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CHAPTER 5

Trends in Financing of Capital Formation: Share of Internal Funds

Problems of Analysis

IN modern economies, additions to and replacements of capital goods are, to an overwhelming extent, purchased by the would-be capital user. They are not the product of his own work. We must, therefore, consider the question of financing: where does the capital acquiring unit obtain the means for purchases? Here the important distinction between internal financing (by the user's own funds) and external (by somebody else's funds) arises. It is important because in internal financing only the capital user's decision matters, but in external financing others share in making the decision. Within external financing there are also significant distinctions: between equity funds, which carry no fixed obligation of interest and repayment, and debt moneys; and within debt, among loans of differing duration and conditions as to security. There are, finally, important differences in external financing between funds that flow directly from the owner-lender to the borrower-user, and those that are channeled through financial intermediaries.

In discussing the magnitudes of capital formation in the two preceding chapters, we dealt with part of the final product of economic activity and compared it directly with the over-all product represented by the relevant countrywide totals. In discussing financing, we deal with an aspect of the mechanism by which capital formation is brought about, not with the eventual result. This shift in the orientation of discussion raises several problems that must be clarified before we can deal meaningfully with the relevant statistical estimates.

Share of Internal Funds

The question of financing is realistic only when viewed from the standpoint of a single economic unit intending to acquire capital goods for replacement or additions. Only when we ask where it secures the means for such acquisition can we see clearly the distinction between external and internal funds. When we deal with the economy as a whole, external means are limited to foreign funds; and in a closed economy, there can be no external funds. Indeed, by definition, countrywide capital formation is financed by savings, and the two totals are identical; hence any distinction between investment and financing can begin only at the level of a subsector of the total economy. To put it differently, a countrywide total of capital formation financing, if it is to have more meaning than a tautology, should be built up from the records of each economic unit, with the distinctions among units recorded, rather than disregarded as they are in estimating total capital formation.

If, then, we view the process from the standpoint of the single economic unit—the house purchaser, the firm, the nonprofit or the government institution—the first important observation is that such units cannot operate with real capital assets alone. They also need financial assets: cash and near cash, to cover gaps between receipts and payments; accounts receivable as a means of easing sales; government securities as a way of keeping quick reserves without undue loss of interest; and so on. On a countrywide basis, these financial claims cancel all counterclaims except those on the foreign debts and claims account. But they are indispensable to the economic units within the country. Thus we find, particularly for business firms (most important for our purposes), that changes in real assets, representing capital formation, are almost always accompanied by changes in financial assets. Hence, except in those rare cases in which real assets are the only ones that rise over the period under study, the financing stream—the flow of funds on the sources side—must be related, not to capital formation alone, but to the acquisition of all assets, financial included. A business firm, especially, is a complex of both real and financial assets, and we can distinguish the financing of capital formation alone by assuming exceptional conditions in which it represents the only use of additional funds or by dint of other unrealistic assumptions.

The difficulty is solved but poorly by assigning certain sources of funds exclusively to certain uses. It is tempting to argue that depreciation allowances are assignable to the financing of gross capital formation alone, but the fact is that in industries with a limited growth horizon such funds can be, and are, put to other uses; and this may

be true of all industries in times of depression. It seems plausible that short-term funds should be used to finance only quick assets; but it is rationally justifiable and not unusual for a growing industry to use them in part to finance long-term assets. The examples given refer to industries in the early and late stages of growth, because the fluidity among various sources of funds and uses is greatest in those transition phases. And one can argue that, "normally," long-term funds would be given priority in financing long-term assets, and short-term funds priority in financing quick assets. The exceptions are important, however, and it is necessary to stress in advance that many of the statistical comparisons to follow imply assumptions of too rigid a connection between specific sources and specific uses of funds.

There is a somewhat related difficulty. Granted an association between the character of the source of funds and the type of use, real and financial assets are interrelated and should be treated as a single complex. The point is important because levels of and trends in shares in financing of various types of sources are greatly affected. A simple illustration will suffice. Assume that a firm has gross real capital formation of $2 million, and an addition to its accounts receivable of $1 million—these being the only changes on the assets side. Assume further that there is a gross retention of $2 million, $1 million of which is depreciation allowances and $1 million retained profits, and that accounts payable increased $1 million—these being the only changes on the liabilities side. What was the share of capital formation financed by internal funds? If, as is often done, we net out accounts receivable and payable—which implies that this source of funds can finance only this use of funds—gross retention accounts fully for gross capital formation, and the share of internal funds in financing is 100 per cent. But if we say that the total $3 million of additions to assets was financed by $2 million of gross retention and $1 million of additions to accounts payable, the share of internal financing in total acquisition of assets is 66.7 per cent. We cannot say specifically, therefore, how gross capital formation was financed, except within a range of from $1 million to $2 million from internal funds, and from zero to $1 million from external funds.

I would be inclined to argue that the netting out of the receivables and payables in the example just cited (indeed, any netting out of this type) and the assignment of gross retention to gross capital formation exclusively represent an unwarranted oversimplification. For the problem of financing is essentially the problem of how effectively our

economic institutions function in placing capital in the hands of would-be capital users. The fact that the firm in the example added to its accounts payable meant that the credit network had to be stretched to accommodate the change; and the fact that the firm, at the same time, advanced an equal amount of credit—while it affected the firm's net position—does not obviate the need for the services of the credit system with respect to the payables. Furthermore, additions to accounts receivable may be viewed as a means of making capital formation effective from the standpoint of the firm. We should, therefore, view the total addition to assets as a bundle of items that cannot be separated, either by netting out or by assigning gross retention to gross capital formation alone.

Even if we follow the rule of comparing all additions to assets with changes in all sources of funds, the result may be oversimplified from the standpoint of a proper study of the financing process. The above example is a simple case of the customary sources- and uses-of-funds analysis, based largely upon net changes in assets (uses) and in liabilities (sources), with some partial use of the income account (for such items as depreciation charges and net retention). But these are all net changes, and during the year (if that is the period under consideration) large inflows and outflows of funds may occur, which call for further services of financial and credit mechanisms. Thus, there may be no net change in long-term debt outstanding; but an old bond issue may have been repaid and a new one floated. Such transactions are not effortless acts that should be represented by a blank in the accounts. Many items on the uses and sources sides of funds—notably the short-term ones—are far more subject to cancellation of gross inflows and outflows than others. If we argue—not without reason—that it is the gross flows of funds that are indispensable to the firm's operation during the year, the picture of internal and external financing may change sharply again. Thus, if in the above example we assume that the net addition of $1 million to accounts receivable was the result of a gross extension of $5 million and repayment of $4 million; that the same was true of the net addition to accounts payable; and that no such gross flows could be associated with the movement of depreciation charges and net retention, then total gross uses of funds are $7 million, and the share of internal financing in gross uses of funds drops to 29 per cent. This percentage is an accurate reflection of the share of internal funds in the total financial operations during the year by the firm in question. The example could be pushed further

to show also the effects on the calculation of the shares of internal and external financing.

If the argument above is valid, capital formation becomes a relatively small fraction of gross additions to total assets by the firm during the year, and the sources of its financing seem to become increasingly less identifiable. Yet it would be unrealistic to press the argument beyond its proper limit. It is useful only in indicating that capital formation financing is a small part of the total gross flow of funds financing economic activity. But if we treat financing in grosser terms, the distinction between long-term and short-term becomes stronger, and the rationale for assigning differing term funds to their corresponding term assets becomes more compelling. Net changes in short-term funds can be applied to long-term uses, up to a point; but this is not true of gross flows, which can be kept at their large volume only by frequent repayments. Conversely, long-term funds can be used for short-term assets and for their continuous circulation, but they are more appropriately employed when tied up in long-term assets; and if there is any need for the latter, long-term funds would have priority. In short, at the level of the single firm, we can get meaningful results by studying the financing of capital formation jointly with net changes in financial assets, setting against them the internal and external sources. If net changes in financial assets are not too large compared with additions to real assets, it may even be possible to discern movements in the financing of capital formation alone.

We rarely have data, however, for single economic units, and certainly not for enough of them to permit us to derive aggregates. Whatever data are available are already aggregates of units. This poses a new difficulty in the analysis of financing.

The difficulty is essentially that opposite movements among the units in the aggregate cancel each other. Assume that a firm employs its earned depreciation of $10 million to repay part of an outstanding bond issue, and has no other changes in assets and liabilities. Assume that another firm uses the same amount of earned depreciation plus $10 million derived from a bond issue to purchase $20 million in capital goods. For the aggregate—consisting of these two firms—total gross capital formation will be $20 million; the total debt outstanding will remain the same; and it will appear as if the $20 million in capital formation were financed by the earned depreciation, that is, entirely out of internal funds. But in reality, the firm that was responsible for this capital formation financed half of it from external funds; and the fact

that the other firm made a net contribution to the capital market by redeeming $10 million of its bonds does not obviate the need for the services of the financial institutions. In particular, the fact that the firm providing the $10 million in bonds had a part in the acquisition of the $20 million in capital goods is concealed in the aggregated totals.

This difficulty is clearly additional to those illustrated by the case of a single economic unit. The essential point here is that what is internal to an industry may be external to some firms in it; and what is internal to an economy may be external to some industrial sectors in it. The whole concept of internality and externality is dependent, in an aggregated total, upon the size of the group involved in the aggregation. In general, the larger the number of units in the aggregate, the greater the likelihood of cancellation of the kind illustrated, and hence the greater the amount of external financing concealed. It follows that the practice of aggregating to a net total tends to exaggerate the share of internal financing and to understate the share of external financing, if the distinction between the two is, as it should be, in terms of the unit responsible for the decision—the firm, the individual, or the nonprofit institution. It also tends to conceal any redistribution of liabilities and assets among the units in the aggregate, and hence the gross amount of external funds involved.

This bias and concealment could be obviated if, in the aggregation, units that had positive additions to a given type of asset could be separated from those that sustained net decreases in that asset. It could then be seen that the total additions were financed by corresponding changes on the sources-of-funds side (or by reduction of other assets); and that the total decreases were associated with corresponding reductions on the liabilities side (or with increases in other assets). But such totaling could be carried through systematically only for each type of asset separately (or for some specific combination of types), and would differ as the type of asset differed.

We could achieve the desired results if we divided all units into two groups—those whose gross capital formation was at least as large as their gross retention, and those whose gross capital formation fell short of the latter. Proceeding similarly for changes in financial assets, we could then observe the sources of financing separately for each group. But no such summations are available; and we are forced to operate with net aggregates of the type in our example.

The embarrassing consequence of this limitation is that it prevents us from observing trends in the proportion of concealment of external

financing, which may run against or reinforce other trends suggested by a sources-and-uses analysis of funds based on industry or larger aggregates. To illustrate: assume that the ratio of gross retention to gross capital formation for an industry is rising, suggesting a rise in the share of internal funds in financing capital formation. Assume further that, in line with earlier discussion, gross retention is related not to gross capital formation alone but to total uses—the sum of gross capital formation and net changes in financial assets—and the share of internal funds still rises. Yet over the period, disparities in behavior, of the type suggested in the illustration, among individual firms within the industry may have increased. Whereas in earlier days all firms added to their capital stock and drew fully upon their retained funds for the purpose, in recent times some firms have continued to follow that course and have even expanded their capital assets through borrowing, but others have failed to expand and in a sense have shifted their resources out of the industry. If such a trend occurred, the external financing concealed in the aggregates would have increased proportionately, possibly to the point of offsetting the trend toward the decline in the share of external financing suggested above. Conversely, the trend in disparities among firms may have been in the opposite direction, reinforcing the trend toward the decline observed in the share of external financing in total asset acquisition.

Further problems in the analysis are bound to emerge as we attempt to deal with the estimates, but they can best be noted as they appear. For the present, the following conclusions may be stated, as qualifications upon any findings suggested by the statistical aggregates.

1. Financing of capital formation, as distinct from financing of all asset acquisition, can be measured only if we assign certain sources of funds to capital formation as a first priority. Such an assignment may be unrealistic.

2. It follows that financing of all asset acquisition must be studied, at least as a check; and if net changes in financial assets loom large compared with capital formation, statements concerning financing of the latter can be made only within wide limits.

3. Financing assumes full meaning only for a single economic unit because the distinction between external and internal funds and changes in various types of external obligations can be clearly stated only for a unit. In aggregating, on a net basis, the data for groups, the considerable cancellation that usually occurs conceals external financing and exaggerates internal (external and internal from the

standpoint of the unit). It naturally fails to reveal gross demands upon borrowing of various types.

Distribution between Internal and External Financing: the Industrial Sectors

We begin examination of the statistical evidence with the data that bear upon the long-term trends in the shares of internal and external financing. As already indicated, we cannot work with countrywide totals but must use data for groups of capital users, the number of groups being determined largely by the available material. We discuss first the financing of nonfarm residential construction, on which our data are most direct; then proceed to the financing of capital formation in agriculture and, insofar as data permit, in nonfarm unincorporated business; go on to the financing of capital formation by business corporations, distinguishing as many major industrial sectors as possible; and conclude with the rather distinctive pattern of financing by governments.

NONFARM RESIDENTIAL CONSTRUCTION

Thanks to the work by Grebler, Blank, and Winnick, the sources of funds can be linked directly with a given complex of real capital formation—in this case, nonfarm residential construction (excluding nonhousekeeping units, which, however, are not a sizable proportion of the total).[1] The procedure involves direct, though approximate, data on the share of new construction (including cost of land) accounted for by transactions paid fully in cash; and then, within total housing expenditures financed by credit (largely mortgages), the share of purchase (or construction) costs accounted for by mortgage advances is distinguished (Table 34).

It should be noted at the start that cash purchases, which are described as internal financing, and whose share in total expenditures on nonfarm residential construction is shown in column 7, may exaggerate the true levels. If a person purchases a new house (or pays for its construction) with cash borrowed from a bank, external rather than internal financing is involved. It is fair to argue, however, that cash payments for residential construction can hardly be drawn to any significant extent from short-term credit sources; and if they repre-

[1] See Leo Grebler, David M. Blank, and Louis Winnick, *Capital Formation in Residential Real Estate: Trends and Prospects* (Princeton for NBER, 1956).

