process. These data represent net changes in the capital goods category between census periods. Capital uses or transfers completed within a year, or even between census periods, may not be evident in the data; certainly these are substantial. Furthermore, credit may be used and repaid within the census period without being included in the compilations of credit use.

It is of increasing importance that farmers are using more supplies and services — largely of nonfarm origin — within a production period or portion thereof, e.g., fuel, insecticides, insurance, electricity, fertilizer. Such items are not included in the aggregate capital data as physical assets, yet they are capital used to further the production of farmer labor and management.[15]

Changing composition of farm capital. Although net capital is still being added in farming, the rate of growth has declined considerably. Only $8 billion accrued to the real value of physical farm assets (1910-14 prices) in the 40-year period from 1910 to 1950, while over three times that amount was added in the previous 40-year period. However, changes in the relative importance of various types of physical assets have characterized this century (Table 2.2).

The dominant shifts in the farm capital structure are the increasing importance of implements, machinery, and other livestock relative to land, buildings, and workstock. Shifts in composition of farm capital vary by region, as is indicated for the Appalachian and Corn Belt regions in Table 2.2. The relative shift toward implements and machinery is

[15] Tostlebe refers to these as "intermediate products" rather than capital, *ibid.*, Chap. 7. However, Leftwick suggests, "Specific examples [of capital] are buildings, machinery, land, available mineral resources, raw materials, semi-finished material, business inventories, and any other nonhuman tangible items used in the productive process." R. H. Leftwick, The Price System and Resource Allocation, Rinehart & Company, Inc., New York, 1955, pp. 4-5.

Table 2.2. Percentage That Various Types of Farm Capital Are of Total Physical Assets, by Current Prices, 1870-1950, United States and Selected Regions

Physical Assets	1870	1880	1890	1900	1910	1920	1925	1930	1935	1940	1945	1950
						(Percent)						
United States:												
Land and buildings	78.1	76.3	76.0	76.3	80.4	79.1	81.5	79.1	81.4	76.6	72.8	70.1
Implements and mach.	2.8	3.0	2.8	3.5	2.9	4.3	4.4	5.5	5.3	7.0	8.3	12.0
Livestock and poultry	13.8	13.5	15.3	13.8	11.3	10.1	8.3	10.7	8.6	11.7	11.9	12.0
Horses and mules	5.3	5.3	7.3	4.3	6.1	3.3	2.6	2.3	3.5	2.9	1.3	.5
Other	8.5	8.2	8.0	9.5	5.2	6.8	5.7	8.4	5.1	8.8	10.6	11.5
Crop inventories	5.3	7.2	5.9	6.4	5.4	6.5	5.8	4.7	4.7	4.7	7.0	5.9
Appalachian:[a]												
Land and buildings	76.7	77.4	76.7	76.9	77.1	76.2	80.7	79.4	79.8	78.8	73.3	72.0
Implements and mach.	2.3	2.6	2.5	3.3	2.9	3.8	3.9	4.2	3.9	4.9	7.0	11.6
Livestock and poultry	14.5	12.4	14.0	12.1	12.6	10.7	7.6	9.8	9.5	10.7	10.3	10.0
Horses and mules	6.9	5.9	7.6	5.3	7.9	4.8	3.4	3.3	5.0	4.8	3.2	1.3
Other	7.6	6.5	6.4	6.8	4.7	5.9	4.2	6.5	4.5	5.9	7.1	8.7
Crop inventories	6.5	7.6	6.8	7.7	7.4	9.3	7.8	6.6	6.8	5.6	9.4	6.4
Corn Belt:[b]												
Land and buildings	79.7	77.5	77.4	79.3	83.4	82.8	83.5	80.1	80.9	76.8	72.1	69.2
Implements and mach.	2.7	2.8	2.5	2.6	2.2	3.6	3.5	4.6	4.7	6.3	7.8	11.1
Livestock and poultry	12.5	12.3	14.4	11.8	10.1	7.8	7.3	10.1	8.2	10.3	11.5	11.4
Horses and mules	5.0	4.9	7.2	3.6	5.5	2.2	1.9	2.1	3.2	2.1	.7	.2
Other	7.5	7.4	7.2	8.2	4.6	5.6	5.4	8.0	5.0	8.2	10.8	11.2
Crop inventories	5.1	7.4	5.7	6.3	4.3	5.8	5.7	5.2	6.2	6.6	8.6	8.3