TABLE 34

SHARES OF EXTERNAL FINANCING AND INTERNAL FINANCING, NEW NONFARM RESIDENTIAL CONSTRUCTION, 1911–1955
(amounts in billions of dollars)

Periods	Total Expenditures for Nonfarm Residential Construction [a] (1)	Expenditures Financed by Mortgages and Contract Sales (2)	(2) as Per Cent of (1) (3)	Amount of Mortgages and Contract Sales (4)	(4) as Per Cent of (2) (5)	External Financing as Per Cent of Total (3) x (5) (6)	Internal Financing as Per Cent of Total 100 – (6) (7)
1. 1911–1920	13.41	9.60	71.6	6.50	67.7	48.5	51.5
2. 1921–1930	45.52	37.47	82.3	28.76	76.8	63.2	36.8
3. 1931–1940	14.23	12.10	85.0	8.68	71.7	60.9	39.1
4. 1941–1945	7.36	6.75	91.7	5.46	80.9	74.2	25.8
5. 1946–1955	105.49	93.32	88.5	76.96	82.5	73.0	27.0

[a] Including land.

SOURCE: Calculated from Leo Grebler, David M. Blank, and Louis Winnick, *Capital Formation in Residential Real Estate: Trends and Prospects* (Princeton for NBER, 1956), Table M-1, pp. 454–455, and Table 80, p. 320.

sent personal borrowing by the would-be capital user from relatives or friends, the sources of funds are still internal to the wider group of individuals joined by ties of blood or friendship. Yet, as measures of the share of internal financing, the entries in column 7 are overestimates.

The distinction here between internal and external is, as it should be, with reference to a single unit—whether an individual or a corporation—that purchases or constructs new residential housing. This means that much of the external financing, i.e., a large share of the funds advanced, chiefly as mortgage money, is contributed by owners of residential housing paying back advances made in the past. Thus, even in the prosperous 1920's and the second half of the 1940's, repayments of mortgages accounted for between one-half and three-quarters of the mortgage loans made during a given year.[2] In poor years, repayments are likely to exceed new mortgage advances. Hence, if we viewed all owners of residential housing as constituting a single industry (including the new entrants or new purchasers) and offset new mortgages (or other credit advances) by repayments, the share of external financing would be far smaller than that shown in column 6 of Table 34. But the share as shown is far more relevant for our purpose.

[2] *Ibid.*, Table 49, p. 179.

Share of Internal Funds

Over the period covered by Table 34, the share of external sources in the financing of new nonfarm residential construction has risen markedly, and that of internal financing declined correspondingly. Even though the periods distinguished are, for the most part, discrete decades—no attempt having been made to cancel out the effects of long swings—the upward movement of the share of external financing is pronounced, consistent, and unmistakable.

The distribution within the table indicates that the upward trend is a composite of two subtrends. First, the proportion of new construction that involves external financing (i.e., that is not fully a cash transaction) has been rising (column 3). Second, the share of mortgages and contract sales in total expenditures financed by borrowing has also been rising (column 5). Indeed, the very high levels reached by the percentages in columns 3 and 5 suggest that they are not far from a limit. If we assume that, at most, 95 per cent of residential construction requires some financing (after all, some purchases will be made with cash), and that the ratio of the value of mortgages to the total expenditures financed by borrowing cannot appreciably exceed 80 per cent, then the upper limit of the share of external financing is 76 per cent—not much higher than the share prevailing since 1941.

While Table 34 covers only the period since 1911, there is evidence to suggest that the upward trend in the share of external financing is of longer duration—indeed, can be traced back to 1890. According to Grebler, Blank, and Winnick, the proportion of net change in mortgage debt to total nonfarm residential construction in 1910–1919 was about 38 per cent (compared with the 48.5 per cent share of external financing of total expenditures in 1911–1920, line 1 of Table 34), and the corresponding per cent was 15.5 in 1900–1909, and only 8.4 in 1890–1899.[3] Even if the rise in the ratio of new mortgage financing to new construction was not as rapid as that in the ratio of net changes in debt to new construction, it also must have risen appreciably between 1890–1900 and 1910–1920. Moreover, the proportion of mortgaged homes among owner occupied dwellings has increased (since 1890) and there is a tendency for the debt-to-value ratio of these mortgaged homes to rise.[4] It seems clear that the upward movement in the share of external financing in nonfarm residential capital formation is a trend that goes back at least to 1890.

[3] *Ibid.*, Table 45, p. 171.
[4] *Ibid.*, Table 44, p. 170.

During the same period, the ratio of depreciation or capital consumption allowances to gross capital formation represented by nonfarm residential construction was rising. This ratio, for volumes in current prices, rose from 37 per cent in 1889–1909 to 64 per cent in 1941–1950.[5] While the extension to 1955 lowers the ratio of depreciation charges to 44 per cent,[6] it is still higher than in 1889–1909; and through much of the period, when the share of internal financing was declining, the ratio of depreciation charges to gross value of new housing was rising. If we could assume that depreciation charges were "earned" by real estate owners, and that they were a source of financing internal to the whole group of owners, including the new, the share of internal sources would show an upward rather than a downward trend. But this is precisely what we cannot assume: the units that were earning and accumulating depreciation funds were least likely to be the units that were purchasing new construction.

Before we speculate about the reasons for the upward trend in the share of external sources in financing new nonfarm residential housing, three other relevant trends should be briefly noted. First, within this category there has been a steady rise in the share of owner occupied dwellings, and a decline in that of tenant occupied. The former rose from about 37 per cent in 1890 and 1900 to about 53 per cent in 1950; and the latter declined accordingly from about 63 per cent to about 47 per cent.[7] This means that owner occupied dwellings represented an increasing share of the net additions to the number of dwelling units. Between 1890 and 1910 the total increase in number of dwelling units reporting tenure was 5.7 million, the rise in owner occupied being 2.3 million or 40 per cent, and that in tenant occupied, 3.4 million or 60 per cent. The rise from 1910 to 1930 amounted to 9.2 million units, of which the rise in owner occupied was 5.3 million or 58 per cent and that of tenant occupied, 3.9 million or 42 per cent. From 1930 to 1950, the net addition to dwelling units was 14.2 million, of which the rise in owner occupied was 9.3 million or 65 per cent and the rise in tenant occupied, 4.9 million or 35 per cent. Thus the rise in the share of external financing was paralleled by an upward trend in the share of new dwellings that were owner occupied.

[5] *Ibid.*, Table 16, p. 66.

[6] *Ibid.*, Table 78, p. 313.

[7] By 1956 the share of owner occupied dwellings had risen to 59 per cent—see *Consumer Instalment Credit* (Board of Governors, Federal Reserve System, 1957), Part I, Vol. 1, Table 1, p. 10. See also *Historical Statistics of the United States, 1789–1945*, and *Continuation*, Series H-102 and H-104.

Second, during the last two to two and a half decades, the proportion of one-family dwellings in the total increased markedly.[8] The record extends back only to 1900. During the first three decades, one-family dwellings accounted for only about two-thirds of the total number of nonfarm housekeeping dwelling units started. Indeed, the proportion declined somewhat in the 1920's when it accounted for about 62 per cent, whereas two-family dwellings constituted almost 15 per cent, and three-family or multifamily units, almost 23 per cent. But in the period 1946–1955, one-family dwelling units accounted for 87 per cent of all dwellings, with two-family units constituting about 4 per cent, and multifamily units, somewhat over 9 per cent of all dwellings.

The third, and for the present purpose perhaps most important trend, was the decline in real capital investment per dwelling, relative to the general rise in per capita income. For the twenty years, 1889–1908, average expenditure per new private nonfarm housekeeping dwelling unit was $5,679, in 1929 prices, whereas in 1946–1955 it was only $3,894.[9] Net national product per worker, also in 1929 prices, rose from $1,057 in 1889–1908 to $2,242 in 1946–1955 (see Table 5, column 6, excluding military capital formation). This means that the ratio of average expenditure per dwelling unit to net national product per worker declined from 5.4 in 1899–1908 to 1.7 in 1946–1955. While one should not overrate the significance of the magnitudes just quoted, it is clear that the ratio of capital investment per dwelling unit to the average income of individuals has declined substantially.[10]

With these several trends in view, an explanation of the long-term rise in the share of external financing of new nonfarm residential con-

[8] See Grebler, *et al., op. cit.,* Table B-2, pp. 333–334, and *Historical Statistics.*

[9] Grebler, *et al., op. cit.,* Table J-1 and p. 315.

[10] Two factors may have made the decline somewhat smaller. One is the possible decline in the number of workers per family unit with the reduction in size of family, and a slightly lower ratio of labor force to total population in 1950 than in 1910. The other is the fact that national product per worker as shown relates to total labor force, not to nonfarm alone. The recent increase in the ratio of per-worker income in agriculture to per-worker income in the nonagricultural sectors means that product per worker in the nonfarm areas increased at a slightly lower rate than the countrywide level of product per worker. But both qualifications are quantitatively minor, and would reduce the decline in the ratio only slightly.

See also the recent discussion of the trend in average expenditure per dwelling unit in Margaret G. Reid, "Capital Formation in Residential Real Estate," *Journal of Political Economy,* April 1958, pp. 131–153, and the reply, "Once More: Capital Formation in Residential Real Estate," by Grebler, Blank, and Winnick, in that journal, December 1959, pp. 612–627.

struction can be suggested—particularly if we assume that the capital users are primarily individuals for whom house ownership and use is not a major occupation. We could, then, say that the rising trend in the share of external sources in financing new residential housing was a consequence of the increased willingness of would-be capital users—largely households—to borrow in order to acquire such assets, and of the increased willingness of lending agencies to extend credit. Although the factors involved in the demand for and supply of funds were somewhat interrelated, it is convenient to note them separately.

The increased willingness of the capital users to borrow was one manifestation of a broader movement that has emerged since 1900 and extended also to consumer durable goods.[11] It was partly an effect of the rising standard of living, of the increased output of goods per capita, which permitted consumers to satisfy their desire for superior goods, including owned houses rather than rented houses. It was partly an effect of technological changes, which permitted the extension of urban residential areas (and we deal here with nonfarm housing) away from the congested centers of cities, and made single-family dwelling economically more feasible. It was partly a result of the reduction in real capital invested per dwelling unit, a finding referred to above. The declining ratio of such capital investment to average income diminished the risk to the would-be capital user in acquiring ownership, even though investment meant the assumption of debt. The increasing stability of income over time, and the long-term rise in prices, which automatically brings about a decline in the ratio of fixed debt to the value of an asset, had similar effects. Finally, the terms of mortgage financing changed: interest rates were lowered and the average contract term was lengthened, which made the burden of borrowing easier.[12]

There were also changes on the supply side of funds, which increased the willingness of lending agencies to finance a rising share of new gross capital formation in this field. The very factors that reduced the risk to would-be capital users in assuming debt obligations in their purchase of new housing made the potential borrowers more credit worthy. The growth in the volume of mortgage financing meant, under normal conditions, a greater volume of repayments from which new housing could be financed. An increasing share of personal savings was flowing to such intermediate institutions as insurance companies

[11] See the discussion in *Consumer Instalment Credit,* Part I, Vol. 1, Chap. 2, pp. 7–21.

[12] See Grebler, *et al., op. cit.,* Chap. XV, pp. 220–237.

and building and loan associations, which found placement of funds in mortgages relatively attractive. Last, but not least, the attempt by the government, since the 1930's, to support residential mortgage credit has had considerable impact.[13]

AGRICULTURE

Turning now to trends in financing of capital formation in agriculture, we shift to capital users who must be treated more as business units than as households, although there is still an intimate connection between the farmer's business and his household.

Table 35 is based on the work of Tostlebe, presented in detail in his monograph, cited previously.[14] Data for 1950–1955 were extrapolated by the movement in the Department of Agriculture estimates. Because we deal here with a business unit, we are immediately confronted with some of the problems touched upon in the first section of this chapter. Should we relate the sources of financing to real capital formation alone, or to total additions to assets? And specific to farming (and other unincorporated business) is the question: should we view financial reserves (other than cash working balances) as internal to the business unit, or external?

The period of some fifty-five years covered by Table 35 is fairly long, as economic periods go. Yet it has been affected by violent changes in prices and in the market position of agriculture, which distort the ratios and make the establishment of long-term trends a rather hazardous undertaking. With this advance warning, we present some preliminary conclusions. We deal here with the financing of gross capital formation: the assignment of any sources of funds to net capital formation would be so arbitrary that inferences would be worthless.

1. In studying the movement of the ratio of borrowing to gross capital formation, we omitted the periods that cover the span from 1930 through 1944. In the depressed decade of the 1930's, capital formation was quite small, and market conditions restricted the supply of external funds. In the 1940–1944 quinquennium, on the other hand, funds were available but the supply of real capital goods was restricted. Both periods are, therefore, distorted either on the supply-of-funds side, or on the supply-of-assets side.

[13] *Ibid.*, Chapter XVI.

[14] Alvin S. Tostlebe, *Capital in Agriculture: Its Formation and Financing since 1870* (Princeton for NBER, 1957).

TABLE 35

CAPITAL FORMATION FINANCING, AGRICULTURE, 1900–1955
(amounts in billions of dollars)

	1900–1909 (1)	1910–1919 (2)	1920–1929 (3)	1930–1939 (4)	1940–1944 (5)	1945–1949 (6)	1950–1955 (7)
Uses of Funds							
1. Net real capital formation	3.7	5.8	−1.6	−0.6	2.6	3.9	9.7
2. Capital replacement	5.2	9.0	13.2	9.7	7.3	13.3	20.1
3. Gross real capital formation, lines 1 and 2	8.9	14.8	11.6	9.1	9.9	17.2	29.8
4. Net increase in cash working balances	0.4	1.5	−0.5	0.6	2.9	2.4	2.4
5. Net increase in financial reserves	0.5	3.8	−1.2	0.7	7.9	3.3	
6. Total, lines 3, 4, and 5	9.8	20.1	9.9	10.4	20.7	22.9	32.2
Sources of Funds							
7. Capital consumption allowances	5.2	9.0	13.2	9.7	7.3	13.3	20.1
8. Net income, line 9 minus line 7	1.9	1.4	−4.7 (−6.7)	2.7 (−0.3)	15.4	6.6	5.8
9. Gross retention, line 11 minus line 10	7.1	10.4	8.5 (6.5)	12.4 (9.4)	22.7	19.9	25.9
10. Borrowing (net)	2.7	9.7	1.4 (3.4)	−2.0 (1.0)	−2.0	3.0	6.3
11. Total (equals line 6)	9.8	20.1	9.9	10.4	20.7	22.9	32.2
Ratios							
12. Capital consumption allowances to GCF, line 2 or 7 to line 3	0.58	0.61	1.14	1.07	0.74	0.77	0.67
13. Gross retention to GCF, line 9 to line 3	0.80	0.70	0.73 (0.56)	1.36	2.29	1.16	0.87
14. Borrowing to GCF, line 10 to line 3	0.30	0.66	0.12 (0.29)	—	—	0.17	0.21
15. Gross retention to total uses, line 9 to line 6	0.72	0.52	0.86 (0.66)	1.19	1.10	0.87	0.80

GCF = gross capital formation.

Figures in parentheses in cols. 3 and 4 are adjusted for estimated change in debt by foreclosure—see Tostlebe, *op. cit.*, pp. 142–144.

In this and the following tables in Chapters 5 and 6, a dash (—) indicates that the ratio was not computed because the numerator and/or the denominator was negative, zero, or close to zero.

SOURCE, BY COLUMN

(1)–(6) Tostlebe, *op. cit.*, Tables 34–36, pp. 135–138.
(7) *The Balance Sheet of Agriculture, 1956*, Agriculture Information Bulletin No. 163, Nov. 1956.
Line 1. Changes in volumes in constant prices, Table 2, p. 4, multiplied by the price index derived from Tables 1 and 2.
Line 2. Depreciation and consumption of farm capital, Table 3, p. 6. The entry for 1951 is interpolated.
Lines 4–5. Change in financial assets, Table 1.
Line 10. Change in total debt, Table 1.

2. We can compare the experience of the three decades from 1900 through 1929 with that of the last eleven years of the period studied, 1945–1955. The share of borrowing, which was three-tenths of gross capital formation during 1900–1909, rose sharply in 1910–1919, when the increasing values of land and acquisitions of new farms were accompanied by extensive borrowing. The net change in debt in the 1920's should be corrected for the effects of reduction by foreclosure,

which obviously is not a reduction of debt by a draft upon income. With this approximate correction (see figures in parentheses in columns 3 and 4), the share of net borrowing in gross capital formation in the 1920's amounted to about three-tenths. The arithmetic mean share for the three decades is 42 per cent, compared with less than 20 per cent for the 1945–1955 period. One might say, then, that the share of borrowing in financing of new capital formation in agriculture declined appreciably.

3. A similar conclusion emerges if we relate borrowing to total uses of funds, that is, consider net increase in cash working balances and in financial reserves as part of the operating complex of agriculture. The share of borrowing in that larger total was 28 per cent in 1900–1909, 48 per cent in 1910–1919, and, with the correction for foreclosures, 34 per cent in 1920–1929, the arithmetic mean for the three decades being 37 per cent. The corresponding share was 13 per cent for 1945–1949 and 20 per cent for 1950–1955, an average of about 16 per cent for 1945–1955. Thus over the period the share of borrowing in total uses of funds declined to less than one-half its share in the early periods.

4. The conclusions remain unchanged if we exclude the decade of World War I as atypical. The share of borrowing in the financing of gross capital formation in 1900–1909 and in 1920–1929 (30 per cent) is higher than the share in 1945–1955 (below 20 per cent) and the same trend is evident in the share of borrowing in total uses of funds.

5. It follows that the share of internal financing—gross retention—in capital formation or in total uses rose over the period. But was this rise associated with the capital consumption allowances or the net income component of internal financing? In line 12 we show the ratio of capital consumption allowances to gross capital formation, based on current price values. Had this ratio been based on values in constant prices, we would expect to find a fairly continuous upward trend. There is some trace of such a trend even in the ratio shown, but it is not pronounced. True, during 1900–1919, the ratio of capital consumption allowances to gross capital formation was about 60 per cent, whereas the corresponding ratio for 1945–1955 was over 70 per cent. But when we include the 1920's, the average for the first three decades is almost 80 per cent.

6. One is more impressed by the role played by changes in the ratio of net income to gross capital formation in producing the upward trend in the ratio of internal financing to capital formation. Net in-

come was about two-tenths of gross capital formation in 1900–1909, less than one-tenth in 1910–1919, and was negative in 1920–1929. For 1945–1955, the ratio of net income to gross capital formation was over 26 per cent. The rise in the share of internal financing, indicated by the comparison of 1945–1955 with the period 1900–1929, may be ascribed, to a considerable extent, to the economic improvement in the position of agriculture, whereby it could earn sufficient net income, not only to increase its financial assets substantially, but to finance internally an increasing proportion of additions to its real assets—its gross capital formation.

In concluding this brief discussion of the findings suggested by Table 35, two major qualifications must be emphasized. First, a long-term "trend," derived by comparing the experience of eleven years at the end of a fifty-six year span with that of two or three decades at the beginning, may be subject to a wide margin of error. The rather wide changes in financial structure in agriculture from one decade to the next revealed in Table 35 make it unsafe to infer trends from such a comparison. Yet the data do not permit us to do much else.

The second qualification may be far-reaching. It results from the necessity of using data on outstanding debt to derive net borrowing, and of estimating net income as a residual. The implication of such a basis for our estimates—that net borrowing, i.e., net changes in debt outstanding, should be associated either with gross capital formation or with total additions to assets—may be unwarranted.

This point can be illustrated by a simple example. Assume that farmer Jones, having reached retirement age, sells his farm to young Smith, a new member of the farm community, and accepts a mortgage from Smith on the heretofore debt-free farm. Other conditions remaining the same, mortgage debt of the farming community increases, and we have a plus entry on the sources-of-funds side, and neither capital formation nor addition to financial assets on the uses-of-funds side. But the net income item on the sources-of-funds side, which is a residual, will be reduced to maintain the equality of sources and uses. Comparison over time will then show, other conditions being equal, a rise in the share of net borrowing in gross capital formation (or total uses) and a decline in the share of internal financing accounted for by a drop in the share of financing from net income. The example indicates the replacement of savings originally invested in agriculture (the equity of farmer Jones) by debt. Such shifts are quite common in a sector like agriculture, where exits and entries are frequent.

Share of Internal Funds

Another typical situation involves transfers within the body of capital users, disregarding entries and exits. If one farmer sells his land to another at a higher price than he paid—the buyer using funds borrowed from financial institutions to cover part of the purchase price—debt increases without any gross capital formation, as we measure it. However, in this case, the seller would be recorded—if he stays within agriculture—as a unit that added to its cash balances or financial reserves or to its real capital assets. If our data are complete, and we consider the capital users in agriculture a closed group, changes in debt (except through foreclosure) must be reflected in the uses of funds. But the lines of connection with real capital formation could not be distinguished from the lines of connection with additions to financial assets.

Because of these effects of transactions, either across the boundaries of agriculture or within agriculture, on the meaning of the net borrowing and net income items on the sources-of-funds side, it is important to recognize that the volume of such transactions is quite large. We have data on the number of voluntary sales of farms (as distinct from foreclosures) per thousand farms, from 1912 to date. The annual percentage of all farms passing through voluntary sales varied from a low of about 1.6 to 2 in the early 1930's (when sales were difficult and foreclosures ran high) to a peak of almost 6 in the late 1940's.[15] Cumulation of these percentages over a decade, assuming no repeats, would show that one-half of all farms changed hands within a decade. This is, of course, an exaggeration, but the point is that in agriculture, as in all sectors dominated by small business units, change in ownership is quite frequent. The transactions involving already existing complexes of assets must therefore be far greater than those involving new gross capital formation.

It follows that the evidence in Table 35 can be interpreted as shedding light on trends in internal and external financing of capital formation (real and financial) in agriculture only under the highly restrictive assumption that the proportion of changes in debt (and of the residual item, net income invested) that financed acquisition of real and financial assets, as distinct from the proportion that financed entries and exits, showed no definite trend over time. And any statement concerning trends in the shares of financing of gross real capital formation is based upon the further assumption that the proportion of

[15] See Tostlebe, *op. cit.*, Table 37, p. 144.

changes in debt (and the proportion of net income) that financed acquisition of real assets showed no distinct trend over time. We have no data by which to test the validity of these assumptions. But it is relevant to note that, while the number of farms increased from 5.7 million in 1900 to 6.8 million in 1935, it declined to 5.4 million in 1950, and the reduction may have continued beyond that year. Insofar as the reduction toward the end of the period meant a larger number of exits, and to the extent that these were accompanied by withdrawal of savings from agriculture and their replacement, if only partly, by assumption of debt, such additions to debt should not be assigned to financing of new capital formation (gross or net). If the inference just made is valid, it only reinforces the conclusion suggested by Table 35, that the ratio of internal financing to capital formation rose.

NONFARM UNINCORPORATED BUSINESS

Data on capital formation and financing for this sector of the economy are meager and unreliable. We are fortunate to have the estimates derived by Goldsmith.[16] These estimates, as Goldsmith emphasizes, are based upon a rough allocation between the corporate and unincorporated sectors, and must be interpreted with caution.

The relevant data are summarized in Table 36. It would have been possible, using Goldsmith's estimates, to distribute gross savings, or retention, between capital consumption allowances and net income (with all estimates on an original cost basis of depreciation, with net income unadjusted for effects of inventory revaluation and for the difference between original cost and replacement bases of depreciation, and with capital formation including changes in inventory in current valuation). But the basis for this distribution would be too tenuous to yield significant results.

The table runs only through 1949. But one may assume that, as for agriculture (see Table 35), the share of borrowing in total uses of funds in the period 1950–1955 would show a rise over that in 1945–1949. In both cases, the great volumes of financial assets accumulated during the war years, when the supply of capital goods was restricted, were the major source of funds during 1945–1949; and in the later years, greater reliance was placed on external funds.[17]

[16] Raymond W. Goldsmith, *A Study of Saving in the United States,* Vol. I (Princeton University Press, 1955).

[17] That net *additions* to cash and government securities of nonfarm unincorporated business were recorded for 1945–1949 is due largely to the inclusion of 1945. For

TABLE 36

GROSS CAPITAL FORMATION FINANCING, NONFARM UNINCORPORATED BUSINESS, 1897–1949
(amounts in billions of dollars)

	1897–1914	1915–1919	1920–1929	1930–1934	1935–1939	1940–1944	1945–1949
				Volumes			
1. Gross real capital formation	6.68	4.67	16.20	0.96	4.63	6.32	14.50
2. Net change in cash and government securities	1.18	2.48	0.34	−1.37	0.85	13.00	2.00
3. Net changes in receivables	0.96	0.93	−0.42	−3.58	0.42	1.35	1.46
4. Total additions to assets, lines 1, 2, and 3	8.82	8.08	16.12	−3.99	5.90	20.67	17.96
5. Changes in debt	2.60	3.07	3.53	−3.09	−0.22	0.26	5.22
6. Gross retention or savings, line 4 minus line 5	6.22	5.00	12.59	−0.90	6.12	20.41	12.74
				Ratios			
7. Gross retention to GCF, line 6 to line 1	0.93	1.07	0.78	—	1.32	3.23	0.88
8. Gross retention to total additions to assets, line 6 to line 4	0.71	0.62	0.78	—	1.04	0.99	0.71
9. Changes in debt to GCF, line 5 to line 1	0.39	0.66	0.22	—	—	0.04	0.36

Security brokers and dealers, and the professions are excluded.
SOURCE: Raymond W. Goldsmith, *A Study of Saving in the United States*, Vol. I (Princeton University Press, 1955), Table U-11, p. 869.

With this assumption concerning the movement of the ratios in 1950–1955, the broad conclusion can be stated simply: there is little evidence of a long-term trend in the ratio of external (or internal) sources to either gross capital formation or total additions to assets. This conclusion is based largely upon the entries for three periods: 1897–1914, 1920–1929, and 1945–1949 extended on the basis of what probably happened during 1950–1955.[18] We exclude the quinquennium 1915–1919 as too much affected by World War I, and the period from 1930 through 1944 as too distorted by the depression of the 1930's and the effects of World War II.

The ratio of gross retention (internal funds) to gross capital formation was 0.93 in 1897–1914, 0.78 during the 1920's, 0.88 in 1945–1949, and either the same or somewhat lower in 1950–1955, showing no definite movement. Likewise, the ratio of gross retention to total additions to assets was 0.71 in 1897–1914, 0.78 in the 1920's, 0.71 in 1945–1949, and probably dropped in 1950–1955. This indicates rough stability in the ratio of internal sources, and hence of borrowing, to total additions to assets. Finally, the ratio of changes in debt to gross capital formation was 0.39 in 1879–1914, 0.22 in the 1920's, 0.36 in 1945–1949, and probably rose in 1950–1955—again indicating the absence of any significant long-term movement.

In the nonfarm unincorporated business sector, we find, then, long-term trends in the shares of external and internal financing different from those observed in nonfarm residential construction and in agriculture. As pointed out, the comparison with nonfarm residential construction is scarcely warranted in view of the basic difference in the measures used for these two sectors. The reason for movement different from that in agriculture can only be conjectured. Agriculture shifted from extensive expansion before 1930 to intensive growth after that. There was a marked rise, particularly during 1940–1955, in the ratio of its per capita income to the countrywide (or nonfarm) average income. No such major shifts took place in nonfarm unincorporated business, which in Table 36 is heavily dominated by distributive trades and (a distant second) the construction industry. While the unincorporated business sector was losing ground, in that its proportion of the

1946–1949, the net change would be −$2.0 billion, instead of +$2.0 billion, as shown in Table 36 for 1945–1949 (see Goldsmith, *op. cit.*, Table U-11, p. 869).