Source: Tostlebe, *op. cit.*, pp. 54-55.
[a] Appalachian region includes: Tennessee, Kentucky, North Carolina, Virginia, West Virginia, Maryland, Delaware.
[b] Corn Belt Region includes: Iowa, Missouri, Illinois, Indiana, Ohio.

slightly greater in the Appalachian region than in the Corn Belt region, even though there is greater underemployment of labor in the southern area. Could the desire for machinery as "consumption" goods (prestige), and could the vulnerability of the less educated Appalachian farmer to sales promotion be channeling available capital into implements and machinery faster than its net productivity warrants? The shifts in livestock capital are also of interest. In spite of the trend in the Appalachian region toward more livestock enterprises, the data strongly suggest that such a change has not been as rapid as that taking place in other regions.

Other changes associated with capital growth. Dramatic changes in agriculture have taken place in farm labor and farm product-output simultaneously with the building of the farm capital structure. During the 1870 to 1910 period while the growth rate of physical farm assets was high, units of farm labor and farm output also increased rapidly. Subsequently, different forces seemed to take hold. Major physical capital growth was in machinery and implements which were substituted for both workstock and farm labor. As a result, capital per farm worker increased rapidly, farm labor declined steadily, and output increased with population growth and technological innovations.

During the period of 1910 to 1950, giant strides were made in farm output per farm worker and per unit of capital. The century of technology and knowledge was truly launched. Phenomenal results would be achieved from the use of new capital supplies almost equally suited to

substitute for land, livestock, or labor.[16] Yet steady increases in farm output are hardly due to mere physical capital, for the increments added have been small. Output has become the offspring of an endless expansion of knowledge – an invaluable capital addition to agriculture in the form of better-informed management and labor, improved technology of production, and costly but profitable urban-produced supplies for every phase of the production process.

Considerable support could be mustered for the conclusion that in aggregate terms agriculture has all the capital goods it will need in the foreseeable future. The capital additions that will be needed in real estate improvement, machinery, and urban-produced supplies will not change the totals very much. A highly inelastic product and dynamic technology set the perimeters. As long as low earnings exist for many factors already in farm production, the theory of capital formation does not suggest that vast streams of the economy's savings will rush to the agricultural sector to seek the reward of high marginal returns.[17]

Sources of Capital for the Individual Farmer

Capital only partial answer. How can the seeming contradiction be reconciled, i.e., adequate capital goods in the aggregate, need for much more capital by the individual farmer, and low returns on farm capital? The answer to improved farm income does not lie with a greater use of capital in existing patterns. Rather, it depends (to the extent that it is a capital problem) upon a capital base being used by management capable of higher productivities and in large enough combinations to return a desirable income in the presence of low average returns. An integral need is a reduction in the number of and an increase in the capacity of farm workers. Considerations other than capital, such as power in the market place, healthy economy, agricultural public policy, etc., are crucial to farm income improvement.

Contrasts at the aggregate and farm levels. The aggregate structure of farm capital may appear quite stable, while the ownership and use of such capital is constantly changing hands. It is at the individual farmer level where disparity of management and capital formation exists and is often perpetuated over the generations. This is where institutional barriers of belief, culture, knowledge, agency policy, and farm operation can hamper adequate capital growth. Furthermore, a farmer may find it profitable to use additional capital to expand production in a particular enterprise, e.g. strawberries, while similar action by a large group could result in loss of capital to all. Or a farmer may find local credit sources able and willing to finance a livestock enterprise, while similar action by many farmers could quickly exhaust the local capital supply.

[16] V. W. Ruttan, "Agricultural and nonagricultural growth in output per unit of input," Jour. Farm Econ., Vol. 39, Dec., 1955, pp. 1573-76.