[18] We have, in fact, made rough estimates for 1950–1955, primarily to complete the summary in Tables 45 and 46, below. But these estimates are too rough for use in the discussion of the specific sector.

activity of either the whole nonfarm capital using field or of that within each respective industry was falling off, there is no evidence of change in its character and in its per capita income relative to other branches of the economy as great as that in agriculture.

It need hardly be stressed that the qualifications of the conclusions for agriculture from Table 35 apply equally to the conclusions for nonfarm unincorporated business from Table 36. In this sector also, exits and entries are quite frequent; and, moreover, shifts from unincorporated to corporate status are common. There is no basis for evaluating the possible effects of continuous and large exits from and entries into the sector of nonfarm unincorporated business. It may be assumed, however, that the shift from noncorporate to corporate status, insofar as it withdraws the larger units which, because of their size, may exploit the advantages of incorporation, is partly responsible for the absence of significant trends in Table 36. To put it differently: if one could assume that units remained unincorporated no matter how large they grew, and if such larger units can and do rely on greater use of external funds, the trend toward larger size might have produced an upward trend in the share of external financing. In that sense, the movement toward corporate status makes for stability of structure, and hence of the type of financing practices, within the nonfarm unincorporated sector.

ALL CORPORATIONS

Here we deal with what is quantitatively and analytically the most important segment of capital formation inasmuch as business corporations provide the auspices, in times free from war pressures and restrictions, for most of the real capital formation in the country. The trend in the dependence of corporate financing on internal versus external sources is then a major factor in evaluating the degree to which business capital formation is subject to the test of the capital funds market. Of course, even internal sources must meet the test of the market. Depreciation allowances must be earned if they are to be available for financing, or to put it differently, net retained profits must be positive. Thus, the market passes upon a business firm by paying the price that yields positive net profits, and permits the firm to finance replacement or expansion from within. External financing must meet even more stringent tests, and it is of interest to observe the extent to which the financing of capital formation is subjected to those tests.

We observed in Chapters 3 and 4 that, in general, the ratio of capital consumption allowances to gross capital formation rose distinctly over

the period from 1870, as shown by ratios based on long, two-decade to three-decade spans. This finding has little bearing upon the financing of residential housing, since, as already indicated, individual households are the main capital users, and we cannot expect the capital consumption charges to be earned and made directly available within the unit as an internal source of funds. In agriculture, we found some reflection of this trend in the rise in the ratio of capital consumption allowances to gross real capital formation. The data on nonfarm unincorporated business firms did not warrant separating capital consumption allowances from net retained income. However, for the aggregate of business corporations in the United States, we can expect that, assuming no distinct contrary trend in the share of corporate savings (net undistributed profits), the share of capital consumption allowances in real gross capital formation will show a rise. This, all other conditions being equal, should make for a rise in the share of internal financing.

It is this hypothesis that provides the rationale for Table 37. Through most of the period it is based on Goldsmith's estimates, capital consumption allowances and net undistributed profits (corporate savings) being adjusted for effects of inventory revaluation and the difference between original cost and replacement cost of depreciation reserves. The series are thus comparable with those on capital formation in Chapters 3 and 4. For the years since 1950, however, we cannot adjust for the difference between original and replacement cost of depreciation charges, although we can adjust for effects of changes in inventory valuation.

Table 37 suggests some conclusions, and also points to the difficulties of inferring long-term trends over the period since 1900. We can try to discern the long-term trends in two ways. First, following the procedure used earlier, we can eliminate the periods of war and distortion due to cyclical depressions, and observe the ratios over the periods marked by substantial capital formation under relatively prosperous conditions. Thus, if we concentrate our attention upon three periods—1897–1914, 1920–1929, and 1946–1956—we find that the ratio of capital consumption allowances to gross capital formation rose from about 0.39 in the first, to 0.56 in the second, and can be roughly estimated at 0.60 in the last.[19] This shows some rise in the ratio of capital con-

[19] The Goldsmith series were extrapolated to 1956 by the Department of Commerce estimates, by applying to the ratios in columns 6 to 8, line 8, the movement of the ratios from 1946–1949 to 1946–1956, i.e., from line 10 to 12. In averaging the ratios for longer periods the entries in column 1 were used as rough weights.

TABLE 37

COMPARISON OF GROSS AND NET CAPITAL FORMATION WITH GROSS AND NET RETAINED INCOME, ADJUSTED TOTALS, ALL CORPORATIONS, 1897–1956

(amounts in billions of dollars)

Periods	GCF (1)	Capital Consumption Allowances (2)	Savings (net retention) (3)	Gross Retention (2) + (3) (4)	NCF (1) − (2) (5)	Ratios of: (4) to (1) (6)	(2) to (1) (7)	(3) to (5) (8)
				GOLDSMITH ESTIMATES				
1. 1897–1904	12.0	4.1	4.9	9.0	7.9	0.75	0.34	0.62
2. 1905–1914	24.3	10.1	7.0	17.1	14.2	0.70	0.42	0.49
3. 1915–1919	23.4	13.0	9.8	22.8	10.4	0.97	0.56	0.94
4. 1920–1929	72.4	40.4	20.4	60.8	32.0	0.84	0.56	0.64
5. 1930–1934	12.2	19.7	−16.9	2.8	−7.5	0.23	1.61	—
6. 1935–1939	22.2	19.0	−4.1	14.9	3.2	0.67	0.86	—
7. 1940–1945	35.3	28.5	17.2	45.7	6.8	1.29	0.81	2.53
8. 1946–1949	71.6	32.8	23.6	56.4	38.8	0.79	0.46	0.61
9. 1946–1956 [a]						0.81	0.60	0.55
				COMMERCE ESTIMATES				
10. 1946–1949	72.0	22.7	27.1	49.8	49.3	0.69	0.32	0.55
11. 1950–1956	180.5	83.6	46.1	129.7	96.9	0.72	0.46	0.48
12. 1946–1956	252.5	106.3	73.2	179.5	146.2	0.71	0.42	0.50
Longer Periods								
13. 1897–1914	36.3	14.2	11.9	26.1	22.1	0.72	0.39	0.54
14. 1915–1939	130.2	92.1	9.2	101.3	38.1	0.78	0.71	0.24
15. 1940–1956 [b]						0.88	0.63	0.66

Because of rounding, detail will not necessarily add to total.

GCF = gross capital formation; NCF = net capital formation.

[a] Extrapolated by the movement from line 10 to line 12.

[b] Weighted ratios. In cols. 6 and 7, the weights (from col. 1) are: 1940–1945, 0.04; 1946–1956, 0.25. In col. 8, the weights (from col. 5) are: 1940–1945, 0.007; 1946–1956, 0.12.

SOURCE, BY LINE

1–8. R. W. Goldsmith, *A Study of Saving*, Vol. I, Tables R-27, R-29, P-5, P-11, P-19, C-1, and C-41. All components are adjusted to correspond to the concept of capital formation.

10–12. *Economic Report of the President*, January 1957, Table E-53, p. 182, adjusted for changes in inventory valuation as shown in Table E-9, p. 132. Banks and insurance companies are excluded.

sumption allowances to gross capital formation. In the same periods, the ratio of gross retention to gross capital formation moved from 0.72 to 0.84, to 0.81. Here also the share of internal sources rose, but not consistently.

The other approach to establishing the long-term trends is by including all periods, even the exceptional ones of war or other unusual conditions. On the theory that those exceptional periods were the product of the antecedent years—which were consequently also exceptional because they gave rise to exceptional effects—and that those exceptional spans were in turn followed by periods that represent reactions and thus were also in some way unusual, we should include all periods. The problem is how to calculate averages that represent a balance of distorting elements. The three long periods in lines 13 to 15 are an attempt at such averaging. It may be deficient, particularly in that the span from 1940 through 1956 represents a less complete period than the preceding two. The ratio of capital consumption allowances to gross capital formation, thus derived, moved in about the same fashion as that based on the other procedure: it rose from 0.39 in 1897–1914 to 0.71 in 1915–1939, and declined to 0.63 in 1940–1956, but still showed a significant long-term rise. The proportion of total internal sources to gross capital formation rose fairly steadily over the three long periods—from 0.72 to 0.78 to 0.88. Even if we allow for exaggeration in the last period, for which the average might be reduced if more recent years were included, we may still conclude that there has been a long-term rise since 1900 in the ratio of corporate gross retention to corporate gross capital formation.

It is worth noting that the rise shown in Table 37 in the ratio of gross retention or internal funds to gross capital formation was due exclusively to the rise in the ratio of capital consumption allowances to the latter. The ratio of retained profits to gross capital formation did not show the long-term rise. Thus, in the three normal periods, 1897–1914, 1920–1929, and 1946–1956, the ratio of retained profits to gross capital formation was 0.33, 0.28, and 0.21, respectively, suggesting a decline rather than a rise. Likewise, in the three all-inclusive periods, 1897–1914, 1915–1939, and 1940–1956, the ratio of retained profits to gross capital formation was 0.33, 0.07, and 0.25, respectively—again indicating no long-term rise.

Table 37 also shows movements of the ratio of retained profits (corporate savings) to net capital formation. For reasons already indicated, corporate savings cannot be assigned to the financing of net

real capital formation alone. Yet we may ask whether those savings were sufficient to finance net additions to capital, and whether there were any visible trends in the ratio of the one to the other.

The entries in column 8 indicate that, on the whole, the ratio of net retention to net capital formation did not rise—unless we include the war affected period, 1940–1945. The ratio was 0.54 in 1897–1914, 0.64 in 1920–1929, and 0.55 in 1946–1956. Only if we compare 1897–1914 with 1940–1956 does the proportion rise—from 0.54 to 0.66. Thus, while the ratio of gross retention to gross capital formation definitely rose, that of net retention to net capital formation showed no significant rise. This conclusion is compatible with our other findings of a rise in the share of capital consumption allowances in gross capital formation, and of a slight decline (or constancy) in the ratio of net retained profits to gross capital formation.

In Table 37 gross capital formation is adjusted for effects of inventory revaluation; net capital formation and retained net profits are adjusted for both the inventory revaluation effects and those due to the shift of depreciation to replacement from original cost basis; and capital consumption allowances are estimated on replacement rather than original cost basis. These adjusted totals differ from the totals recorded in corporate accounting and hence from those presumably recognized by entrepreneurs. Yet economic analysis warrants their use—for they do indicate what properly measured gross (and net) retention means relative to properly measured capital formation. It is of interest to study the ratios based on unadjusted totals, i.e., those reflecting changes in inventory in current valuation, and capital consumption allowances and net undistributed income as measured by customary accounting practices. Those ratios are given in Table 38.

Since the entries in this table reflect the fluctuations in prices more than do those in Table 37 (if prices were constant, the two sets of entries would be identical), the ratios show more conspicuous variations, and long-term trends are all the more difficult to discern. Yet some significant differences between Tables 37 and 38 with respect to long-term trends can be seen.

First, whereas when we use the adjusted totals the ratio of capital consumption allowances to gross capital formation shows a distinct upward trend, when we use the unadjusted totals the long-term rise is much reduced. Thus in Table 37, the ratio rose from 0.39 in 1897–1914 to 0.60 in 1946–1956 or to 0.63 in 1940–1956. In Table 38 the rise was only from 0.36 in the first period to either 0.39 for 1946–1956 or

TABLE 38

COMPARISON OF GROSS AND NET CAPITAL FORMATION WITH GROSS AND NET RETAINED INCOME, UNADJUSTED TOTALS, ALL CORPORATIONS, 1897–1956

(amounts in billions of dollars)

Periods	GCF (1)	Capital Consumption Allowances (2)	Savings (net retention) (3)	Gross Retention (2) + (3) (4)	NCF (1) − (2) (5)	Ratios of: (4) to (1) (6)	(2) to (1) (7)	(3) to (5) (8)
				GOLDSMITH ESTIMATES				
1. 1897–1904	12.6	3.9	5.4	9.4	8.7	0.75	0.31	0.62
2. 1905–1914	24.7	9.4	7.6	17.0	15.3	0.69	0.38	0.50
3. 1915–1919	31.4	9.3	19.9	29.2	22.1	0.93	0.30	0.90
4. 1920–1929	63.5	30.4	19.7	50.0	33.1	0.79	0.48	0.60
5. 1930–1934	8.3	18.9	−25.3	−6.4	−10.6	—	2.28	—
6. 1935–1939	23.0	17.2	−2.5	14.7	5.8	0.64	0.75	—
7. 1940–1945	40.9	23.2	24.0	47.2	17.7	1.15	0.57	1.36
8. 1946–1949	82.3	22.3	42.2	64.5	60.0	0.78	0.27	0.70
9. 1946–1956 [a]						0.78	0.39	0.63
				COMMERCE ESTIMATES				
10. 1946–1949	83.5	22.7	38.6	61.3	60.8	0.73	0.27	0.63
11. 1950–1956	191.3	83.6	56.9	140.5	107.7	0.73	0.44	0.53
12. 1946–1956	274.8	106.3	95.5	201.8	168.5	0.73	0.39	0.57
Longer Periods								
13. 1897–1914	37.3	13.3	13.0	26.4	24.0	0.71	0.36	0.54
14. 1915–1939	126.2	75.8	11.8	87.5	50.4	0.69	0.60	0.23
15. 1940–1956 [b]						0.83	0.41	0.71

Because of rounding, detail will not necessarily add to total.

[a] Extrapolated by the movement from line 10 to line 12.

[b] Weighted ratios. In cols. 6 and 7, the weights (from col. 1) are: 1940–1945, 0.04; 1946–1956, 0.27. In col. 8, the weights (from col. 5) are: 1940–1945, 0.02; 1946–1956, 0.17.

SOURCE: See notes to Table 37.

0.41 in 1940–1956. The much greater rise in prices of capital goods in the recent decades than that which preceded 1897–1914 reduced the ratio of capital consumption allowances at original cost to capital formation in current prices much more after 1940 than it did after 1897. There were similar effects of differences in movement of inventory values.