[17] Farmer-owned capital had an estimated rate of return of only 3.2 percent in 1959, lowest in 25 years. The Farm Real Estate Market, USDA, Washington, D. C., Feb., 1960, p. 23.

These contrasts at the individual and aggregate levels reflect major obstacles unique to the farmer. Not only are the laborer, manager, and capital owner different decision-makers in the urban corporate organization, but the identity of ownership of particular capital goods remains obscure — so obscure that ownership can be transferred and inherited without having any effect upon the use of the capital. Also, as an exception to the process of capital formation, the corporation secures much of its capital by withholding income for reinvestment before it becomes available for possible consumption as earnings to individuals. Conversely, the farmer is usually the embodiment of all three — labor, management, and capital — without preparation for the decisions demanded or opportunity to reconcile conflicts among the roles. The primary qualification of most farm youths for farming is experience as laborers on family or neighboring farms. Their fitness for management is given little consideration, and their readiness for the role of capitalist is ignored.[18] In the best of traditions, the burden of financial decisions have been reserved for the head of the household, who may expect little help from public education.

Although there are shortcomings, the decisions of individual farmers in an enterprise economy result in capital formation in agriculture. Farm capital is not formed in the aggregate. Individually, many farmers will need substantially increased amounts of all types of capital to close the income gap (cf. Chapters 1 and 14). The dominant capital problem is how the individual farm operator can secure these increasing amounts of capital, large already, on the average, as is evident in Table 2.3. Part III is primarily concerned with this problem. The problem may involve mainly a redistribution of a stable aggregate farm capital base among operators and owners quite different from those now controlling it.

Sources of capital. Capital formation at the farm level can be best understood by a brief examination of the primary sources of capital. These are: (1) inheritance, marriage, and gifts, (2) purchase of capital with personal savings, (3) borrowing capital goods (renting), and (4) borrowing purchasing power for capital goods (credit).

1. Inheritance, marriage, and gifts do not even register as any one of the sources of capital at the aggregate level, but at the individual farmer level these are probably the most important means of capital acquisition, as indicated in Chapter 9.[19] Inheritance is a vehicle designed only to transfer ownership from one generation to the next. Since it is not designed for any particular objective of capital use, its utility in meeting farmers' capital needs depends upon how it is used. Thus, the degree to which the following conditions are met can determine

[18] L. A. Jones, "Financial management for farm people," Agricultural Finance Review, USDA, Washington, D. C., Vol. 18, Nov., 1955, pp. 1-9; What Young Farm Families Should Know About Credit, USDA, Farmers' Bul. No. 2135, Washington, D. C., June, 1959.

[19] Can You Own Your Farm?, NCR Publ. No. 14, Ky. Agr. Exp. Sta. Circ. 65, Nov., 1949; Becoming a Farm Owner, Publ. No. 17 of the Southeast Land Tenure Committee, Va. Agr. Exp. Sta. Bul. 473, June, 1955.

Table 2.3. Capital, Financial, and Income Data Per Farm and Per Farm Worker, United States, 1958

	Per Farm	Per Farm Worker
	(Dollars)	
Capital		
Physical assets		
Real estate (land and buildings)	24,500	15,500
Nonreal estate		
Livestock and poultry	3,000	1,900
Machinery and motor vehicles	3,700	2,300
Crops stored on and off farms	1,600	1,000
Production goods and services[a]	3,800	2,400
Financial assets		
Deposits and currency	2,000	1,300
U. S. savings bonds	1,100	700
Investments in cooperatives	800	500
Household furnishings and equipment	2,700	1,700
Liabilities		
Real estate debt	2,200	1,400
Nonreal estate and others	2,000	1,300
Proprietors' equities	35,000	22,100
Gross farm income	8,300	5,300
Net income of farm population from farming	3,400	2,100

Source: Balance Sheet of Agriculture, 1959, USDA, Agr. Info. Bul. No. 214, Washington, D. C., Oct., 1959, p. 6; Farm Income Situation, USDA, Washington, D. C., July, 1959, pp. 40, 41, 47, 48, 54.