Second, while the shift from the adjusted to the unadjusted totals reduced the rise in the proportion of capital consumption allowances to gross capital formation, it had the opposite effect on the proportion of net retained profits to gross capital formation. In Table 37, the proportion declined from 0.33 in 1897–1914 to 0.21 in 1946–1956 (or 0.25 in 1940–1956). In Table 38, the corresponding ratio rose from 0.35 in 1897–1914 to 0.39 in 1946–1956 (or 0.42 in 1940–1956). The price movements that reduced the ratio of capital consumption charges raised the ratio of net profits.

Third, the opposite effects of the shift from the adjusted to unadjusted totals upon the trends in the proportions of capital consumption allowances and of net profits to gross capital formation largely offset each other. As a result, the movement in the ratio of total gross retention to gross capital formation in the unadjusted totals is about the same as in the adjusted. Thus in Table 37, this ratio rose from 0.72 in 1897–1914 to 0.81 in 1946–1956 (or 0.88 in 1940–1956); the corresponding ratio in Table 38 rose from 0.71 to 0.78 (or 0.83). The rise in the share of internal financing in the unadjusted totals is thus only slightly less than in the adjusted.

Finally, the unadjusted totals show a different movement in the ratio of retained profits to net capital formation. This ratio in Table 38 rose from 0.54 in 1897–1914 to 0.63 in 1946–1956 (or 0.71 in 1940–1956) in contrast to the stability in Table 37 (0.54 in 1897–1914, and 0.55 in 1946–1956, but 0.66 in 1940–1956).

Nonfinancial Corporations

We now consider the *total* uses and sources of corporate funds (Table 39). Here we use Goldsmith's series (extended through 1956 by the Commerce estimates). These series exclude financial corporations. (Their inclusion in Tables 37 and 38 did not matter because they account for minor fractions of the totals involved.) Inventories are taken at current valuation, and capital consumption allowances are on an original cost basis—with a corresponding effect on net retained profits—just as in Table 38. Our primary interest here is in the movement

TABLE 39

SOURCES OF FUNDS, NONFINANCIAL CORPORATIONS, 1901–1956
(amounts in billions of dollars)

Periods	Total Sources (1)	GCF (inventories at current valuation) (2)	Net Financial Assets (1) − (2) (3)	Internal Sources (4)	Capital Consumption Allowances (5)	Retained Profits (6)	Total Net Uses (1) − (5) (7)	External Sources (1) − (4) (8)	Ratios of: (4) to (1) (9)	(5) to (1) (10)	(6) to (7) (11)	(8) to (7) (12)
					GOLDSMITH ESTIMATES							
1. 1901–1912	40.0	26.1	13.9	22.1	13.4	8.7	26.6	17.9	0.55	0.34	0.33	0.67
2. 1913–1922	76.1	49.4	26.7	46.0	25.6	20.4	50.5	30.1	0.60	0.34	0.40	0.60
3. 1923–1929	86.1	51.1	35.0	47.1	32.1	15.0	54.0	39.0	0.55	0.37	0.28	0.72
4. 1930–1933	−0.6	5.2	−5.8	4.1	20.8	−16.7	−21.4	−4.8	—	—	—	—
5. 1934–1939	28.9	26.0	2.9	28.2	31.4	−3.3	−2.5	0.7	0.98	1.09	—	—
6. 1940–1945	75.4	40.9	34.5	60.5	36.6	23.9	38.8	14.9	0.80	0.49	0.62	0.38
7. 1946–1949	110.6	82.3	28.3	71.3	33.7	37.6	76.9	39.3	0.64	0.30	0.49	0.51
8. 1946–1956 [a]									0.61	0.38	0.37	0.63
					COMMERCE ESTIMATES							
9. 1946–1949	100.5	83.5	17.0	63.0	23.0	40.0	77.5	37.5	0.63	0.23	0.52	0.48
10. 1950–1956	254.8	192.4	62.4	142.0	83.4	58.6	171.4	112.8	0.56	0.33	0.34	0.66
11. 1946–1956	355.3	275.9	79.4	205.0	106.4	98.6	248.9	150.3	0.58	0.30	0.40	0.60
Longer Periods												
12. 1901–1922	116.1	75.5	40.6	68.1	39.0	29.1	77.1	48.0	0.59	0.34	0.38	0.62
13. 1913–1939	190.5	131.7	58.8	125.4	109.9	15.4	80.6	65.0	0.66	0.58	0.19	0.81
14. 1940–1956 [b]									0.64	0.40	0.40	0.60

Because of rounding, detail will not necessarily add to total.

[a] Based on extrapolated absolute volumes. They are, therefore, slightly different from ratios calculated directly from the movement of the ratios from line 9 to line 11.

[b] Calculated from absolute volumes underlying the ratios in lines 6 and 8.

SOURCE: Raymond W. Goldsmith, *Financial Intermediaries in the American Economy since 1900* (Princeton for NBER, 1958), Table 53, pp. 222 and 223, extended by Department of Commerce data in *Survey of Current Business*, April 1954, Table 1, p. 15; October 1956, Table 1, p. 12; and February 1957, Table 11, p. 19.

of the ratio of all internal sources (gross retention) to total sources or uses of funds, the two totals being conceptually identical.

For short, relatively normal periods—1901–1912, 1923–1929, and 1946–1956—the ratio of capital consumption allowances to total uses of funds was 0.34, 0.37, and 0.38, respectively (column 10). Its movement is quite similar to that of the ratio of capital consumption allowances to gross capital formation in Table 38 from 1897–1914 to 1946–1956. There was also a rise—not large, but perhaps significant—in the averages over the long periods, 1901–1922, 1913–1939, and 1940–1956, the ratio moving from 0.34 to 0.58 to 0.40.

The upward trend is also slight when we compare total internal funds with total uses (column 9). The ratio was 0.55 in 1901–1912, 0.55 in 1923–1929, and 0.61 in 1946–1956. The change is equally slight in the ratio for the longer periods: from 0.59 in 1901–1922 to 0.64 in 1940–1956.

Just as in Tables 37 and 38 we studied the movement in the ratio of net retention (corporate savings) to net capital formation, so here we can observe the movement in the ratios of corporate savings and external sources to net total uses, i.e. total net of capital consumption allowances (see columns 11 and 12). The ratio of net savings to net total uses is stable, when we compare 1901–1922 (0.38) with 1923–1929 (0.28) and 1946–1956 (0.37); but the inclusion of 1940–1945 introduces a slight rise—to 0.40—in the ratio for 1940–1956. The ratio of external sources to net total uses also shows no marked trend: it was 0.62 in 1901–1922, 0.81 in 1913–1939, 0.63 in 1946–1956, and 0.60 in 1940–1956. Perhaps it is safest to infer that there were no significant long-term trends in the ratios of net retention and external financing to net total uses or sources.

Before passing on to major subgroups within the total body of corporations, it may be useful to recapitulate the findings.

1. For totals adjusted for effects of inventory revaluation and of the difference between original cost and replacement cost bases of capital consumption allowances, the ratios of both the latter and gross retention to gross real capital formation show a rise over the half century.

2. Again for adjusted totals, the ratio of net retention (corporate savings) to net real capital formation shows no significant rise over the period, unless we include 1940–1945 in the last period.

3. When we shift the analysis to unadjusted totals, more directly relevant to the study of financing flows, the rise in the ratio of capital consumption allowances to gross capital formation is greatly reduced.

By contrast, the shift to unadjusted totals produces a rise in the ratio of net retention (corporate savings) to gross capital formation. With these two effects of the shift from adjusted to unadjusted totals largely offsetting each other, the ratio of total gross retention to gross capital formation in the unadjusted totals still shows a rise.

4. The ratio of net retention (corporate savings) to net capital formation in the unadjusted totals shows a rise, whereas the corresponding ratio for the adjusted totals shows stability, unless we include the period 1940–1945.

5. Again for the unadjusted totals, the ratios of both capital consumption allowances and gross retention to total uses show but a minor rise, distinctly smaller than that in the ratios to gross capital formation.

6. The establishment of the trends suggested above was greatly affected by extremely wide variations in the ratios from period to period, even for periods as long as twenty years.

7. The moderate magnitude of the rise in the ratio of internal financing (gross retention) to total uses (in unadjusted totals) may be attributed to a combination of offsetting trends. One trend is the rise in the share of capital consumption allowances, when calculated on the basis of prices comparable with those underlying current capital formation (that is, in the adjusted totals). Offsetting this trend are: (a) the reducing effect, in depreciation accounting based on original cost, of the growing difference between the current and past prices of capital goods—an effect due to the greater rate of rise in those prices since the 1930's than in the periods preceding the 1920's and particularly before 1918; and (b) the proportional increase of nondurable assets in recent decades.

Mining and Manufacturing Corporations

For this major group we have a special analysis in Dobrovolsky's part of the joint monograph with Creamer and Borenstein.[20] Table 40 presents a comparison of plant and equipment expenditures (excluding inventory additions) with gross retention and its components.

The conclusions are briefly summarized.

1. The ratio of gross retention to plant and equipment expenditures shows an upward trend over the period 1900–1953. On an unadjusted basis (line 7b), the ratio was 0.88 in 1900–1914, 1.04 in 1920–1929

[20] Daniel Creamer, Sergei Dobrovolsky, and Israel Borenstein, *Capital in Manufacturing and Mining: Its Formation and Financing* (Princeton for NBER, 1960).

TABLE 40

COMPARISON OF GROSS RETENTION AND NET SECURITY ISSUES WITH PLANT AND EQUIPMENT EXPENDITURES, MINING AND MANUFACTURING CORPORATIONS, 1900–1953

(amounts in millions of dollars, averages per year)

	1900–1914 (1)	1914–1919 (2)	1920–1929 (3)	1929–1937 (4)	1938–1946 (5)	1946–1953 (6)
Volumes						
1. Plant & equipment expenditures	1,014	2,041	2,461	1,736	3,171	9,345
2. Capital consumption allowances						
2a. Adjusted	484	1,366	2,291	1,890	2,769	5,866
2b. Unadjusted	432	1,170	2,065	2,018	2,763	5,332
3. Net retained profits						
3a. Adjusted	429	1,038	837	−824	1,447	3,284
3b. Unadjusted	459	1,968	503	−1,264	2,002	5,092
4. Gross retention						
4a. Adjusted, lines 2a and 3a	913	2,404	3,128	1,066	4,216	9,150
4b. Unadjusted, lines 2b and 3b	891	3,138	2,568	754	4,765	10,424
5. Net capital formation						
5a. Adjusted, line 1 minus line 2a	530	675	169	−154	402	3,479
5b. Unadjusted, line 1 minus line 2b	582	871	396	−282	408	4,013
6. Net security issues	314	488	870	10	206	2,032
Ratios						
7a. Line 4a to line 1	0.90	1.18	1.27	0.61	1.33	0.98
7b. Line 4b to line 1	0.88	1.54	1.04	0.43	1.50	1.12
8. Line 6 to line 1	0.31	0.24	0.35	0.01	0.06	0.22
9a. Line 2a to line 1	0.48	0.67	0.93	1.09	0.87	0.63
9b. Line 2b to line 1	0.43	0.57	0.84	1.16	0.87	0.57
10a. Line 3a to line 1	0.42	0.51	0.34	−0.47	0.46	0.35
10b. Line 3b to line 1	0.45	0.96	0.20	−0.73	0.63	0.54
11a. Line 3a to line 5a	0.81	1.54	4.95	—	3.60	0.94
11b. Line 3b to line 5b	0.79	2.26	1.27	—	4.91	1.27
12. Line 6 to line 5b	0.54	0.56	2.20	—	0.50	0.51

Because of rounding, detail will not necessarily add to total.

SOURCE: Based on estimates by Sergei Dobrovolsky in the joint monograph with Daniel Creamer and Israel Borenstein, *Capital in Manufacturing and Mining: Its Formation and Financing* (Princeton for NBER, 1960), Tables 40 and 41, pp. 121 and 131.

The estimates by Dobrovolsky are annual average values for successive business cycles. For the present table, we combined the averages without regard to the varying duration of the cycles. The entries for 1900–1914 are arithmetic means of the annual average values for the cycles, 1900–1904, 1904–1908, 1908–1911, and 1911–1914; those for 1914–1919 are averages for a single cycle; those for 1920–1929 are means of averages for three peak-to-peak cycles, 1920–1923, 1923–1926, and 1926–1929. The entries for 1929–1937 and 1938–1946 are averages for single cycles; those for 1946–1953 are means of annual averages for two cycles, 1946–1949 and 1949–1953. In calculating the cycle averages, Dobrovolsky gave the terminal year values half weight.

The estimate of capital consumption allowances is adjusted for the difference between original cost and replacement bases; the estimate of retained profits is adjusted also for the effects of changes in inventory valuation.

and 1.12 in 1946–1953. While the inclusion of 1954–1956 and later years might reduce the last ratio somewhat, it would probably still be significantly above that in 1900–1914. The rise in the ratio of adjusted gross retention to plant and equipment expenditures (line 7a) was somewhat smaller, but still suggests an upward trend.

2. The ratio of capital consumption allowances to plant and equipment expenditures (lines 9a and 9b) also rose—from 0.43 or 0.48 in 1900–1914, to 0.57 or 0.63 in 1946–1953. The movement is quite similar to that of the ratio observed for all corporations in Table 37, but not in Table 38.

3. No such clear trends emerge in the ratio of net retained profits to plant and equipment expenditures (lines 10a and 10b). On an adjusted basis it was 0.42 in 1909–1914, 0.34 in 1920–1929, and 0.35 in 1946–1953. By contrast, when we use the unadjusted totals, the ratio declined from 0.45 in 1900–1914 to 0.20 in 1920–1929, but then rose to 0.54 in 1946–1953. Our judgment as to the trend in the contribution of net profits to the financing of plant and equipment expenditures depends upon the concept. If we adhere to estimates of capital consumption allowances and net profit corresponding to the economic accounting approach, the rise in the ratio of gross retention to gross plant and equipment expenditures can be seen to be due to the rise in the relative weight of capital consumption allowances, not of net retained profits. Here again the conclusions agree with those derived for all corporations, in Table 37.

4. The ratio of net security issues to plant and equipment expenditures (line 8) shows no rise, but rather some suggestion of a decline. This ratio was 0.31 in 1900–1914, 0.35 in 1920–1929, and 0.22 in 1946–1953. The inclusion of 1954–1956 and later years might raise the last ratio and reduce the decline substantially.

5. On both the adjusted and unadjusted bases, the ratio of net profit retention to net durable capital formation (lines 11a and 11b) rose: from 0.81 or 0.79 in 1900–1914 to 0.94 or 1.27 in 1946–1953. But in 1920–1929 it was either at the 1946–1953 level or much higher, and the movement therefore is not sufficiently consistent over time to be given much weight.

6. The latter is true also of the ratio of net securities issues to net durable capital formation (line 12): on an unadjusted basis it was 0.54 in 1900–1914, 0.51 in 1946–1953, but as high as 2.20 in 1920–1929.

We may now ask what the trends in the shares of total uses of funds were. The summary of the relevant data is provided in Table 41, also

TABLE 41

TOTAL, INTERNAL, AND EXTERNAL FINANCING, LARGE MANUFACTURING CORPORATIONS, 1900–1953
(amounts in millions of dollars, averages per year)

	1900–1910 (1)	1915–1919 (2)	1920–1929 [a] (3)	1929–1937 (4)	1938–1946 (5)	1946–1953 (6)
Volumes						
1. Total financing	110	744	550	464	3,093	7,350
2. Expenditures on physical assets	n.a.	451	417	452	2,070	6,156
3. Other, line 1 minus line 2	n.a.	293	133	12	1,023	1,194
4. Internal financing	77	447	532	445	2,348	4,910
4a. Capital consumption allowances	34	125	270	409	1,265	2,117
4b. Undistributed earnings	43	322	262	37	1,083	2,793
5. External financing, line 1 minus line 4	32	296	18	19	745	2,440
Ratios						
6. Line 4 to line 1	0.70	0.60	0.97	0.96	0.76	0.67
6a. Line 4a to line 1	0.31	0.17	0.49	0.88	0.41	0.29
7. Line 4 to line 2	n.a.	0.99	1.28	0.98	1.13	0.80
7a. Line 4a to line 2	n.a.	0.28	0.65	0.90	0.61	0.34
8. Line 5 to line 2	n.a.	0.66	0.04	0.04	0.36	0.40

Because of rounding, details will not necessarily add to total.
n.a. = not available.
[a] Omitting one-half of 1923.
For sources and method of averaging cycle data, see notes to Table 40, and Creamer, *et al.*, *op. cit.*, Tables 44 and 46, pp. 142–143 and 148. There are three distinct samples: one collected by NBER, relating to 1900–1910; the second, also from NBER, used in cols. 2–4; and the third, from the Board of Governors, Federal Reserve System, used in cols. 5 and 6.

based on Dobrovolsky's analysis. But here serious qualifications attach to the representativeness of the data. They are for large manufacturing corporations alone, and the sample is quite small, particularly for the years preceding the 1920's when only 14 to 50 corporations were included. Whatever conclusions we derive from the estimates must be viewed as highly tentative. This table, like Table 39, is based upon business accounting, unadjusted totals.

7. The ratio of internal financing, i.e. gross retention, to total uses (line 6) fails to show any upward trend over the period. It was 0.70 in 1900–1910, 0.97 in 1920–1929, and 0.67 in 1946–1953. This relative constancy over the long period in the ratio of internal (and hence,

external) financing to all uses is to be compared with the slight rise in the internal financing ratio for all nonfinancial corporations in Table 39.

8. The ratios of the two components of gross retention—capital consumption allowances and undistributed earnings—to total uses were also relatively constant over the period (see line 6a). It is difficult to say whether the absence here of the trends observed in the ratios for all corporations in Table 39 represents a significant difference.

The Regulated Industries

A similarly brief exploration of the trends in financing of capital formation, or rather total uses, can be undertaken for four of the principal components of the regulated industries (all corporate) on the basis of the detailed analysis in Ulmer's monograph.[21] The relevant data are assembled in Table 42.

In contrast with the findings for all corporations, and for the mining and manufacturing sectors of the corporate group, there are pronounced trends here in the shares of internal and external financing in total uses and sources of funds. For steam railroads the share of gross retention (internal funds) in total uses rose from slightly over two percentage points in 1880–1890 to over 100 per cent in 1941–1949. The rise was less sharp for telephones, but here also the 40 per cent gross retention ratio in 1941–1950 was far greater than the 6 per cent ratio in 1891–1902. There is a similar movement in the financing of total uses in electric light and power, and street and electric railways.

Two comments are relevant. As Ulmer points out, the last period, 1941–1949, 1941–1950, or 1938–1950, combines two rather dissimilar periods: the war years, when gross retention was quite large in relation to total uses of funds, and the postwar years, when the ratio of gross retention to total uses must have dropped considerably. It follows that the ratio of gross retention to total uses for 1946–1956, if available, would be appreciably lower than that shown for the last period in Table 42. Yet it is almost certain that it would be higher than the very low ratio characterizing the early periods in the table.

Second, this upward trend in the ratio of gross retention to total uses of funds would persist even if we compared 1946–1956 with the first decade of the century—omitting the pre-1900 periods for greater comparability with the span studied for all the other sectors. A rough

[21] Melville J. Ulmer, *Capital in Transportation, Communications, and Public Utilities: Its Formation and Financing* (Princeton for NBER, 1960).

TABLE 42

Capital Formation Financing, Four Major Components of the Regulated Industries, 1880–1950

(amounts in millions of dollars)

Industrial Component and Capital Financing Item	Period I (1)	Period II (2)	Period III (3)	Period IV (4)	Period V (5)	Period VI (6)	Period VII (7)
Steam Railroads							
1. Dates	1880 [a]–1890 [c]	1893 [a]–1907 [c]	1907 [a]–1916 [d]	1914 [a]–1920 [d]	1921 [b]–1930 [d]	1931 [b]–1940 [d]	1941 [b]–1949 [d]
2. Gross capital formation	2,687	2,978	5,280	3,021	8,088	2,874	7,020
Percentages of Total Uses (Sources)							
3. Gross capital expenditures [e]	86.5	76.7	111.1	93.4	115.3	117.6	84.9
4. Other assets	13.5	23.3	−11.1	6.6	−15.4	−17.7	15.0
5. Gross retention	2.4	9.5	42.9	52.7	94.8	97.4	101.6
6. Changes in liabilities	97.6	90.4	57.2	47.3	5.1	2.6	−1.6
Telephones							
7. Dates		1891 [b]–1902 [d]	1903 [b]–1912 [d]	1913 [b]–1920 [d]	1921 [b]–1930 [d]	1931 [b]–1940 [d]	1941 [b]–1950 [d]
8. Gross capital formation		382	905	948	3,708	2,092	7,083
Percentages of Total Uses (Sources)							
9. Gross capital expenditures [e]		87.0	86.5 [f]	96.3	88.6	110.8	93.5
10. Other assets		13.0	13.6 [e]	3.7	11.4	−10.9	6.5
11. Gross retention		6.3	19.6	58.3	43.1	99.8	40.5
12. Changes in liabilities		93.7	80.4	41.7	56.9	0.2	59.5
Electric Light and Power							
13. Dates		1881 [b]–1912 [d]		1913 [b]–1922 [d]		1928 [b]–1937 [d]	1938 [b]–1950 [d]
14. Gross capital formation		1,771		2,067		4,027	10,746
Percentages of Total Uses (Sources)							
15. Gross capital expenditures [e]		89.1 [f]		78.2 [f]		87.4 [f]	97.7
16. Other assets		10.9 [e]		21.8 [e]		12.6 [e]	2.3
17. Gross retention		7.6		15.5		23.6	50.3
18. Changes in liabilities		92.3		84.6		76.4	49.6
Street and Electric Railways							
19. Dates		1890 [a]–1902 [c]	1902 [a]–1912 [d]	1913 [b]–1922 [d]			
20. Gross capital formation		1,134	1,410	1,087			
Percentages of Total Uses (Sources)							
21. Gross capital expenditures [e]		87.4	96.5 [f]	57.1 [f]			
22. Other assets		12.6	3.5 [e]	42.8 [e]			
23. Gross retention		1.4	5.4	13.6			
24. Changes in liabilities		98.7	94.6	86.4			

Because of rounding, detail will not necessarily add to total.
[a] July 1 of year.
[b] January 1 of year.
[c] June 30 of year.
[d] December 31 of year.
[e] Including inventories.
[f] Excluding inventories.

Source: Melville J. Ulmer, *Capital in Transportation, Communications, and Public Utilities: Its Formation and Financing* (Princeton for NBER, 1960), Tables 46–49, pp. 150–153.

calculation indicates that the share of gross retention in total uses for, say, 1901–1910, would be at most 20 per cent for the combined total of the four regulated industries in Table 42; and the corresponding percentage for 1946–1956 would probably not be appreciably smaller than that for 1941–1950 (which works out to about 62).

Thus for these regulated industries there has been a marked upward trend in the ratio of gross retention (internal financing) to all uses of funds over the period (since 1900), during which all corporations and the mining and manufacturing sectors of the corporate group were characterized by only a slight rise in the ratio. The reasons for this trend in the regulated industries have been discussed by Ulmer, and there is no need to enlarge upon them here. The major explanation lies in the sharp slowing down in the rate of growth of these industries for which, in their early extensive growth, capital consumption allowances and income retention were insufficient to finance the needs for rapid expansion of plant and equipment. No such sharp deceleration in the rate of growth of all corporations or of the mining and manufacturing corporations occurred, if only because the historical period covered does not encompass the early phases of these groups, as it does those for the regulated industries.

One technical point, an apparent inconsistency, must be accounted for. How was it possible for one major component of all corporations, the regulated group, to show a significantly rising trend in the ratio of internal financing (gross retention) to total uses, and for all corporations not to show such a large rise in this ratio? The question seems particularly relevant since another big component of all corporations, the mining and manufacturing group, does not show any offsetting decline in the ratio.

The answer lies in the effect of combining groups whose ratios of internal-external financing to total uses differ, and whose weights change over time. A rough calculation will demonstrate the point. Using Table 42 and Ulmer's more detailed tables, we can set total gross capital formation in the four regulated industries for 1901–1912 at about $9.8 billion in current prices; and, if we assume that additions to other assets accounted for another 10 per cent, total uses would amount to roughly $10.8 billion. For 1941–1950 a similar calculation yields gross capital formation of about $25 billion, and an allowance of 7 per cent for changes in other assets brings total uses to about $26.8 billion. In Table 39, total uses for 1901–1912 were $40 billion, and for 1941–1950 they would be about $200 billion (they were $186 billion

for 1940–1949). It follows that the share of total uses for the four regulated industries was 27 per cent in 1901–1912 and only 13.4 per cent in 1941–1950.

Also from Table 42 we can derive the ratio of gross retention to all uses for the four regulated industries—roughly 0.2 in 1901–1912 and 0.62 in 1941–1950. Gross retention in these industries amounted therefore to $2.2 billion in 1901–1912 and to $16.6 billion in 1941–1950. We know from Table 39 that the corresponding ratio for all corporations was 0.55 in 1901–1912 and about 0.70 in 1941–1950 (the latter is high because it includes the World War II period). If we apply these ratios to total uses for all corporations, we secure gross retention of $22 billion and $140 billion, respectively.

We can now subtract total uses and gross retention for the four regulated industries from the corresponding totals for all corporations in order to calculate the ratios for the large nonregulated industries residual. Total uses in the first period (1901–1912) amounted to $29.2 billion, the corresponding gross retention was $19.8 billion, and the ratio was 0.68. In 1941–1950 total uses amounted to $173.2 billion, gross retention to $123.4 billion, and the ratio was 0.71—not very different from the ratio for 1901–1912. The point is that the ratio for all corporations was kept from rising because the relative weight of the nonregulated industries increased from 1901–1912 to 1941–1950. And, because in the recent decades the gross retention-total uses ratio for these industries was generally lower than that for the regulated group, their increasing weight tended to depress the over-all ratio and thus offset the effects of the rise in the ratio for the regulated industries.

This calculation is necessarily crude, and applies to 1941–1950. But if we could repeat it for 1946–1956, we could demonstrate that the rise in the internal financing ratio for these regulated industries in that decade, compared with the pre-World War I period (and perhaps even with the 1920's), was offset by the shift in weight in total uses of funds between the regulated and the other sectors within all corporations, not by offsetting movements in the ratio within the nonregulated industry corporations.

GOVERNMENTS

In the discussion of the financing of governments, we deal with a group of institutions whose pattern in the use of borrowed funds and retained income is radically different from that of the major private sectors of the economy. Governments, particularly the federal, can and

do borrow funds for what may be viewed as current consumption rather than addition to financial assets or real capital formation. This practice may be followed by some private economic units, e.g., households and business firms. But they are obviously a small proportion of the total private sector over any long period, and their borrowing for these purposes is necessarily limited. Unless the use of the borrowed funds improves the economic position of the private unit (returns it to solvency), further borrowing will cease. No such limitations, at least within similarly narrow confines, apply to borrowing by central government authorities. In times of emergency, such as a major war or depression, the governments can and are expected to borrow for defense or counter-depression types of expenditures, neither of which adds to the financial assets or real capital goods in the hands of governments proper—however beneficial the expenditures may be to the rest of the economy. We should, therefore, be prepared to find that in the case of governments the relation between internal funds, borrowing, and total uses of funds, and real capital formation bears no resemblance to that in the private sectors discussed so far.

However, in this respect, at least in this country, state and local governments differ substantially from the federal government, and their financing must be reviewed separately.

State and Local Governments

The relevant data, largely from Goldsmith's work, and extended through 1956 by rough extrapolation based on later sources, are summarized in Table 43.

Internal sources are estimated as the difference between current revenues of the governments and their current expenditures. This difference is the equivalent of funds from internal sources available for replacement of or net additions to real assets, and for net additions to financial assets, provided current expenditures do not include depreciation on already owned and used capital assets—an inclusion not customarily practiced in government accounting.