[a] Primarily of nonfarm origin.

how well the inheritance process will contribute to capital formation for the individual farmers:[20]

a. Inheritance received when heir is ready to commence farming, not at middle age while in midst of alternative career.
b. Inheritance transferred in usable form, such as a farm or full line of machinery rather than an isolated tract of land or three-bottom plow.
c. Inheritance available as a "going concern" with highest possible value as capital. That is, an operating dairy is more valuable than the sum of individual components, or land in use is more valuable than abandoned land.
d. Inheritance involving the securing of expectations for both heir and predecessor so decisions of both can be more rational.
e. Inheritance arranged so predecessor's actions are viewed as fair and helpful, and yet provides for his old age without burdening others.

[20] Relevant research results on this problem are found in K. H. Parsons and E. D. Waples, Keeping the Farm in the Family, Wis. Agr. Exp. Sta. Bul. 157, Sept., 1945.

Incorporation of estates should be explored as one way of meeting these conditions. For those farmers fortunate enough to inherit capital under these desirable conditions, no better source can be found. However, for many farmers, one or all of the other three sources must be used. The choice should be related to his income level, the amount of his accumulated capital, his managerial ability, and his physical well-being and interest.

2. Savings were found at the aggregate level to be the most important current source in real gross farm capital formation. Savings are also a vital source for the individual farmer with enough income to support capital formation. The process of primary interest here is that of savings prior to purchase of the capital goods, rather than subsequent to the purchase as in credit use.

Savings become farm capital through three important processes. First, a substantial portion of gross capital formation in agriculture takes the form of buildings and machinery depreciation, production supplies, livestock replacement, and increases in values of livestock and given real estate. These capital inroads into gross income are so vital and normal to the ongoing farm operation that they usually take precedence over consumption. Second, the burden on every farmer to secure his own capital often calls for the use of production credit. This necessitates a type of forced saving to protect his livelihood, in which debt repayment may well get priority over consumption. Third, the entire purchase price of a capital good may be saved before the acquisition is made.

On the other hand, caution should be exercised in placing a heavy burden upon savings as the source of capital for the individual farmer. A low net income leaves little margin, after depreciation and consumption needs are met, for the volume of savings needed. The gross capital formation and increase in financial reserves at prevailing prices exhibited by agriculture from 1900 to 1950 — originating largely with savings — averaged only an estimated $300 per farm per year.[21] At even twice that rate of saving, though half the investment were inherited, 27 years would be required for a farmer to accumulate just the average amount of physical assets used per farm in 1958 (Table 2.3).

Just as profitable farming demands more capital, so the farm family is increasingly expecting a higher level of consumption (living) as the level of living of the nation rises. These same needs and desires continue to raise the cost of rearing farm children. It is indeed questionable whether the agricultural ladder process, firmly anchored in savings as the source of farm capital, is a meaningful alternative for future agriculture.[22] The role of savings can best provide for a gradual expansion of capital once an income earning base of farm capital has been obtained elsewhere.

[21]Capital formation, financial reserves, and number of farms from Tostlebe, *op. cit.*, pp. 50, 138. The rate of savings during the favorable 1945 to 1950 period was an estimated $800 per farm per year.

[22]Kanel, D., *et al.*, "Getting started in farming is hard," Land, The 1958 Yearbook of Agriculture, USDA, Washington, D. C., pp. 254-62.

Borrowing capital goods (renting). The third source of capital for the individual farmer, one not exposed by aggregate data, is borrowing the capital goods directly, or renting. Renting can take various forms — whole-farm share and cash arrangements, leasing of land units adjacent to owned land, custom use of capital goods, and certain contracts with vertical integration, as in livestock and poultry.[23]

Trend data on tenancy may conceal more than it reveals. To be sure, the trend generally has exhibited a reduced percentage of rented farms partly due to less share-cropping and to recovery from the agricultural depressions of the 1920's and 1930's. Upon closer scrutiny, however, renting is found as a stable or increasing system of farming in the commercial Corn Belt. Furthermore, in 1954, 34 percent of the farm land in the United States was operated as rented capital, most of it being leased by nearby owners.[24] Renting is probably second only to inheritance in importance as a source of capital to the individual farmer (cf. discussions by Raup in Chapter 9). In many lands the social, political, and economic revolutions call for the abolition of renting as an institution, e.g. Japan and India; yet renting has become a firmly established means of providing farm capital in some of the more stable, developed countries, e.g. England.[25]