The trends suggested by Table 43 are distinctive and easily established. By and large, the ratio of internal sources to either total uses or capital outlay rose over the period since the turn of the century. The former ratio moved from 0.53 in 1901–1922 to 0.71 in 1913–1939, and on to 0.79 in 1940–1956. For the shorter periods and with those of war and depression disregarded, the ratio was 0.60 for 1901–1912, 0.68 for 1923–1929, and 0.72 for 1946–1956—the last necessarily a rough ap-

TABLE 43

CAPITAL FORMATION FINANCING, STATE AND LOCAL GOVERNMENTS, 1901–1956
(amounts in billions of dollars)

Periods	Total Uses (Sources) (1)	Capital Outlay (2)	Other Uses (1) − (2) (3)	Internal Sources (4)	Ratio of: (4) to (1) (5)	Ratio of: (4) to (2) (6)
1. 1901–1912	6.0	4.3	1.7	3.6	0.60	0.84
2. 1913–1922	11.9	7.0	4.9	5.9	0.50	0.84
3. 1923–1929	20.2	15.2	5.0	13.7	0.68	0.90
4. 1930–1933	6.6	8.7	−2.1	4.0	0.61	0.46
5. 1934–1939	14.6	9.9	4.7	14.3	0.98	1.44
6. 1940–1945	20.9	7.9	13.0	24.5	1.17	3.10
7. 1946–1949	22.4	14.3	8.1	16.4	0.73	1.15
8. 1950–1952	32.2	20.0	12.2	24.0	0.75	1.20
9. 1953–1956	60.5	37.8	22.7	42.8	0.71	1.13
Longer Periods						
10. 1901–1922	17.9	11.3	6.6	9.5	0.53	0.84
11. 1913–1939	53.3	40.8	12.5	37.9	0.71	0.93
12. 1940–1956	136.0	80.0	56.0	107.7	0.79	1.35
13. 1946–1956	115.1	72.1	43.0	83.2	0.72	1.15

SOURCE, BY LINE

Lines 1–6. Raymond W. Goldsmith, *Financial Intermediaries*, Table 74, p. 260.

Lines 7 and 8. Daniel H. Brill, "Financing of Capital Formation," *Problems of Capital Formation* (Studies in Income and Wealth, Vol. 19, Princeton for NBER, 1957), Table 11, p. 171.

Line 9. Capital outlay extrapolated from lines 7 and 8 by applying to state and local construction for 1953–1956 (*Economic Report of the President*, January 1957, Table E-30, p. 156) the ratio of capital outlay to that series for the earlier periods (the ratio assumed was 1.05). Likewise, total sources were estimated on the basis of the ratio to capital outlay (the latter was 1.61 for 1950–1952, and was set at 1.6 for 1953–1956). Finally, external sources were estimated for the recent period on the basis of the ratio of state and local government securities offered to net borrowing (for the series see *ibid.*, Table E-55, p. 184, and Table E-44, p. 173). This ratio, which was 1.36 for 1950–1952, was set at 1.35 for 1953–1956.

proximation. The ratio of internal funds to capital outlay shows an even greater upward trend: it rose from 0.84 in 1901–1922 to 0.93 in 1913–1939, and to 1.35 in 1940–1956. For the shorter periods it moved from 0.84 in 1901–1912 to 0.90 in 1923–1929, and to 1.15 in 1946–1956.

The movement of the ratio of internal funds to capital outlay (but not to total uses) can be observed for local and for state governments

separately. This distinction suggests that the rise observed in Table 43 is due partly to an upward movement in the ratio within local governments, but even more to the greater relative rise of capital outlay and of gross savings by state governments than of those by local governments. Because in recent periods, specifically since 1934, the ratio of gross savings to capital outlay has been distinctly higher for state than for local governments, the rise in the relative weight of the former imparts an upward trend to the ratios in Table 43. It will be observed in this connection that the rise in column 6 is particularly sharp beginning with 1934–1939.

The ultimate explanation of these trends lies in the movement of gross savings and of capital outlay at the two levels of government. Apparently both, but particularly state, governments have managed since the late 1930's to tap sources of revenue increasingly in excess of current expenditures, enabling them to finance a greater proportion of capital outlay without additional borrowing. Exploration of the factors behind that trend would call for examination of the sources of current revenue in their relation to the needs for current expenditures as distinct from the needs for capital outlay. For instance, has such a major source of local government current revenues as taxes on real estate grown more rapidly in recent decades than have the current expenditures generated by the real estate tax base, and has this difference between current revenues and expenditures, that represents gross savings, made possible an increasing proportion of capital outlay financing without resort to new borrowing? Likewise, has such a major source of current revenues of state governments as the gasoline tax, for example, increased more rapidly than have the current expenditures connected with the expanded use of the automobile, with the excess contributing to a larger share of internal financing of capital outlay by the states? The answers to these questions would require a detailed examination of the major sources of current revenues, and an analysis that would link the factors responsible for trends in current revenues with those responsible for trends in current expenditures and in the needed capital outlay. Such an analysis is, unfortunately, beyond the scope of the present study.

The Federal Government

It is at the federal level that the peculiar pattern of government financing stands out most clearly (Table 44). Total uses here mean the additions to real capital goods (gross) in the hands of the govern-

TABLE 44

CAPITAL FORMATION FINANCING, THE FEDERAL GOVERNMENT, 1901–1955
(billions of dollars)

Periods	*Total Uses*		*Real Capital Formation*		Borrowing	*Internal Funds*	
	Excluding Military	Including Durable Military	Excluding Military	Including Durable Military		Excluding Military	Including Military
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1. 1901–1912	1.8	1.8	0.94	0.94	0.8	1.0	1.0
2. 1913–1922	5.8	15.0	0.93	10.13	24.7	−18.9	−9.7
3. 1923–1929	1.7	2.6	0.76	1.7	−6.0	7.8	8.7
4. 1930–1933	3.7	4.7	1.29	2.3	7.8	−4.2	−3.2
5. 1934–1939	24.5	27.4	5.1	8.0	37.1	−12.6	−9.7
6. 1940–1945	55.5	128.7	11.7	84.9	240.6	−185.1	−111.9
7. 1946–1949	−9.6	0.3	4.1	14.0	−19.6	9.9	19.8
8. 1946–1955			15.6	70.8	2.0		
Longer Periods							
9. 1901–1922	7.6	16.8	1.9	11.1	25.5	−17.9	−8.7
10. 1923–1939	29.9	34.7	7.2	12.0	38.9	−9.0	−4.2
11. 1940–1949	45.9	129.0	15.8	98.9	221.0	−175.2	−92.1
12. 1940–1955			27.3	155.7	242.6		

SOURCE, BY LINE

1–7. Raymond W. Goldsmith, *Financial Intermediaries*, Table 76, p. 266. For military, see text.
8. By extrapolation as follows:
Col. 3. Based on volume of nonmilitary construction ($14.7 billion for 1950–1955, see *Economic Report of the President*, January 1957, Table E-30), plus $2.0 billion for 1950–1955 for other capital goods, based on the 1946–1949 average volume.
Col. 4. See Table 14, where military capital formation is $55.2 billion.
Col. 5. Based on gross public debt of $278.7 billion at end of 1945, and $280.8 billion at end of 1955 (see *Economic Report of the President*, January 1957, Table E-45).

ment plus net additions to its financial claims. Goldsmith, from whose estimates Table 44 was derived, does not include either military construction or durable munitions among real capital goods, and this concept is reflected in column 1. By including our estimates of the gross additions of durable military goods (used in the corresponding variants in Chapters 3 and 4) we secure the more comprehensive entries in column 2.

Real capital formation represents, then, gross additions to durable goods and net additions to inventories, whenever the latter can be

measured. Here again we can either exclude the gross volume of military construction and durable munitions (column 3) or include it (column 4).

The entries for net borrowing are independent of the others, in the sense that they are derived from data on debt outstanding, adjusted, when necessary, to a net basis with respect to the other sectors of the economy. Gross retention or internal funds as shown in columns 6 and 7 are residuals, derived by subtracting net borrowing (column 5) from total uses (column 1 or 2). Consequently, we have two variants of gross retention: one that treats durable military goods as capital assets (column 7); and another that treats them as current expenditures (column 6).

Whichever treatment is adopted, the federal government, over any long period that covers either a war or a major depression, borrows much more than is needed for additions to its assets. In such a period it borrows not only to finance asset acquisition but also to finance current expenditures. The entries in columns 6 and 7 for all the long periods (lines 9–11) are negative; and there is little question that the entries for 1940–1955, if we could have calculated them, would have been negative.

The reasons why the federal government resorts to borrowing rather than to taxation in periods of economic or military emergency are discussed at length in Copeland's monograph,[22] and need not be repeated here. One important element is the difference between the slowness inherent in the revenue collecting system and the speed with which current expenditures have to be expanded in an emergency. Another is public resistance, once the emergency is over, to continuance of the revenue collecting system in the high gear required not only to meet the greater burden of current expenditures but also to reduce appreciably the already established debt. Whatever the reasons, the results are clear: the federal government of this country, like the central governments of many other countries, has financed out of external funds, not merely additions to assets, but also current expenditures. In any true sense, the ratio of external financing to capital formation of the federal government is sharply upward when we compare the first half of the period since 1900—including World War I—with the second half, including the depression, World War II, and the cold war that has characterized the recent years.

[22] Morris A. Copeland, *Trends in Government Financing* (Princeton for NBER, 1961).

An Attempt at a Summary

Having reviewed the long-term movement in shares of internal and external sources of financing for the several sectors of the economy, we should combine the results in a summary for the economy as a whole. Several difficulties stand in the way. First, the data for the sectors do not cover the same periods, and some do not extend through 1950–1955 (or 1956). Second, we must decide on the form of the comparison of sources or uses, and not all the latter are available for the specific sectors. Finally, for some sectors, such as households, we may want to limit the concept of uses of funds more than for others, and the definition of sources may also differ among sectors.

Table 45 represents an effort to overcome these difficulties in order to secure a countrywide picture. The notes to the table contain a brief account of the statistical manipulations and short-cuts resorted to. More important is the fact that some lack of comparability remains—chiefly between the business sector (agriculture, nonfarm unincorporated business, and corporate business) where the sum of capital consumption allowances and undistributed profits is taken to represent internal sources, and households (represented by nonfarm residential construction) where no such assumption is made. Another source of discrepancy lies in the fact that gross retention of income in the case of governments, while analogous to that in the business sector with respect to accounting procedures, can hardly have the same meaning. All of these dissimilarities reflect the basic characteristics of the major segments of the economy, and in any attempt to bring those segments together some artificial element in the common conceptual structure imposed on them is inevitable.

In Table 45, gross capital formation is compared with gross retention or internal sources. Neither is adjusted for the effects of changes in inventory valuation or for the difference between original cost base and reproduction cost base of capital depreciation allowances. The main question is: did the ratio of gross retention to total real capital formation for the economy as a whole show any distinct trend?

We start with the business sector—agriculture, nonfarm unincorporated business, and all corporations (lines 7–9). For the discrete, relatively normal periods—the first decade of the century, the 1920's, and the post-World War II decade (columns 1, 3, and 6)—the ratio of internal funds to gross real capital formation was 0.82, 0.85, and 0.90,

TABLE 45

SUMMARY: RATIO OF GROSS RETENTION (INTERNAL FUNDS) TO GROSS CAPITAL FORMATION, BY CATEGORY OF USER, 1900–1956
(amounts in billions of dollars, averages per year)

Category of User	*Periods*						*Longer Periods*				
	1900–09 or 1901–10 (1)	1910–19 or 1911–20 (2)	1920–29 or 1921–30 (3)	1930–39 or 1931–40 (4)	1940–44 or 1940–45 or 1941–45 (5)	1945–55 or 1946–56 (6)	1900–19 or 1901–20 (7)	1920–39 or 1921–40 (8)	1940–55 or 1941–56 (9)	1900–29 or 1901–30 (10)	1930–55 or 1931–56 (11)
Agriculture											
1. Gross capital formation	0.89	1.48	1.16	0.91	1.98	4.27	1.18	1.04	3.51	1.18	2.47
2. Gross retention	0.71	1.04	0.65	0.94	4.54	4.16	0.88	0.80	4.29	0.80	2.95
Nonfarm Unincorporated Business											
3. Gross capital formation	0.35	0.71	1.62	0.56	1.26	3.60	0.53	1.09	2.82	0.89	1.92
4. Gross retention	0.27	0.75	1.26	0.52	4.08	2.53	0.51	0.89	3.05	0.76	2.04
Corporations											
5. Gross capital formation	2.05	4.44	6.35	3.13	6.82	24.7	3.24	4.74	18.74	4.28	12.50
6. Gross retention	1.73	4.10	5.82	3.23	10.08	22.6	2.92	4.52	18.43	3.88	12.35
Total Business											
7. Gross capital formation, lines 1, 3, and 5	3.29	6.63	9.13	4.60	10.06	32.57	4.96	6.86	25.07	6.35	16.89
8. Gross retention, lines 2, 4, and 6	2.71	5.89	7.73	4.69	18.70	29.29	4.30	6.21	25.77	5.44	17.34
9. Ratio, line 8 to line 7	0.82	0.89	0.85	1.02	1.86	0.90	0.87	0.91	1.03	0.86	1.03

Households [a]											
10. Gross capital formation	1.22	1.34	4.55	1.42	1.47	10.55	1.28	2.98	7.52	2.37	5.08
11. Internal sources	0.79	0.69	1.68	0.56	0.38	2.85	0.74	1.12	2.03	1.05	1.44
Total Private											
12. Gross capital formation, lines 7 and 10	4.51	7.97	13.68	6.02	11.53	43.12	6.24	9.85	32.59	8.72	21.97
13. Gross retention, lines 8 and 11	3.50	6.58	9.41	5.25	19.08	32.14	5.04	7.33	27.80	6.50	18.78
14. Ratio, line 13 to line 12	0.78	0.83	0.69	0.87	1.65	0.75	0.81	0.74	0.85	0.75	0.85
State and Local Governments											
15. Gross capital formation	0.30	0.53	1.84	1.86	1.32	6.55	0.42	1.85	4.81	0.89	3.63
16. Gross retention	0.20	0.40	1.42	1.83	4.08	7.56	0.30	1.62	6.40	0.67	4.57
Private plus State and Local Governments											
17. Gross capital formation, lines 12 and 15	4.81	8.50	15.52	7.88	12.85	49.67	6.66	11.70	37.40	9.61	25.60
18. Gross retention, lines 13 and 16	3.70	6.98	10.83	7.08	23.16	39.70	5.34	8.96	34.20	7.17	23.35
19. Ratio, line 18 to line 17	0.77	0.82	0.70	0.90	1.80	0.80	0.80	0.77	0.91	0.75	0.91
Federal Government											
20. Gross capital formation (excluding military)	0.07	0.11	0.09	0.64	1.95	1.56	0.09	0.36	1.69	0.09	1.27
21. Gross retention	0.10	−1.8	1.0	−1.68	−30.85	0	−0.85	−0.34	−10.28	−0.23	−6.84
Total including Federal Government											
22. Gross capital formation, lines 17 and 20	4.88	8.61	15.61	8.52	14.80	51.23	6.74	12.06	39.09	9.70	26.87
23. Gross retention, lines 18 and 21	3.80	5.18	11.83	5.40	−7.69	39.70	4.49	8.62	23.92	6.94	16.51
24. Ratio, line 23 to line 22	0.78	0.60	0.76	0.63	—	0.77	0.67	0.71	0.61	0.72	0.61

[a] Nonfarm residential construction. (Notes on following page)

NOTES TO TABLE 45

SOURCE: Where the preceding tables cover the period through 1955 or 1956, there was no problem in bringing the estimates through that date. Also, even when the periods distinguished are different from those shown in the preceding tables (e.g. for nonfarm unincorporated business), the new totals could be calculated from the sources cited earlier.

The following additional estimates had to be made:

For nonfarm unincorporated business, we assumed that the movement from 1945–1949 to 1950–1955, in gross capital formation, in additions to other assets, and in the proportion of borrowing to total uses, was the same as for agriculture (in Table 35). This permitted us to bring the series for this sector through 1955.

For households, the estimates had to be extended back to 1901–1910. Expenditures on nonfarm housekeeping residential construction are available for that period in Grebler, Blank, and Winnick, *Capital Formation in Residential Real Estate*, Table B-3, p. 335. To them we added 33 per cent for the cost of land (see *ibid.*, Table M-1, p. 455, for the ratios used in 1911 and later years). We assumed that the percentage of external financing was 35 at most (it was less than 50 in 1911–1920), in view of the much lower ratio of debt to value in owner-occupied housing in the earlier of the two decades.

For the federal government we assumed that during 1946–1955 there was practically no retention. The small positive total for 1946–1949 ($9.9 billion) appeared to be offset by the cumulation of the deficits that followed.

The absolute values in columns 7 to 11 are arithmetic means of the entries in columns 1 to 6. Those in columns 7, 8, and 10 are unweighted; for columns 9 and 11, the entries in column 5 are given half weight. The ratios are derived directly from the absolute values, and are not arithmetic means of the ratios in columns 1 to 6.

respectively, showing a mild rise. For the three long periods, including major wars and depressions (columns 7 to 9), the ratio was 0.87, 0.91, and 1.03, respectively, showing a distinct rise. Finally, for the two long periods (columns 10 and 11), the ratio was 0.86 and 1.03, respectively, again a marked upward movement.

Then we add nonfarm residential construction to form the total private sector (lines 12 to 14). Adding it either cancels or reduces the rise in the ratio of internal funds to capital formation, for the simple reason that the ratio of internal funds to capital formation for households declined over time. For the three relatively short normal periods, the ratio was 0.78, 0.69, and 0.75, respectively—no evidence of either an upward or downward trend. For the three long periods, the ratio was 0.81, 0.74, and 0.85, respectively, a mild rise. Finally, for the two long periods, the ratio was 0.75 and 0.85, respectively, a distinct rise.

We next include state and local governments, and because that subsector is marked by a rather high and rising ratio of internal financing to gross capital formation, the new totals (lines 17 to 19) again suggest an upward movement in the ratio, especially for the longer periods. But without dwelling too long on this hybrid combination

of the private sector with state and local governments, we pass to the comprehensive countrywide total, which includes also the federal government. Here there is a definite indication of constancy or slight downdrift in the ratio of internal funds to total gross real capital formation (line 24). The ratio moved from 0.78 in the first decade to 0.76 in the 1920's, then to 0.77 in 1946–1955. When we use longer periods, including wars and major depressions, the decline becomes more perceptible: the ratio rose slightly from 0.67 in the first two decades of the century, to 0.71 in the next two decades, and then dropped to 0.61 in the last decade and a half. For the two long subperiods of the full period, the ratio was 0.72 and 0.61, respectively. Thus, for the economy as a whole, the ratio of internal funds to gross real capital formation was either constant or declined, which means that the ratio of borrowing to gross real capital formation was either constant or increased.

Before we consider the significance of these findings, it may be well to compare internal funds or gross retention with total uses of funds rather than with gross real capital formation alone (Table 46). In the case of households we assume that new nonfarm residential construction represents total uses of funds. To treat it otherwise would necessitate consideration of the accumulation of cash and other financial assets by households, which would in turn call for distinguishing between households as investors in dwellings and households as the largest body of ultimate savers and spenders in the economy.

The results in Table 46 are not much different from those in Table 45, whatever differences there are being due to the greater weight of the business sector here, with its higher ratio of changes in financial assets to real capital formation. In the business sector proper, the ratio of internal funds to total uses (line 6) rose slightly, from 0.59 in each of the first three decades in the century to 0.64 in the post-World War II decade. The longer period averages in columns 7 to 9 and 10 to 11 confirm that upward trend. The inclusion of nonfarm residential construction eliminates or reduces the upward trend in the ratio of internal funds to total uses, as it reduces the ratio in Table 45. But while the movement in the ratio for the total private sector shows a decline if discrete periods are used—the ratio moving from 0.61 in column 1, to 0.53 in column 3, to 0.57 in column 6—we observe a rise in the ratio when wars and depressions are included—from 0.59 in the first two decades (column 7) to 0.62 in the last one and a half decades (column 9), or from 0.56 to 0.64 (columns 10 and 11).

TABLE 46

SUMMARY: RATIO OF GROSS RETENTION (INTERNAL FUNDS) TO TOTAL USES-SOURCES OF FUNDS, BY CATEGORY OF USER, 1900–1956
(amounts in billions of dollars, averages per year)

Category of User	*Periods* 1900–09 or 1901–10 (1)	1910–19 or 1911–20 (2)	1920–29 or 1921–30 (3)	1930–39 or 1931–40 (4)	1940–44 or 1940–45 or 1941–45 (5)	1945–55 or 1946–56 (6)	*Longer Periods* 1900–19 or 1901–20 (7)	1920–39 or 1921–40 (8)	1940–55 or 1941–56 (9)	1900–29 or 1901–30 (10)	1930–55 or 1931–56 (11)
Total Business											
1. Total uses, agriculture	0.98	2.01	0.99	1.04	4.14	5.01	1.50	1.02	4.72	1.33	3.25
2. Total uses, nonfarm unincorporated business	0.43	1.13	1.61	0.19	4.13	4.04	0.78	0.90	4.07	1.06	2.52
3. Total uses, corporations	3.15	6.83	10.58	2.83	12.57	36.92	4.99	6.70	28.80	6.85	18.41
4. Total uses, lines 1 to 3	4.56	9.97	13.18	4.06	20.84	45.97	7.26	8.62	37.59	9.24	24.18
5. Gross retention [a]	2.71	5.89	7.73	4.69	18.70	29.29	4.30	6.21	25.77	5.44	17.34
6. Ratio, line 5 to line 4	0.59	0.59	0.59	1.16	0.90	0.64	0.59	0.72	0.69	0.59	0.72
Total Private											
7. Total uses, line 4 plus households [b]	5.78	11.31	17.73	5.48	22.31	56.52	8.54	11.60	45.11	11.61	29.26
8. Gross retention [a]	3.50	6.58	9.41	5.25	19.08	32.14	5.04	7.33	27.80	6.50	18.78
9. Ratio, line 8 to line 7	0.61	0.58	0.53	0.96	0.86	0.57	0.59	0.63	0.62	0.56	0.64
State and Local Governments											
10. Total uses	0.43	0.88	2.52	2.12	3.48	10.46	0.66	2.32	8.13	1.28	5.73
Private plus State and Local Governments											
11. Total uses, lines 7 and 10	6.21	12.19	20.25	7.60	25.79	66.98	9.20	13.92	53.24	12.88	34.99
12. Gross retention [a]	3.70	6.98	10.83	7.08	23.16	39.70	5.34	8.96	34.20	7.17	23.35
13. Ratio, line 12 to line 11	0.60	0.57	0.53	0.93	0.90	0.59	0.58	0.64	0.64	0.56	0.67
Federal Government											
14. Total uses	0.13	0.55	0.20	2.82	9.25	3.47	0.34	1.51	5.40	0.29	4.37
Total Including Federal Government											
15. Total uses, lines 11 and 14	6.34	12.74	20.45	10.42	35.04	70.45	9.54	15.44	58.64	13.18	39.36
16. Gross retention [a]	3.80	5.18	11.83	5.40	−7.69	39.70	4.49	8.62	23.92	6.94	16.51
17. Ratio, line 16 to line 15	0.60	0.41	0.58	0.52	—	0.56	0.47	0.56	0.41	0.53	0.42

[a] From Table 45. [b] Nonfarm residential construction, only.

NOTES TO TABLE 46

SOURCE: For nonfarm unincorporated business, we had to return to the original data in Goldsmith's *A Study of Saving*, because of differences between the periods in Table 36 and in the present table.

Because the periods in Tables 39, 43, and 44 for corporations, state and local governments, and the federal government, differ from those here, we computed the ratios of gross real capital formation to total uses for the periods in the earlier tables, and adjusted them roughly to correspond with the periods in the present table. Whereas for corporations they were 0.652 for 1901–1912, 0.649 for 1913–1922, and 0.593 for 1923–1929 (Table 39), we assumed 0.65 for 1900–1909, 0.65 for 1910–1919, and 0.60 for 1920–1929. For state and local governments, the three early periods in Table 43 yielded ratios of 0.72, 0.59, and 0.75; our estimates for the first three decades were 0.7, 0.6, and 0.73. For the federal government the ratios for the three early periods were 0.52, 0.16, and 0.45, respectively (Table 44, excluding military); we assumed those for the first three decades to be 0.52, 0.20, and 0.45, respectively. For 1946–1955 we assumed that the ratio of gross real capital formation to total uses was 0.45—the ratio that characterized the more "normal" span of 1921–1930.

With these ratios at hand, we could derive the estimated volumes of total uses from the volumes of gross capital formation in Table 45.

The absolute values and ratios in columns 7 to 11 were calculated in the manner described for Table 45.

The most interesting result is for the economy as a whole, i.e., for the private and public sectors combined (line 17). Here the discrete periods which skip the major wars and depressions show a slight decline; the ratio is 0.60 in column 1, 0.58 in column 3, and 0.56 in column 6. For the longer periods including wars and the depression of the 1930's, the ratio shows a somewhat more marked decline—from 0.47 in column 7 to 0.41 in column 9. And it moves from 0.53 in column 10 to 0.42 in column 11. It can thus be said, in general, that in the business sector we have an indication of an upward movement of the ratio of internal funds to either gross capital formation or to total uses; that in the private sector we have, on the whole, a slight decline on the basis of normal periods, and a rise if all periods are considered; and that in the economy as a whole we have a decline.

In the household sector and governments, especially the federal, the ratio of internal funds to either real capital formation or to total uses (narrowly defined) has declined significantly. It should be noted that in both Tables 45 and 46, government capital formation and total uses exclude durable military goods. Households had recourse to borrowing that constituted an increasing proportion of the value of the new dwellings they were buying or constructing. Governments, representing society as a whole, were borrowing increasingly for purposes that, at least in Tables 45 and 46, appear neither as gross capital formation nor as additions to financial assets (of the governments).

Within the business sector, however, the trend in the ratio of internal funds to uses was in the opposite direction. Obviously, the trend in any total depends upon the comprehensiveness of the total, the differences in the trends of its components, and the weights of the latter.

Two final observations should be made. First, we repeat the warning expressed in the first section of this chapter to the effect that aggregates of the type we had to use may conceal considerable financing external to each business unit, and hence exaggerate the relative share of internal funds in capital formation or in total uses. This is particularly true of large aggregates like all corporations; and it is not safe to conclude from the rise in the ratio of internal funds to uses, in Table 45 or Table 46, for this group or for the whole business sector that the dependence upon borrowing has decreased. As suggested earlier, increasing diversity in the use by corporations of their capital consumption allowances or of their net profits, may have meant greater concealment within aggregated totals of demands for external funds. On the other hand, the higher proportion of large corporations may have meant reduction in diversity of experience and a trend toward increased importance of internal funds far greater than is suggested by the ratios computed above. In short, the measures reflect only part of the process, and whatever trends they reveal are those at only one level of the process.

Second, there are obvious interrelations between the trends observed in the three sectors—business, household, and government. Indeed, at the risk of exaggerating, one can say that the upward trend in the ratio of internal funds to either capital formation or total uses in the business sector was associated with the downward trend of the ratios in the government and household sectors. It was government expenditures during the war and after, and the factors that determined them, that allowed (indeed, during the war years, actually forced) business units to follow a gross retention policy that yielded a very high ratio of internal funds to total uses. It was the sustention of consumer demand by the willingness of consumers to finance their purchases by borrowing that set the conditions for prosperity and favorable conditions in the business sector, permitting business units to earn both their capital consumption allowances and substantial retained profits, and to maintain a high ratio of internal funds to total uses, even when total uses were rising rapidly. These interrelations among the sectors are evidence of a mechanism that makes for stability

in the countrywide ratio. This stability is not mechanically or inevitably assured; but the countrywide ratio of internal funds (and hence, of borrowing) to total real capital formation or to total uses (properly defined) is most likely to show a much less conspicuous trend than would the ratios for the subsectors of the economy.