Renting is a satisfactory source of capital only for certain farmers under particular conditions. If adequate capital can be acquired through inheritance, savings, or credit, assuming the role of a renter has little merit. However, farmers who are unable to obtain adequate capital through these means, but who have potentially sound managerial ability, may find renting an attractive source of capital. The adequacy of renting will further depend upon whether the operator is able to secure dependable, legally sound, and enduring rental arrangements, and whether he is willing to assume the somewhat unstable and socially less acceptable tenure status.[26] Upon meeting these conditions, farmers have a good chance of acquiring more capital and achieving higher net returns by renting than they would via credit. A further difference, without definite merit, is the expectation that the renter will share with the capital owner both windfall gains and losses. In the absence of perpetual indebtedness for the major physical farm assets, renting may assume an increasingly important role as a source of capital for the individual farmer. The argument for perpetual indebtedness is advanced in Chapters 1, 13, 15, and 17.

Borrowing purchasing power for capital (credit). The final major source of capital for the individual farmer is the borrowing of purchasing

[23] A. B. Mackie and E. L. Baum, "Programs for commercial farmers with low incomes," Problems and Policies of American Agriculture, Iowa State University Press, Ames, Iowa, 1959, pp. 417-22; R. C. Engberg, "Credit implications of integration in agriculture," Jour. Farm Econ., Vol. 40, Dec., 1959, pp. 1370-79.

[24] Land, *op. cit.*, p. 563; Agricultural Statistics, 1956, USDA, Washington, D. C., p. 426.

[25] K. H. Parsons, R. J. Penn, P. M. Raup, eds., Land Tenure, University of Wisconsin Press, Madison, Wis., 1956.

[26] R. G. F. Spitze and Gregorio Alfaro, "Property rights, tenancy laws of Cuba, and economic power of renters," Land Econ., Vol. 35, Aug., 1959, pp. 277-83.

power, or credit. The extent of credit use, measured by the ratio of total farm debt to value of physical assets, has risen and was approximately the same in 1959 as in 1910; however, it was twice as high in 1930.[27] Credit will assume a larger role according to the extent to which farmers seriously attempt to obtain capital needed to raise their incomes, and as the three other major sources of capital prove insufficient.

Credit has unique functions to perform in the farm capital formation process. Gross income can probably provide the capital for depreciation and much of the gradual accretion needed in physical farm assets, with the possible exception of machinery and buildings. Yet other functions remain for credit if the individual farmer is to have adequate capital. Ownership of existing farm capital, particularly the land resources, must be recombined under fewer operators. Furthermore, as long as owner-operatorship is the desired form of tenure, all farm capital must be transferred to new operators each generation.[28] As incorporation is used more by farmers as a versatile financial arrangement to assist in acquiring capital, bearing risk, and facilitating inheritance, credit becomes a more useful vehicle. Savings of both farm and nonfarm origin can be tapped through credit. Finally, credit is well suited to assist the farmer in obtaining the nonfarm capital goods increasingly needed as supplies for profitable production.

Credit, however, is not a satisfactory nor possible source of capital for all farmers. Even more than in renting, managerial ability is a prerequisite for satisfactory use of credit. Whereas in some rental arrangements managerial assistance is provided by the owner or supplier of the contract, the lender generally does not offer similar help. Furthermore, a borrower must have considerable owned capital if he is to obtain credit for an adequate unit. When a farmer with little equity attempts to use credit to meet all his capital needs, he may be burdened with a low-producing farm, high interest rates, and unfavorable terms. Finally, adequate credit use is rooted in adequate knowledge and beliefs.[29]

Credit sources are varied as to organization and operation, both of which are subjects of subsequent discussions. Generally, farmers have access to noncooperative private, cooperative private, and public sources of credit. Furthermore, most of these sources are being improved by new policies and programs. Two of these are: (1) revised procedures of the cooperative farm credit agencies to meet some of the many farmer needs, e.g., the initiation by the Production Credit Association of the

[27]Estimated at 13 percent for January 1, 1960, with one-half the debt being real estate and one-half being nonreal estate. 1960 Agricultural Finance Outlook, USDA, Washington, D. C., Nov., 1959, p. 5.

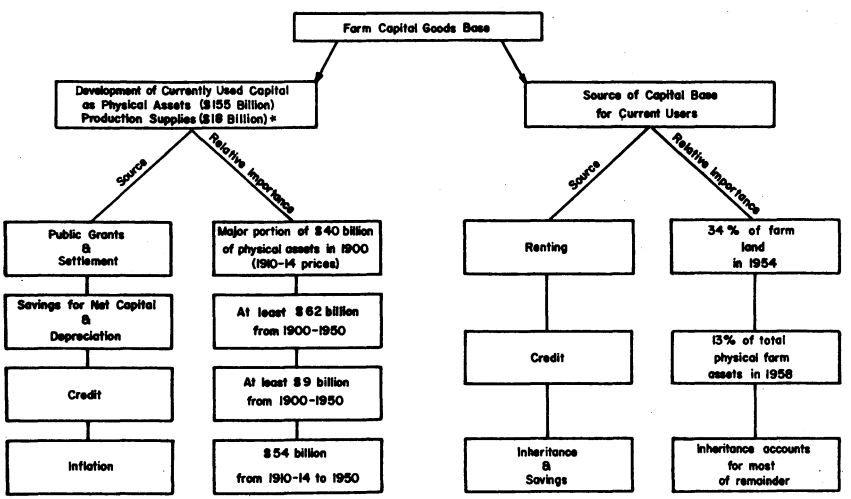
[28]Joseph Ackerman and Marshall Harris, Family Farm Policy, University of Chicago Press, Chicago, Ill., 1947, pp. 15-28.

[29]W. E. Hendrix, Approaches to Income Improvement in Agriculture, Prod. Res. Rpt. No. 33, ARS, USDA, Washington, D. C., Aug., 1959; W. H. Nicholls, "Southern tradition and regional economic progress," Southern Econ. Jour., Vol. 26, Jan., 1960, pp. 187-98.

five-year intermediate-term loan; and (2) expanded use of the agricultural representative by commercial banks serving rural areas, resulting in apparent benefits to both farmer and banker.[30] This needed change is discussed by Duggan in Part I, and others in Part III. The latter program can help overcome disadvantages to farmers associated with the urban nature of financial institutions. In view of rapidly increasing capital needs per farm worker and the longer terms of many of the capital commitments, incorporation, continuous renting, and perpetual indebtedness deserve further consideration for facilitating the capitalization process.

Savings, renting, and credit have been explored as sources of capital for farmers not fortunate enough to inherit a sufficient amount (see Figure 2.1 for summary). Yet none of these sources are relevant for a vast group of low-income farmers, namely, the aged, disabled, disinterested, and those possessing little potential managerial ability. The odds are convincing that these farmers cannot secure and use capital adequately to net them a desired income. However, this hardly implies the absence of a problem. The solutions would seem to rest not with obtaining farm capital, but with subsistence grants, improved educational opportunities, or migration assistance as discussed in Part IV.

[30] R. G. F. Spitze and R. J. Bevins, The Agricultural Representative Program in Commercial Banks of Tennessee, Tenn., Agr. Exp. Sta. Bul. 289, Aug., 1958.



*Taken from data for 1958 used in Table 2.3. Depreciation involved during the years of development does not, of course, show up in these cumulative data.

Fig. 2.1. General summary of capital formation process in agriculture (estimated from data in previous discussion).

Discussion

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Spitze's definition of capital revolves around the concept of abstinence. This requires him to be concerned with differences between "maintenance" and "consumption." Spitze concluded, after some discussion of the concept of capital, that capital is produced goods and services saved from consumption and used by or as a part of the human agent in further production. In view of his rejection of the tripartite classification of factors of production, could he not define capital as a valuable input that has duration? This view of capital allows the inclusion of public and semi-public sources as well as private sources. Furthermore, it makes no distinction between land and other "factors of production." Rather, the distinction is based upon durability and nondurability of assets.

In his discussion of the savings process and capital formation, Spitze emphasizes the fact that farmers have held values with regard to the allocation of income to savings and consumption different from those that have characterized much of the rest of society. This difference, however, is being reduced over time, and farmers now spend their income in approximately the same manner as other groups in our society.

Spitze emphasizes the role of knowledge as a factor influencing both supply and demand forces. He does not give due consideration, however, to the role of knowledge and the development of new technology as a form of public investment in agriculture. However, he does call attention to the giant strides in farm output per farm worker and per unit of capital that took place between 1910 and 1950, and the extremely large increase in output (24 percent) that occurred between 1950 and 1958 while total inputs were constant. The fact that total inputs were constant emphasizes our inability to place a value on management as such. Managerial capital is not considered as a part of the capital input in agriculture.

A more explicit treatment of resource development as a factor in capital formation would have been helpful. Only in this way can we tie the static aspects of resource use into concepts of capital formation.

Spitze calls our attention to the importance of working out new ways of "redistributing a relatively stable aggregate farm capital base among operators and owners quite different as individuals from those now controlling the capital base." He properly attacks our system which requires each generation of farmers to start from the beginning and accumulate the capital necessary to operate a profitable business. He contrasts the urban and farm situations in this regard. The question at

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hand, however, pertains not to urban and rural locations, but to the structural organization of agriculture in comparison with the structural organization of nonfarm firms. The difference is primarily one of the importance of individual proprietorship as a form of business.

Spitze raises the question of whether farm families should continue to have to rely upon savings as a source of capital for agricultural adjustment as they adopt more of the consumption patterns of urban people. This really raises the question of whether owner-operated farms can be organized in such a way as to generate sufficient income to provide equal levels of living for farm and nonfarm people and at the same time permit the farmer to pay off principal on his debts. This is one of the most difficult problems facing American agriculture.

In Chapter 2 Spitze indicated that renting and credit are satisfactory sources of capital only for certain farmers under particular conditions. The conditions developed by him, however, are not sufficient to serve as guides in resource-use decisions. This problem area certainly warrants a great deal more time and thought by economists.

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Spitze suggests that the capital problems of agriculture may well be rooted more in inadequate demand than inadequate supply. He attributes inadequate demand to lack of understanding by farmers in this matter of financial management. In a 1952 study, the Farm Credit Administration found that management, not credit restriction, was the greatest limiting factor in progressive use of credit for farm improvements.

What can be done to help improve the inadequate demand, or lack of understanding, in financial management? Agricultural lenders themselves should, in many cases, assume more of this responsibility. The agricultural colleges should devote more time and effort to this subject in their teaching, extension, and research departments. Our colleges have done much to help farmers grow many blades of grass where only one grew previously, but have done far too little in this matter of farm financial management. Some money and manpower in our colleges devoted to this job should pay big dividends in service to farmers. Also, there should be closer coordination of agricultural lenders, colleges, and agricultural leaders in this over-all educational program.

Certainly the farmer's views on credit should receive adequate consideration. A few years ago I asked a group of predominantly commercial farmers what they considered deserving farmers have a right to expect of credit. They agreed that "deserving" means the ability to borrow and repay with interest and be in a better financial position after having done so. Those farmers listed the following characteristics that deserving farmers can rightly expect of credit:

1. An understanding, permanent, and dependable source of credit.

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2. A credit plan that fits the farm plan in terms of (a) providing the right amount of money at the right time, with a minimum of time, trouble, and expense; (b) providing for repayments when products are marketed; and (c) interest charged on the actual number of dollars used and for the exact number of days the money is used (cf. Chapters 11, 13, 15, and 16).
3. Credit that will permit farming according to sound farm management practices rather than according to the limited cash on hand.

Progressive and farsighted agricultural lenders, such as the banks and associations that comprise the Farm Credit System, know that farmers have such credit needs and are constantly reshaping their programs to meet these needs (cf. Tootell's discussion in Chapter 17).